

The Veporic Orthogneisses - evidence of rejuvenization of a continental crust, the Central Western Carpathians

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The basement of the Central Western Carpathians is derived, as known, from the SE European Variscides, which were partly incorporated into the Alpine orogenic belt – the Cretaceous to Early Tertiary tectonic.

However, the tectonostratigraphy of variscan basement is still recognizable within the Alpine shear zones. According to Bezák, (1994) and Putiš et al. (2003, 2008) basement is divided into:

The Upper unit – Tatra Nappe included para - orthogneisses, layered amphibolite complexes, migmatites, often intruded by Variscan granitoids.

The Middle unit – Hron Nappe consist of micaschists to gneisses or amphibolites.

The Lower unit is composed of the Paetethyan ophiolitic and continental margin related low to medium grade metamorphic complexes.

Granitic orthogneisses in the Upper and Middle Variscan unit or now in the Alpine fabric as part of the Tatric and Veporic basement complexes are mostly represented by granodiorite to tonalite with peraluminous and more or less crustal S to mixed S/I character. Our study and SHRIMP / CHIME data significantly documented, that these rocks can be consider as one of the oldest rocks in the Western Carpathians region.

Granitic orthogneisses s.s. preserve relics of Cadomian basement with magmatic ages from

607 ± 10 to 462 ± 6 Ma, but their inherited cores show concordia ages of more than 617 Ma (up to upper intercept age 2468 – 3399 Ma – the oldest measured age in the West Carpathians, Ondrejka et al. 2008).

The first isotopic rejuvenation occurred around 540 – 530 Ma in Early Palaeozoic phase and (metamorphic / anatectic?) ages refer about strong thermal event and rejuvenation from 381 ± 6 Ma to 326 ± 10 Ma.

On the other side, we try to recognize several events within CHIME dating. And results show, that we are able to observe minimum two stage of evolution, as well – older typically from 352 ± 4 Ma and younger melting at 319 – 322 ± 4 Ma, but we got older the Ordovician to Devonian ages 501 – 477 Ma and 406 – 390 Ma, also. We discovered sign of the Permian and actually the Cretaceous growth or transition of monazites – up to 77 Ma.

And in conclusion – old ages corroborate a two-stage break-up of the Late Proterozoic (Pan-African) northern Gondwana continental margin. The Eo-Variscan metamorphic evolution is coeval with collision and collapse of the Armorica and Laurussia / Avalonia.

And don't forget - Human time is still 0.

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