Understanding a volcanic history of SW part of Lece Volcanic Complex from plagioclase composition, zircon geochemistry and U-Pb age

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Abstracts

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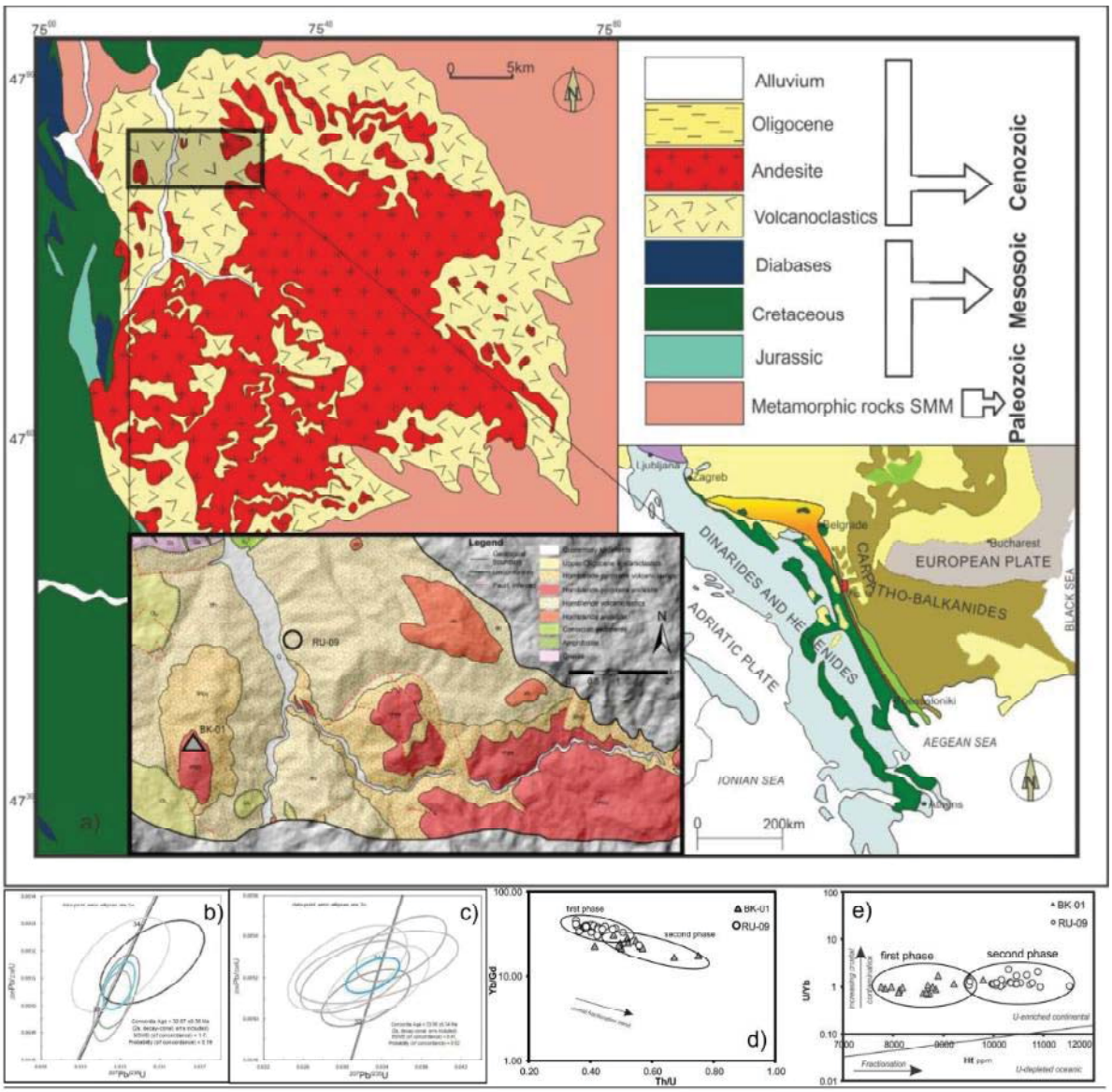
This study reports a petrography, new radiometric age, zircon trace element and microprobe analyses on plagioclase of the northwest part of Lece Volcanic Complex (LVC) in Southern Serbia. LVC is developed on the suture between the Vardar zone and Serbo-Macedonian Massif, and it is one of the major Oligocene volcanic regions in the Central Balkan Peninsula (figure 1a). Volcanism is clearly post-collisional, and the major driving force has been most probably the delamination of the metasomatized subcontinental mantle. Volcanic rocks occur as relics of large calderas, lava flows as subvolcanic intrusions and in different volcaniclastic facies of andesite. Radiometric data from U-Pb method revile two igneous events. The first event comes to 33.5 Ma (sample RU-09), while the second igneous event occurred at 32.6 Ma (sample BK-01) (figure 1b, c). Hornblende andesite is characterized as the first volcanic phase, while the second phase is dominantly presented with hornblende-pyroxene andesite. Zircon trace elements distribution pattern normalized to chondrite shows a smooth pattern typical for magmatic zircons. Pattern shows positive Ce and negative Eu anomalies. Yb/Gd vs. Th/U diagram show a normal trend of magma chamber fractionation (figure 1d). Elevated U/Yb with respect to increasing Hf concentrations that are indicative of derivation from a transitional type of environment with normal arc magmas contaminated with continental material (figure 1e). Different mineralogical composition in these two volcanic phases reviles that the younger phase has reverse plagioclase zoning with $An_{48.5}$ in the centre, and $An_{62.6}$ on the rim. All this evidence points probably to processes which suggest of reheating resident magma by overheated hot plumes which recharge reservoir or mixing two magmas with dramatically different compositions with a new portion of basaltic magma input.



Analyses of plagioclase phenocrysts BK-01 and RU-09 samples

Sample	Chemical composition						
	SiO_2	Al_2O_3	FeO	CaO	Na_2O	K_2O	Total
BK-01 core	55.58	28.19	0.23	9.51	5.26	0.47	99.24
BK-01 rim	51.25	31.20	0.48	12.68	4.04	0.23	99.88
RU-09 core	56.62	27.82	0.26	8.22	6.58	0.37	99.87
RU-09 rim	56.53	27.70	0.22	8.68	6.09	0.24	99.46