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# Oceanic crust production in the Dinarides during the Senonian: combined U-Pb in situ laser ablation ICP(MC)-MS zircon and mineral separates Ar-Ar dating

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Serbian ophiolitic belts are part of ophiolite occurrences traced from the Alps to the Himalayas. Even though they represent one of the largest ophiolitic areas in the world, they are only poorly studied. Our ongoing project presents a comprehensive study of remnants of magmatic members of oceanic crust from Bosnia, Serbia and Macedonia. Here, we present new geochemical data for the area with focus on new U-Pb and Ar-Ar ages for mafic rocks from the Dinarides. It is thought that closure of oceanic domains present in the area of the Dinarides finished latest in early Cretaceous time, based on K-Ar ages of amphibolites from metamorphic sole and over-step sequence conglomerates.

The severely altered rocks (LOI up to 9 %, high mobile element content) are characterized by low Ni and Cr contents and Mg# number (66-44), implying that fractionation of mafic minerals was one of the processes modifying these magmas. Based on trace element geochemistry, especially REE patterns, rocks dis-

play MORB (depleted LREE compared to HREE,) and marginal basin basalt (somewhat elevated LREE over HREE,) signatures. The isotopic data, measured on leached samples, show more radiogenic $^{87}Sr/^{86}Sr$ (0.703854-0.704317), unradiogenic $^{143}Nd/^{144}Nd$ (0.512860-0.512733), and radiogenic $^{206}Pb/^{204}Pb$ (18.478-20.284), $^{208}Pb/^{204}Pb$ (38.485-39.957), and $^{207}Pb/^{204}Pb$ (15.611-15.709) values when compared with recent MORB. Although the Sr and Pb composition could reflect see water contamination, the Nd isotopic composition suggests a subduction-related setting for the generation of these magmas.

We used a novel approach in ophiolite research by combining U-Pb and Lu-Hf zircon analyses by in situ laser ablation ICP-(MC)-MS and Ar-Ar dating. Combined Hf (in zircon) and Nd (on whole rock samples) data give the most accurate information about the composition of the source. First data show that zircon from a gabbro have $^{176}Hf/^{177}Hf$ slightly higher than chondritic values (0.282730 $\pm$ 0.000028; 2SD; $\varepsilon$Hf of 0.8 $\pm$ 1.0) which is compatible with a subduction-related setting.Our combined Ar-Ar and U-Pb dating show that – at least locally in the Dinarides – oceanic crust formed in the Senonian. The U-Pb zircon ages show that gabbros crystallized at 103.2 $\pm$ 1.5 Ma and confirm the amphibole Ar-Ar ages (109 $\pm$ 17 Ma). Pillow lavas from another Dinaric locality gave even younger plagioclase Ar-Ar ages (61 $\pm$ 14 Ma). Commonly it was thought that oceanic domains in the Dinarides had closed no later than the early Cretaceous. Our data, however clearly, suggest that oceanic crust was produced for a long time and lasted at least till Campanian/Maastrichtian times. It is currently too early to make new geotectonic interpretation but these results give completely new insights in our understanding of geodynamic development of this part of Balkans.