Mid-conference fieldtrip: Walk to the Úhošť hill

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During the mid-conference field trip, Úhošť hill table mountain will be visited (Fig. 1). The Úhošť Hill is a typical example of accumulation of basaltic lavas in the Doupovské hory volcanic complex. Nine lava flows were identified through a detailed research (Fig. 2), with thickness usually not exceeding 5 m (except for the thick youngest lava). Most lavas are coated with autoclastic breccia, which was formerly erroneously interpreted as a pyroclastic deposits and the Úhošť hill profile as an example of stratovolcanic structure applied to the entire DHVC.

The autoclastic breccias coating individual lava flows exposed on the Úhošť hill are clast-supported and monomictic consisting solely of fragments of related lavas. The interclast voids remain empty or can be later filled with younger sedimentary or pyroclastic material, or with post-magmatic calcite.

The observed rocks belong to two alternating independent suites (Rapprich and Holub 2008). The first suite comprises nephelinite, tephrite, basanite and picrobasalt (flows 1, 2, 3, 5 and 6; Fig. 2) with "dry" mineral assemblage. The picrobasalts (Fig. 3) represent a semicumulitic rock enriched in clinopyroxene and olivine phenocrysts derived from basanites. This suite therefore represents continuous exhausting of a zoned magma chamber with melts depleted in phenocrysts (nephelinite and tephrite) erupted first and the magma enriched in phenocrysts erupted as the last. This suite has uniform isotopic composition ($^{87}Sr/^{86}Sr_i$ = 0.70409–0.70418, $^{143}Nd/^{144}Nd_i$ = 0.51270–0.51271), with a more depleted geochemical signature of the source mantle.

The second suite consists of alkali basalts that contain pseudomorphs after amphibole (Fig. 4), not present in the tephrite–basanite–picrobasalt suite. The basalts of the alkali basalt suite are higher in silica and aluminium and also their isotopic signature differs significantly ($^{87}Sr/^{86}Sr_i$ = 0.70452–0.70459, $^{143}Nd/^{144}Nd_i$ = 0.512661–0.512665; Rapprich and Holub 2008).

The two observed suites erupted alternating each other, with tephrites and basanites of the "dry suite" followed by basalts of the "amphibole-bearing suite", picrobasalts of the "dry suite" and again basalts of the "amphibole-bearing suite" (Fig. 5). The observed geochemical evolution in the sequence of the Úhošť hill lavas cannot be explained in terms of simple magma evolution or exhausting of a stratified magma chamber. These data are interpreted to reflect distinctive sources which gave rise to the chemical variability of the erupted magmas. Synchronous alternating activity of magmas from different sources was also documented in the intrusive system in the central part of the DHVC (Holub et al. 2010). The K/Ar geochronology dates the activity of the Úhošť hill lavas to a time-span between 28 and 22 Ma (Rapprich and Holub 2008).

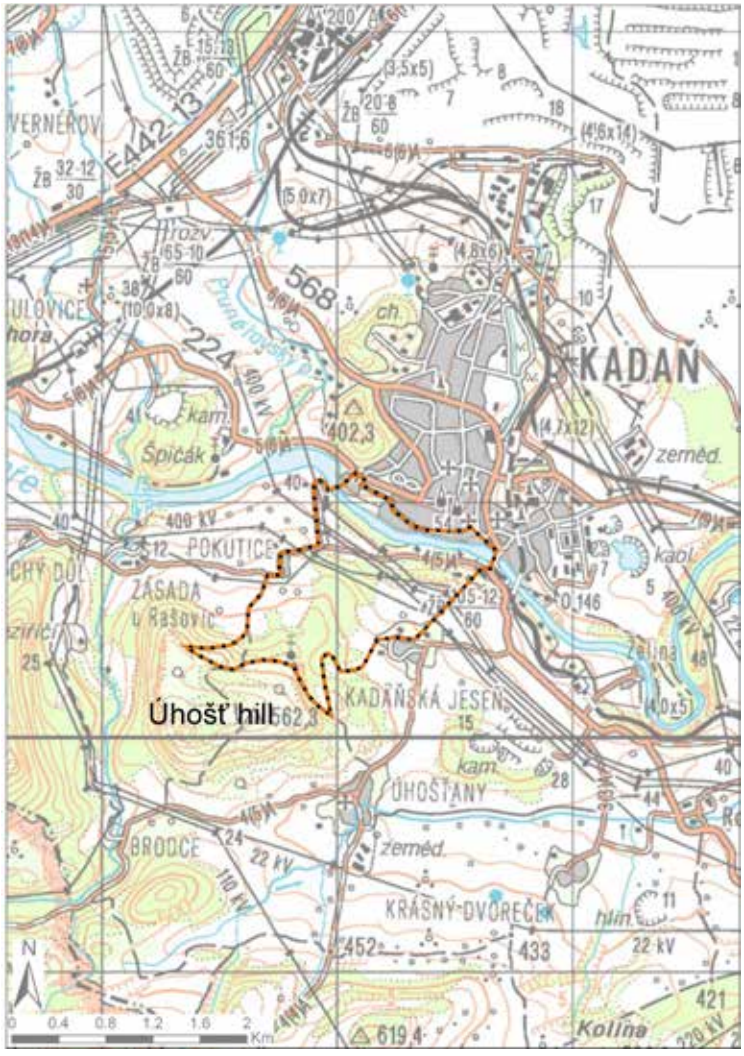

Fig. 1. Track of the mid-conference walk to the Úhošť hill.

