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# Polymetamorphic evolution of pelitic schists and an evidence for Permian low-pressure metamorphism in the Vepor Unit, West Carpathians

**P. Jeřábek** (1,2), M. Janák (3), S. W. Faryad (1), F. Finger (4), P. Konečný (5)

(1) Institute of Petrology and Structural Geology, Charles University, Prague, Czech Republic (jerabek1@natur.cuni.cz), (2) Czech Geological Survey, Prague, Czech Republic, (3) Geological Institute, Slovak Academy of Sciences, Bratislava, Slovak Republic, (4) University of Salzburg, Division of Mineralogy, Salzburg, Austria, (5) Dionýz Štúr Institute of Geology, Bratislava, Slovak Republic

Phase equilibrium modelling and monazite microprobe dating have been used to characterize the polymetamorphic evolution of metapelites from the northern part of the Vepor Unit, West Carpathians. Three generations of garnet and associated metamorphic assemblages found in these rocks correspond to the three distinct metamorphic events related to the Variscan orogeny, a Permian phase of crustal extension, and the Alpine orogeny. The Variscan staurolite-bearing and the Alpine chloritoid-bearing assemblages record medium-temperature and medium-pressure regional metamorphisms reaching 540–570 ˚C/5–7 kbar and 530–550 ˚C/5–6.5 kbar, respectively. The Permian metamorphic assemblage involves garnet, andalusite, sillimanite, biotite, muscovite, plagioclase, and corundum and locally forms silica-undersaturated andalusite-biotite-spinel coronas around older staurolite. The transition from andalusite to sillimanite indicates a prograde low-pressure and medium-temperature metamorphism characterised by temperature increase from ∼500 to ∼650 ˚C at ∼3 kbar. Since accessory monazites are abundant in the rocks, an attempt was made to derive their formation ages by means of electron-microprobe-based Th-U-Pb chemical dating. Despite the polymetamorphic nature of the metapelites, the monazites yielded uniformly Permian ages. Microstructures confirm that they were formed in relation to the LP–MT paragenesis and the weighted average ages obtained for two different

samples are 275 $\pm$ 12 and 278 $\pm$ 5 Ma. The virtual lack of Variscan and Alpine monazite populations points to interesting aspects concerning the growth systematics of monazite in metamorphic rocks.