Sources and magma evolution of Eastern Srednogorie, SE Europe: conventional and *in situ* isotope data

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Eastern Srednogorie zone is the easternmost part of the Apuseni-Banat-Timok-Srednogorie (ABTS) magmatic and metallogenic belt, situated in SE Europe. It formed during the Late Cretaceous as a result of the continuous subduction of the Tethyan ocean beneath the southern continental margin of Europe and hosts world-class Cu-Au deposits. Extensive studies during the GEODE project of ESF in the Central part of the belt suggest that slab roll-back during oblique subduction was the main process in the evolution of the belt [1]. The geodynamic reconstruction of this zone is essential for understanding the Alpine evolution of Balkan peninsula.

Magmatism in Eastern Srednogorie zone is the most voluminous, basic and K-rich, compared to other parts of the ABTS belt. Mafic igneous rocks prevail here with mostly intrusive varieties to the south and mostly volcanic rocks in the northern part. Presented new major and trace elements whole-rock (WR) data for the magmatic rocks across the belt trace a compositional change from tholeitic, Ca-alkaline, high-K Ca-alkaline, shoshonitic to high-K transitional rocks from S to N. The abundances and normalized patterns of the WR trace elements are typical for subduction generated magmas.

We conducted extensive *in situ* U-Pb LA-ICPMS and high-precision single-grain ID-TIMS dating on zircons from the major plutons in the southern, intrusive-dominated part of the zone. Standard air-abrasion, as well as chemical abrasion was used as zircon preparation procedure for the conventional dating. The results for a number of intrusions and dykes show time span of the magmatism from 86.3 till 77.9 Ma with most of the rocks crystallizing in the Campanian. Inherited grains ages cluster in the Ordovician (O) and Permian (P), fewer in the Carboniferous (C). Granitic rocks from the basement are dated as Permian. The initial εHf values of the Cretaceous zircons are positive (+6.5 and +7.3 to +14), whereas inherited old zircons have a contrasting initial εHf of –0.40 to –7.02. This, combined with the initial $^{87}Sr/^{86}Sr$ whole-rock ratios (0.7040-0.7048 for the basic rocks and 0.7056-0.7059 for the granite intrusions) supports a mantle derived origin of the Cretaceous magmas. The latter mixed with crustal rocks of O, P and C age to produce the intermediate and acid rock varieties.

References

[1] vonQuadt et al. (2005) *ORG* **27,** 95-126.