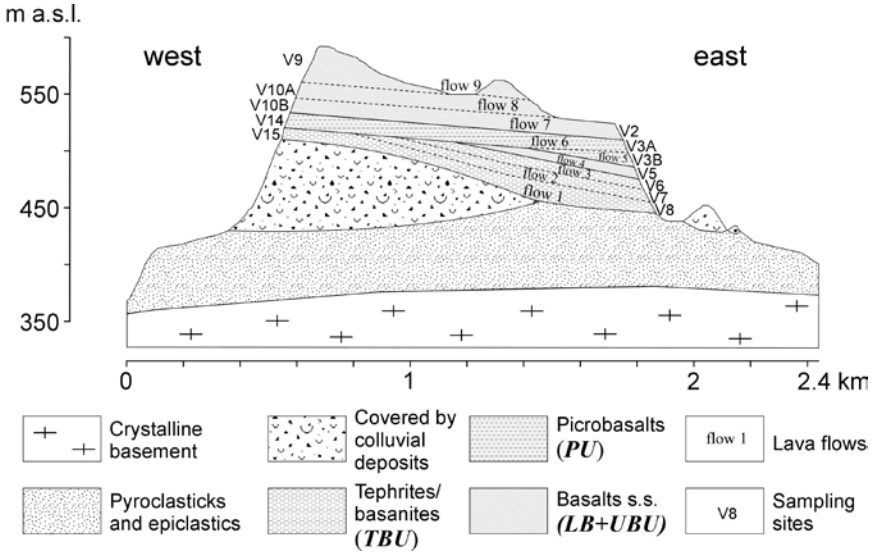

Fig. 2. Interpreted cross-section of the Úhošť table mountain showing the sequence of lava flows.

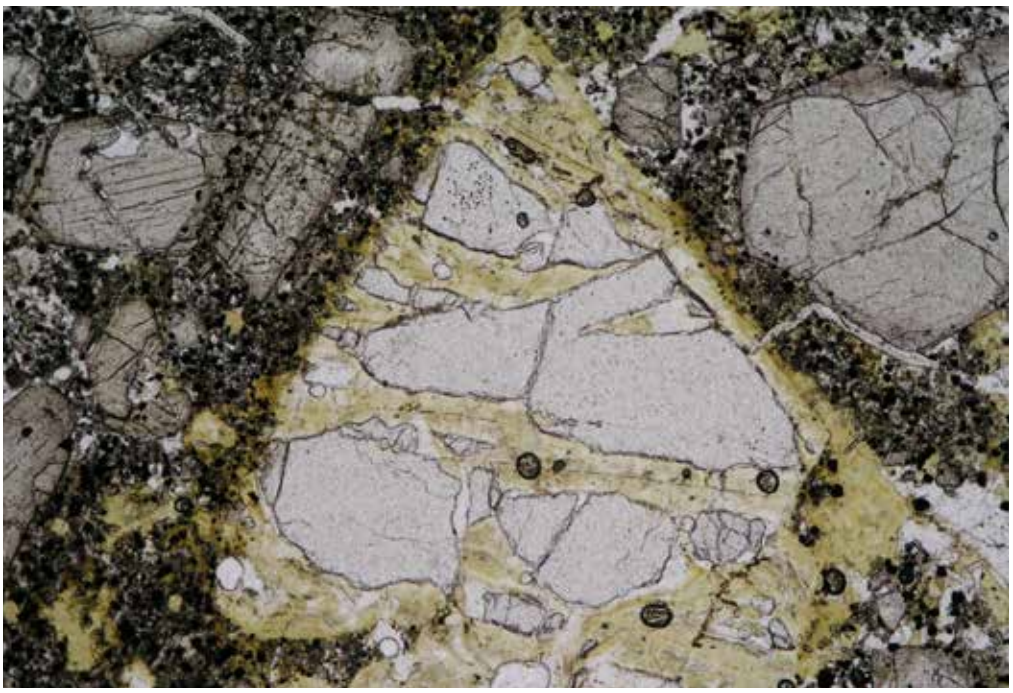

Fig. 3. Microphotograph of picrobasalt from the Úhošť hill (plane-polarized light, real width of the image is 3.2 mm).

