

## **Monazite chemical dating of acidic and intermediate volcanic rocks from the Permian sedimentary cover and dykes of the Infratatric Inovec Nappe in the Western Carpathians**

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The Infratatric (IFTA) Unit (Putiš, 1992) of the Central Western Carpathians is composed of the higher Inovec and the lower Belice Nappes, exposed in Miocene horst of Považský Inovec Mts. The Inovec Nappe is overthrust with the Tatric Unit overloaded with the Mesozoic Fatric and Hronic Nappes. The Inovec Nappe micaschist basement is covered by the Late Carboniferous to mid-Triassic sedimentary rocks (Putiš, 1983). The Permian siliciclastics contain lensoidal km-size bodies of basic and acidic volcanic rocks exposed in wider area of Hôrčanská Valley in middle part of the mountains. Smaller bodies of both types occur in Javorí Hill area in the north, and as olistoliths in the Late Cretaceous flysch sediments of the Belice Succession. The basement and cover rocks show a distinct anchi-metamorphic overprint (Putiš, 1986; Korikovsky and Putiš, 1999; Sulák et al., 2009) which was dated by white mica (illite-phengite; 3.3 Si pfu)  $^{40}\text{Ar}/^{39}\text{Ar}$  plateau age at  $101.2 \pm 2.9$  Ma (Putiš et al., 2009) from a Permian meta-sandstone (sample PI-4, Hôrka Valley, 1km NW of dated meta-rhyolite sample PI-R11). The Tatric Unit hanging wall blastomylonites record a similar older newly-formed white mica age of  $102.3 \pm 1.9$  Ma, and an overprint plateau age of  $48 \pm 2$  Ma (Putiš et al., 2009). The older age is related to mid-Cretaceous underthrusting of the IFTA Inovec Nappe below the north-Tatric nappes. The younger one is most likely related to closure of the Late Cretaceous Belice Basin and formation of the lower IFTA Belice Nappe underthrust below the higher IFTA Inovec and Tatric Nappes. The exhumation ages of the Tatric hanging wall blastomylonites following the mid-Cretaceous metamorphic event occurred from 90 to 70 Ma in Považský Inovec, Malé Karpaty and Malá Fatra Mts., or at ca. 50 Ma at Hrádok–Zlatníky thrust-fault dividing the IFTA and Tatric Units in Považský Inovec Mts. in the Eocene accretionary wedge.

The mid-Cretaceous anchimetamorphosed rocks were the source of the flysch overlying the Couches-Rouges type marls, the clayey matrix of which shows only diagenesis to lowest anchimetamorphic recrystallization, with still well preserved fossil remnants (Putiš et al., 2006, 2008). The inferred frontal Humienec tectonic slice (micaschists and the Permian to Early Cretaceous anchimetamorphosed sedimentary cover) of the Inovec Nappe yielded the most of material for the late Santonian to Maastrichtian flysch, including the Permian volcanic rocks and siliciclastics.

Meta-rhyolite (sample PI-R11, 72–77 wt.% SiO<sub>2</sub>) from area of Hôrka Valley belongs to Permian cover of the IFTA Inovec Nappe. It has well preserved porphyritic texture of quartz, feldspars and biotite in fine grained recrystallized matrix with newly formed celadonite-rich muscovite („phengite“) aggregates. The dated monazite has suitable content of Th (1.4–4.2 wt-%) providing an age of 283±17.4 (2s).

Meta-dacitoandesite (57 wt.% SiO<sub>2</sub>) north of Inovec Hill (sample PI-RD-1) occurs as a dyke crosscutting the Inovec Nappe basement micaschists, which are included as microxenoliths in the dyke. A few occurrences were found on western slopes of Inovec Hill. They have well preserved porphyritic texture of feldspars and biotite, less quartz in fine grained aggregate of lath shape sodic plagioclase, partly to totally replaced by newly formed very fine-grained white mica. In comparison with the meta-rhyolites from Hôrčanská Valley, they are richer in plagioclase that dominate in groundmass. Kalifeldspar occurs only as phenocrysts. The dated monazite has suitable content of Th (1.8–5.6 wt.%) providing an age of 257 ± 6.8 (2s).

The acidic to intermediate composition and different age of volcanic rocks could indicate two timely postponed Permian volcanic phases in the Infratatic pre-Mesozoic basement: 1) The early Permian acidic, and 2) Late Permian intermediate one. Anyway, association of intracontinental within-plate type basalts to basaltoandesites with rhyolites, trachyrhyolites and dacitoandesites (Putiš et al., 2006, 2008) indicate a distinct Permian extension tectonic regime in the IFTA Unit that is not characteristic for the Tatic pre-Mesozoic basement, including the overlying north-Tatic Panská Javorina Nappe.

**Acknowledgement:** The grants APVV-0081-10, APVV-15-0050 and VEGA 1/0079/15 are acknowledged.

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