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A segment of oceanic crust, in Macedonian (FYROM) ophiolites, seen through sheeted dyke diabases, keratophyres and adakite-like volcanics

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Macedonian Eastern Vardar Ophiolitic unit represents a part of the Neotethys that was obducted onto the European Margin (Serbian Macedonian Massif). It comprises of well exposed sheeted dykes complex, with pillow lavas as a top unit, which is intruded by intermediate to acid dykes and sills of different geochemistry. We present new geochemical data for both of the units as well as an Ar-Ar age for acid rocks.

Investigated samples can be clearly distinguished into the two groups based on geochemical features:

i) Samples collected from the sheeted dykes and pillows, show SiO_2ranging from 47-56%, relatively high $TiO_2$1.5-2.8%, and Al_2O_3 ranging from 12-15 %. In terms of trace element geochemistry, they show flat trace element patterns ($(La/Yb)_n$ = 0.5-2.4, $(La/Sm)_n$ =0.5-1.3 and $(Sm/Yb)_n$ = 0.8-1.2) consistent with MORB compositions;

ii) Intermediate to felsic intrusions (keratophyres and adakite-like volcanic) show large range of $SiO_2$and Al_2O_3 contents (45-73% and 16-13.5%, respectively), and are markedly depleted in TiO_2, Nb and Ta, as well as enriched in LILE, like U, Th; they also show enriched REE patterns ((La/Yb)n = 3.56-14.79, $(La/Sm)_n$ =2.30-3.70 and $(Sm/Yb)_n$ =1.20-4.04) characteristic for arc volcanic rocks generated in a subduction zone environment. The most mafic members of this group demonstrate many features typical for adakites, like high Al_2O_3, extreme depletion in HREE with large extent of REE fractionation, high Sr concentrations and high Sr/Y, Sr/Yb, Dy/Yb ratios. Their adakitic features are also seen in trace element compositions of clinopyroxene (cpx) phenocrysts, having high Sr and Dy/Yb for high Mg#, comparable to cpx from Aleutians which is adakitic type locality .....(Yogodzinski and Kelemen, 1998). On the other hand, the most evolved rocks from this group geochemically resemble upper Jurassic granitic rocks from the area: Fanos (Greece), Furka and Stip granites (FYRO-Macedonia) ..(...)..(Saric et al., 2009). Our Ar-Ar potassium feldspar dating gave 164 $\pm$ 0.15 Ma which is in agreement with K-Ar ages available for Macedonian granitic rocks (around 160 Ma).

In our view, the rocks which occur within volcanic sequence of Macedonian (FYROM) ophiolites, represent two genetically different magmatic suites. The first one represents a volcanic member of oceanic crust of MORB composition, probably erupted in a fast-spreading environment. The second suite is younger and we interpret it as being produced by simple mixing or AFC, of the adakite-like primary melts and a felsic end-member similar to the melts which crystallized Jurassic granitic rocks from the area. The extent of granite involvement goes up to 45% for the most felsic samples from our intermediate suite. In our contribution, we will combine our geochemical data with available geological data, in order to review possible geodynamic scenarios which enable formation of Macedonian ophiolites.

.Saric, K., Cvetkovic, V., Romer, R.L., Christofides, G. and Koroneos, A., 2009. Granitoids associated with East Vardar ophiolites (Serbia, F.Y.R. of Macedonia and northern Greece): Origin, evolution and geodynamic significance inferred from major and trace element data and Sr-Nd-Pb isotopes. Lithos, 108(1-4): 131-150.

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