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VÁRGESZTES

(Western Hungary, Vértes and Gerecse Hills, Mór wine region)

24-27th April 2013

ABSTRACT BOOK

Editors:

LÁSZLÓ FODOR, SZILVIA KÖVÉR



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progressively destroy the sharp boundary between the two colliding plates which is replaced by several hundreds to thousand kilometres wide transitional zone – the diffuse supra-subduction orogen.

References:

- Janoušek, V. et al. Deciphering the petrogenesis of deeply buried granites: whole-rock geochemical constraints on the origin of largely undepleted felsic granulites from the Moldanubian Zone of the Bohemian Massif. *Trans. Roy. Soc. Edinb., Earth Sci.* 95, 141-159 (2004).
- Lexa, O. et al. Heat sources and trigger mechanisms of exhumation of HP granulites in Variscan orogenic root. *J. Metamorph. Geol.* 29, 79-102 (2011).
- Schulmann, K. et al. Vertical extrusion and horizontal channel flow of orogenic lower crust: key exhumation mechanisms in large hot orogens? *J. Metamorph. Geol.* 26, 273-297 (2008).
- Schulmann, K. et al. An Andean type Palaeozoic convergence in the Bohemian Massif. *C. R. Geosci.* 341, 266-286 (2009).

Crystal preferred orientation as a result of deformation effects in the upper mantle beneath the Nógrád-Gömör Volcanic Field - a study on peridotite xenoliths

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Crystal preferred orientations, the distribution of crystallographic axes according to a determined plane, in the major rock forming silicates of the upper mantle are developed as a result of changes in the physical conditions (pressure, temperature, stress, strain, etc.). These rock forming minerals (mainly olivine and pyroxenes) can be studied in peridotite xenoliths that are included in volcanic rocks such as alkali basalts, kimberlites or lamprophyres, and represent the characteristics of the upper mantle beneath the given region.

In the Carpathian-Pannonian region there are five known occurrences where young, Plio-Pleistocene alkali basalts brought upper mantle ultramafic xenoliths to the surface (Styrian Basin, Little Hungarian Plain, Bakony-Balaton-Highland, Nógrád-Gömör and Persany Mountains) (Szabó et al., 2004). The Nógrád-Gömör Volcanic Field (NGVF) is located in the northern part of the region where various petrologic and geochemical studies have been conducted in the past few decades (Szabó and Taylor, 1994; Konečný et al., 1995). However, there is a lack of examinations focusing on crystal preferred orientation.

We selected 13 representative lherzolite xenoliths from 7 quarries of the NGVF and carried out detailed examinations concerning modal composition, texture types and major element geochemistry. Furthermore, EBSD (electron backscatter diffraction) measurements were also carried out in order to determine olivine and orthopyroxene crystal preferred orientations. The distribution of crystallographic axes in olivines are plotted in a series of pole figures (Fig. 1.) and can be divided into three distinctive groups based on the align

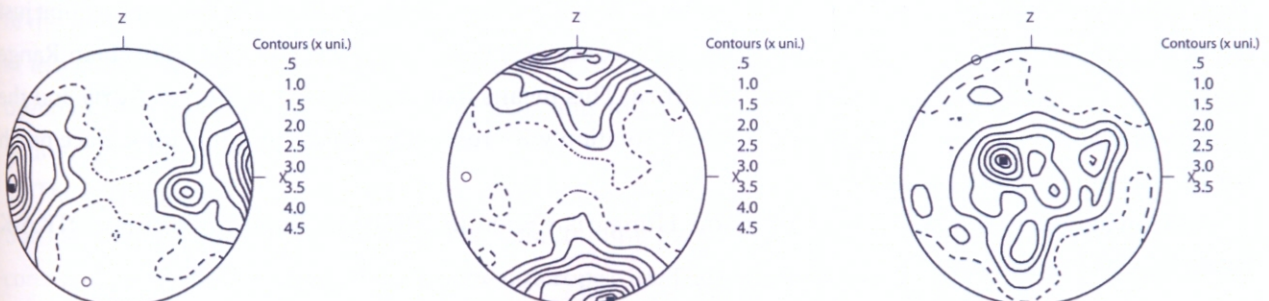


Figure 1. Pole figures of the a, b and c axes of olivine in the NFK1123 xenolith.

ment and directions of the a, b and c axes according to the foliation plane. These distribution groups are more or less related to the macroscopic texture and show a correlation with olivine J-indexes, which indicate the strength of the xenolith fabric. Our results show that there is also a link between crystallographic orientations and calculated equilibrium temperatures. Samples from the southern part of the Nógrád-Gömör Volcanic Field (Bárna-Nagykö) display an overall lower equilibration temperature range than those collected in the central part (Babi Hill and Medves Plateau). This difference in temperature, and hence in the estimated depth of origin, may be responsible for the observed distribution of olivine crystal axes. Nevertheless, various crystallographic orientations suggest that there may be more deformation mechanisms that have activated on distinct levels of the mantle beneath the NGVF.

References

- Konečný, P., Konečný, V., Lexa, J., Huraiová, M., 1995. Mantle xenoliths in alkali basalts of Southern Slovakia. *Acta Vulcanologica*, 7, 241-247.
- Szabó, Cs., Falus, Gy., Zajacz, Z., Kovács, I., Bali, E., 2004. Composition and evolution of lithosphere beneath the Carpathian-Pannonian Region: a review. *Tectonophysics*, 393, 119-137.
- Szabó, Cs., Taylor, L., 1994. Mantle petrology and geochemistry beneath the Nógrád-Gömör Volcanic Field, Carpathian-Pannonian Region. *International Geology Review*, 6, 328-358.

Clockwise rotation of the Transdanubian Range and Adria close to the K/T boundary implicated by counter-clockwise rotated paleomagnetic directions

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Sometime ago, westerly Mesozoic paleomagnetic declinations in the European sector of the Alpine-Mediterranean zone were considered as manifestations of "African affinity". Soon it was realized, however, that the solid paleomagnetic proof for the Southern Tethyan origin is the "African" character of the Mesozoic APW, which is supposed to have been preserved in all Africa derived tectonic units. This has been documented for both Adria and the Transdanubian Range. At the same time, significant CCW rotations affected both areas after the Cretaceous. It was of post-Eocene age for stable Adria (about thirty degrees in total), but the exact time is not constrained by direct data from this unit. The presently available data from the Transdanubian Range point to three phases of Cenozoic CCW rotation, with an accumulated angle of eighty degrees measurable on the oldest Cenozoic rocks. When the connection between the Mesozoic declination patterns and the Cenozoic paleodeclinations is inspected, we find a sedimentary hiatus in both areas interrupting the paleomagnetic record. It is very short in Adria (a few Ma close to the K/T boundary) and probably much longer in the Transdanubian Range. At the older side of the hiatus, the paleomagnetic declinations are less westerly than on the younger side. This situation in itself points to a "hidden" CW rotation of both, the Transdanubian Range and Adria, during the time of the sedimentary hiatus. African declinations exhibit just the opposite trend. It follows that close to the K/T boundary, both Adria and the Transdanubian Range changed their orientation also with respect to Africa. This means that the first decoupling of Adria and the Transdanubian Range was accompanied by a CW rotation with respect to Africa, and this took place much before the obvious CCW rotations.

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