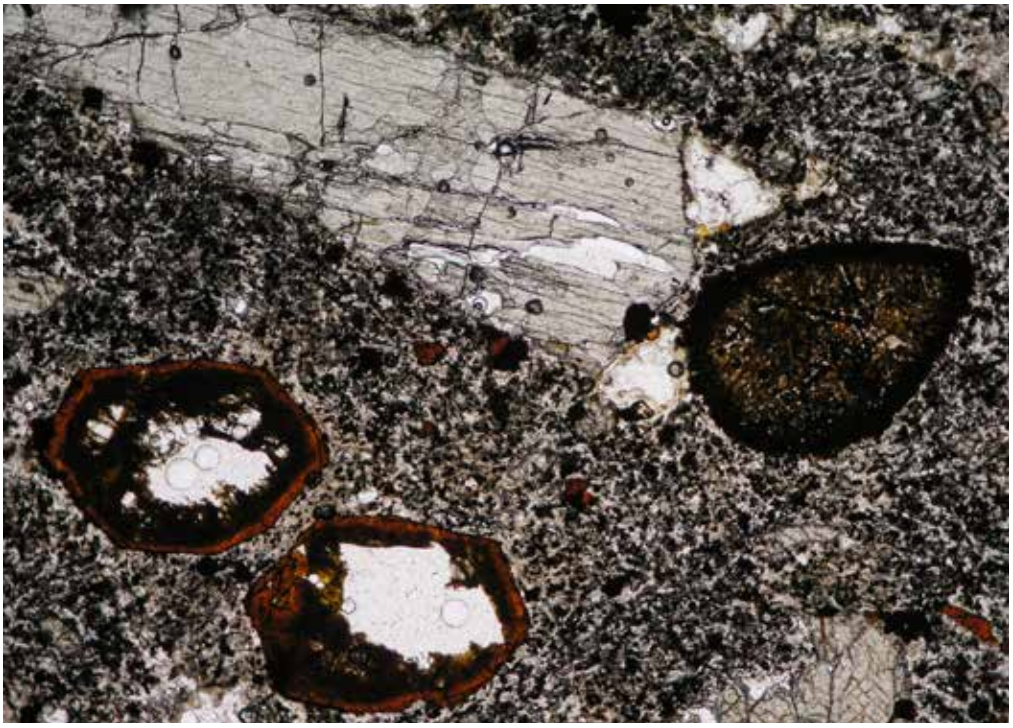

Fig. 4. Microphotograph of alkali basalt with pseudomorph after amphibole from the Úhošť hill (plane-polarized light, real width of the image is 3.2 mm).

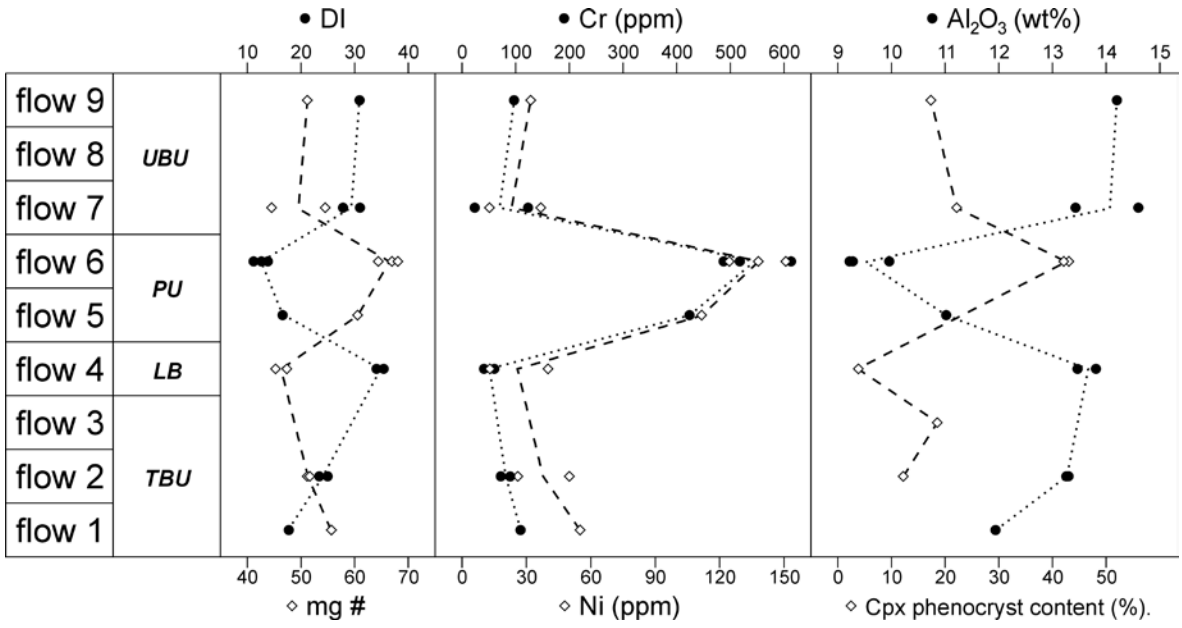

Fig. 5. Compositional variation of lavas in the sequence exposed on the Úhošť hill.

References

Holub F.V., Rapprich V., Erban V., Pécskay Z., Mlčoch B., Míková J. (2010) Petrology and geochemistry of the Tertiary alkaline intrusive rocks at Doupov, Doupovské hory Volcanic Complex (NW Bohemian Massif). *J. Geosci.* **55**, 251–278.

Rapprich V., Holub F.V. (2008) Geochemical variations within the Upper Oligocene-Lower Miocene lava succession of Úhošť Hill (NE margin of Doupovské hory Mts., Czech Republic). *Geol. Quart.* **52**, 253–268