considerable scatter between the Middle Jurassic and Middle Eocene which probably reflects complex P-T-t paths. Eocene ages for high-P metamorphism have so far only been reported from two localities in the intermediate tectonic level, i.e. the Sidironero Unit in Greece. We present new results of Lu-Hf garnet geochronology for three eclogites sampled in different localities from a part of the Starcevo Unit in Bulgaria, which belongs to the intermediate tectonic level. These data corroborate a Lutetian age of high-P metamorphism in the intermediate level while a fourth sample from the upper tectonic level (Kardžali Unit) yields a Barremian age. Exhumation of the intermediate tectonic level from a depth corresponding to the Eocene high-P metamorphism was probably accommodated by top-N shearing along the Borovica Fault (coeval with thrusting along the Nestos Fault) and later along the Kyuse-Hasanlartepesi Fault. The Borovica Fault is probably the boundary between the upper and intermediate tectonic levels.

New insights on the occurrence of a Variscan suture in the Upper Danubian Nappe (Romania, Serbia, Bulgaria) evidenced by ^{40}Ar–^{39}Ar geochronology

Plissart G.[1,2,*], Maruntiu M.[3], Neubauer F.[4], Monnier C.[2], Demaiffe D.[1] and Diot H.[2]

[1]*GIGC-IPE, Université Libre de Bruxelles (CP 160/02), 50 av. Roosevelt, B-1050 Brussels, Belgium, gplissar@ulb.ac.be*

[*] *Aspirant du F.R.S.-FNRS*

[2]*UMR-CNRS 6112, LPGN, Université de Nantes, 2 rue de la Houssinière, BP 92208, 44322 Nantes Cedex 3, France*

[3]*IGR, 1 Caransebes str., RO-78344, Bucuresti, Romania*

[4]*Dep. of Geog. and Geol., Hellbrunnerstraße 34, A-5020 Salzburg, Austria*

The Alpine Upper Danubian Nappe crops out in the Southern Carpathians in Romania and in the North of the Balkans in Serbia and Bulgaria. The pre-alpine basement of this Nappe displays an important tectonic marker in the form of the Danubian Ophiolite. This Ophiolite (~ 500 km^2) has been dismembered by the Oligocene Alpine tectonic in four ophiolitic massifs: Tisovita Iuti in Romania, Deli Jovan and Zaglavak in Serbia and Tcherni Vrah in Bulgaria. Although the Danubian Ophiolite has been considered as Late Proterozoic during the last decades, the Deli Jovan massif has been recently dated to the Lower Devonian (U-Pb zircon age of 405 ± 2.6 Ma). Our study gives a petrostructural analysis investigated on listvenitic gabbros from the Tisovita Iuti ophiolitic massif and their adjacent rocks (Corbu Unit) and provides new geochronological data on the listvenitization processes.

Listvenitic gabbros consist of a metasomatic assemblage composed of zoisite + calcite + Cr-chlorite + Cr-muscovite developped on amphibolitized gabbros under strongly hydrated conditions at temperatures around 280°C. They are located in a thin N-S band at the Eastern part of the Tisovita Iuti ophiolitic massif and generally display a mylonitic texture. Similarly, the Corbu Unit crops out in a 2 km wide N-S band, at the eastern part of the listvenitic gabbros, and consists of a mélange of slices composed of various metamorphic rocks (volcano-sedimentary rocks, margin sediments, acid volcanic rocks and ophiolitic rocks) from low- to high-grade.

Structural data obtained on listvenitic gabbros and on Corbu rocks indicate that these two units have undergone a similar deformation, which is partitioned between highly deformed mylonites and slightly-deformed juxtaposed rocks. These rocks display high-dip North-Southward foliation planes, associated with a strong subhorizontal stretching mineral lineation and isoclinal folds parallel to this lineation. These fabric elements appear to develop during the same event, giving evidence for components of both simple and pure shear, suggesting a deformation which probably occurred in a transpressive context.

