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

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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.