Petrographic analysis of Gyűrűfű Rhyolite Formation using the thin section collection of MecsekOre Company

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In this study the samples of the „Vulkanitok, etalon kollekció" thin section collection (MecsekOre Ltd.) were examined, representing the Permian Gyűrűfű Rhyolite Formation (selected boreholes and outcrops, W Mecsek Mts.; core Bisse–1, northern foreland of Villány Mts.) and Cserdi Conglomerate Formation (boreholes and outcrops, W Mecsek Mts.).

The Permian Gyűrűfű Rhyolite and Cserdi Conglomerate Formations occurs in the Mecsek Mts and surrounding areas – within South-Transdanubian Unit -, where during the Variscan orogen cycle formed basin sedimented in thick molass layers. The Gyűrűfű Rhyolite Formation in the W-Mecsek was documented like rhyolitic rock "quartzphorphyr", which subordinated set between the bedrock (Korpádi Sandstone) and the covering (Cserdi Conglomerate) Formations (Fazekas, 1978; Fülöp, 1994; Barabás & Barabásné Stuhl, 1998).

In this study the used samples are from by Via Fazekas assembled etalon thin section collection. During the reambulation we observed special marks which help to microscophically distinguish the old, transformed volcanic rocks from the magmatic explosive and pyroclast flow origin rocks (McPhie *et al*., 1993; Paulick & Breitkreuz, 2005).

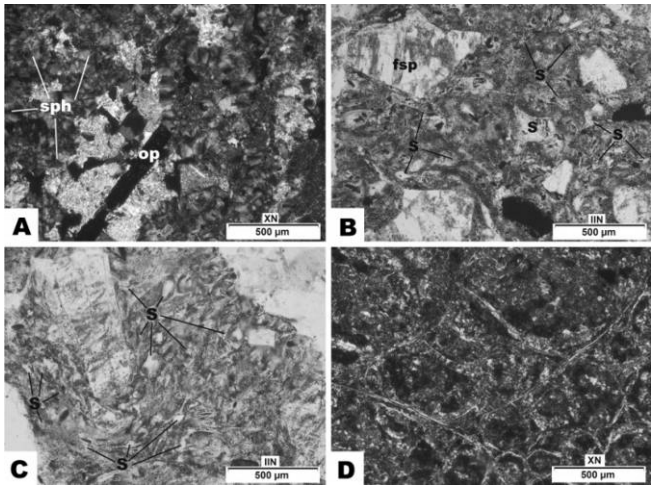

Fig-1: **A)** Spherulites (S) and opac pseudomorphs (op) in devitrificated pumice **B)** Matrix with abundant feldspar crystal fragments (fsp) and devitrificated glass shards **C)** Glass shard-rich (S) relict vitroclaltic textures clast **D)** Relict perlitic structure

In the descriptions about the Gyűrűfű Rhyolites were determined like quartzphorphyr with microcrsytal felsitic texture. Supposedly, that the groundmass was once glassy and silificied. In the felsitic matrix it could appear as a flowing structure which was identified by tear or lobe shaped forms (Fazekas, 1978; Barabás & Barabásné Stuhl, 1998).

In my observation these structures are relict pumices and glass shards (Fig. 1/B). The strongly transformed, discontinuous, interrupted patterns are typical vitroclastic marks in pyroclastics. The relict glass shards, which once formed the volcanic glass, had changed (recrystallization, silicification and argillitization). The shape of the relict pumices and glass shards depend on the volume of the welding. The evidence of the welding, high-temparature devitrification and compaction are the emergence of the spherulitic-axiolitic patterns and the deformated, elongated-flattened frequent appearance of glass shards. Build of potassium feldspar spherulites generally appear in the middle of the pumices and shards while the axiolites occur in the margins (Fig. 1/A). Inside the pumices microquartz or mosaitic macroquartz were crystallised. Based on the abundant appearence of broken, splintery phenocrystals and microphenocrystals probably they are magmatic explosive, pyroclastic flow origin rocks. The texture of the Gyűrűfű Rhyolite samples are mainly recrystallised, phorphyric and the groundmass are relict vitroclastic.

The Cserdi Conglomerate samples contain framework volcanic rock fragments with felsitic and pumice origin altered relict vitrophyric-vitroclastic textures. The texture of the relict vitroclastic grains (Fig. 1/C) is highly similar to the characteristic patterns of the rocks of the Gyűrűfű Rhyolite Formation, however the felsic grains do not occur in the samples from W-Mecsek. The relict vitroclatic clasts are abundant in spherulitic and axiolitic pumices or pumice fragments/shards. The shards usually have blade-like shape, but typical are the cuspate or platty shapes as well (Fig. 1/C). Characteristic patterns are the „tubes" in pumices which are the former space of migrating volatiles.

Volcanic texture of the specimens from the core Bisse–1 can be classified as altered homogenous phorphyric perlitic one where the groundmass is devitrificated (Fig. 1/D). The devitrification could take place under low-temperature and the former glass transformed to phyllosilicates and quarts. It can develop both in flow rhyolites and pyroclastits (McPhie *et al*., 1993; Szepesi, 2007).

My results confirm the hypothesis that the rocks of the Gyűrűfű Rhyolite are at least partially derived from magmatic explosive pyroclastic flows. Probably when the Cserdi Formation started to accumulate, this process did not stop, but volcanosediment layers were contemporarily deposited.

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