SHALLOW SUBVOLCANIC ANDESITIC MAGMATISM IN THE EAST BORSOD BASIN, HUNGARY: AN EXAMPLE OF MAGMA/WET SEDIMENT INTERACTION

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Already from the 1970s but mainly from the 1990s many authors published examples where magma comes in contact with wet sediment, generating hyaloclastites, peperites, in-situ breccias, etc. (LYDON, 1968; YAMAGISHI, 1991; HANSON & HARGROVE, 1999). These works make it clear that phenomena of magma/wet sediment interactions are common in geological environments where thick sediment sequences accumulate during active volcanism. Miocene palaeogeographic environment (HÁMOR, 2001) and neutral volcanism of the East Borsod Basin allowed the formation of different types of these rocks.

The East Borsod Basin (EBB) is mainly built up from Cenozoic sequences. Paleo-Mesozoic rocks, represented mostly by limestones, siliceous shales and derived volcanoclastics, cover small areas. The greater part of EBB is covered by Cenozoic clastic sediments, volcanic-subvolcanic rocks, pyroclastic and volcaniclastic deposits, and the Paleo-Mesozoic basement is situated within a few hundred meters below the surface.

The Lower and Middle Miocene (Ottnangian-Karpatian) sequences (Salgótarján Lignite Formation – SLF) are represented by sandstones, aleurolitic sandstones, argilliferous aleurolites, clays and redeposited acidic tuffs with intercalated coal seams. These sediments were deposited in shallow marine and near-shore environments.

The Upper Badenian–Sarmatian–Pannonian sequences building up the Sajóvölgy Formation (SF) are deposited with unconformity on the SLF. These sediments were deposited in fluvial, deltaic or near-shore environments. The upper part of the formation consists mainly of cross-bedded medium- or coarse-grained sands, polymict gravels or conglomerates; the lower part contains shallow marine–offshore tuffites and sands. Sediments of the SF are unconsolidated or poorly consolidated, therefore, erosional valleys and canyons are barely found, while derasional and erosional-derasional valleys are more abundant.

Interbedded Sarmatian–Pannonian andesitic pyroclasts and volcanic-subvolcanic rocks are present in patches on the surface, because most of them are covered by younger deposits. Their characteristics, habits and facies could be interpreted as a separate volcanic formation (Dubicsány Andesite Formation – DAF) formed by pyroclastic tuff-breccias, lapilli-tuffs, and shallow subvolcanic intrusions, dikes, *in situ* breccias and hyaloclasts. The age of the neutral volcanic activity in the EBB ranges from 9.5 ± 0.8 to 13.73 ± 0.76 Ma (Upper Badenian–Sarmatian–Pannonian) according to K/Ar radiometric data.

Epiclastic tuff-breccias and lapilli-tuffs are drab or grey, poorly bedded or unbedded, with tuffaceous matrix, and consist of andesite blocks, fragments and epiclasts of various size. By the major element composition of the andesite blocks, they belong to the calc-alcaline series; the range of contents of SiO_2 and K_2O varies between 56.85–58.22 wt% and 1.86–2.10 wt%, respectively. These rocks are highly porphyritic with phenocrysts mainly consisting of plagioclase, orthopyroxene (ferrosilite), clinopyroxene (augite). The groundmass of andesite blocks is felsitic containing mineral assemblage of plagioclase, orthopyroxene, clinopyroxene, magnetite and titanomagnetite. The texture is micro-holocrystalline-porphyritic or pilotaxitic.

Andesite intrusions and dykes are small (max. 15 m in diameter), and often show columnar, slab jointing or coarse blocked structure (CSÁMER & NÉMETH, 2000). Their chemical and mineralogical composition is similar to that of the pyroclastic andesite blocks. Andesite intrusions were emplaced into wet unconsolidated sediments during or shortly after their deposition. The host sediment is dominantly lapilli-tuff, tuff-breccia. On the margins of the intrusions aureole and hyaloclastite occur containing angular or partly rounded andesite fragments of varying quantity in a tuffaceous matrix. Beside the regular chaotic texture (cluster of angular andesite fragments), jigsaw-fit texture can be also recognized recording *in situ* fragmentation.

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