New ^{40}Ar-^{39}Ar ages performed on two Cr-muscovites from slightly and highly listvenitized gabbros give plateau ages of 372.6 ± 1.3 Ma and 360.6 ± 1.2 Ma, respectively. As the listvenitization process involves important chemical remobilisations with the presence of CO_2-rich fluids and according to the similar deformation type encountered both in the Corbu mélange and in the listvenitic gabbros, we propose that these rocks are formed close to

an accretionary wedge and probably correspond to the obduction sole of the Danubian ophiolite during a Variscan oblique collision.

These results imply the occurrence of a Variscan oceanic suture in the Eastern part of the Variscan Belt, classically ending in the Sudetes Area (Poland). Moreover, the Late Devonian closure of the Danubian oceanic domain is very similar to data observed for the evolution of the Rheic Ocean and its associated basins.

Petrology and geodynamics: findings from Dinarides – Hellenides and adjoining regions

Poli G.[1], Christofides G.[2], Cvetković V.[3], Perugini D.[1] and Koroneos A.[2]

[1]*Department of Earth Sciences, University of Perugia, Piazza Università, I-06100 Perugia, Italy, polig@unipg.it*
[2]*Department of Mineralogy, Petrology, Economic Geology, Aristotle University of Thessaloniki, GR-54124 Thessaloniki, Greece, christof@geo.auth.gr, koroneos@geo.auth.gr*
[3]*Faculty of Mining and Geology, University of Belgrade, Dušina 7, 11000 Belgrade, Serbia, cvladica@rgf.bg.ac.rs*

Subduction-related mantle derived melts in the Dinarides and Hellenides commonly display large compositional variations. Focusing on Tertiary granitoid and volcanic mafic products and using major and incompatible trace elements as proxy to get insights on metasomatic events, diagrams show that mafic melts ranging from calc-alkaline to shoshonitic and ultrapotassic are ubiquitous, indicating the coeval occurrence of mantle-derived melts with strongly different enrichments of incompatible elements. These findings suggest that a heterogeneous mantle, able to generate such a rich compositional variability of melts, existed during Tertiary in the area.

Actually, two mantle source compositions are considered just as two extreme end-members occurring in a mantle wedge able to generate melts spanning all intermediate potassium compositions. The first end-member can be interpreted as being derived by partial melting processes of a strongly metasomatized mantle source where K-rich phases, such as phlogopite, played a key role. The low contents of Al, Na, and Ca, and the high concentrations of compatible elements argue in favour of a restitic peridotitic source. The second mantle end-member shows higher Al, Na, and Ca contents, and lower contents of compatible elements, suggesting a derivation from a fertile metasomatized lherzolitic mantle source.

The main question arises as to what processes may generate such an inhomogeneous mantle wedge. Numerical simulations of infiltration of metasomatic fluids into a lithospheric mantle wedge have been performed. We consider a fractured lithospheric mantle wedge in which metasomatic fluids, released by dehydration of the oceanic slab, infiltrate. For simplicity sake we consider that fluids are constituted by only one "metasomatic agent" (e.g. K_2O). The fracturing of the mantle is assumed to be random. We also assume that fractures are always saturated with the metasomatic fluids and that metasomatism is developed by diffusion of such fluids from fractures to the surrounding mantle. Results show that the efficiency of the process is directly proportional to the density of fractures: the higher the density of fractures, the higher the metasomatism in the mantle wedge. This process resulted in coexisting portions of mantle that suffer metasomatism at very variable degrees, leading to a "leopard-skin"-like mantle. Partial melting of such a heterogeneous mantle wedge would produce mafic melts with highly variable degree of enrichment of incompatible elements. On the basis of these considerations we suggest the presence, during the Tertiary, of a metasomatized "leopard-skin" mantle wedge with highly variable chemical compositions, the partial melting of which may explain the wide compositional spectrum of mafic magmas in Dinarides and Hellenides.

Mantle metasomatism and magmatism can be attributed to the complex geodynamic evolution of the area. In particular, we suggest that two subduction events metasomatized the same mantle wedge from Early Jurassic to Tertiary, the partial melting of which led to strongly different mafic magmas.