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Neogene volcanism of Jezevo Brdo (Macedonia): an unusual type of Mediterranean lamproites

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A belt of lamproitic volcanism occurs within the Vardar Suture Zone of Balkan Peninsula, transecting Serbia and Macedonia. Together with lamproitic occurrences in Spain and Italy, it represents typical Mediterranean type lamproitic volcanism. In Macedonia, this volcanism forms small and thin lava flows. One of the largest ultrapotassic occurrences is the locality of Jezevo Brdo, for which an Ar-Ar age of 5.98 (0.03) Ma is obtained. At Jezevo Brdo volcano, two phases of volcanism is interpreted as explosive and effusive. The explosive events produced coarse- to medium-grained pyroclastic fall deposits, which are interlayered with redeposited volcano-sedimentary material. This phase was followed by formation of autoclastic breccia and coherent ultrapotassic lava flows, which are platy jointed or massive in the upper most part of the profile. Their thickness is up to 20 m. Jezevo Brdo volcanics are holo- to hypocrystalline porphyritic and mostly have massive, rarely vesicular structure. Mg-rich phlogopite overgrown by tetraferriphlogopite, low-Al clinopyroxene, olivine, and leucite appear as (micro)phenocrysts, whereas the groundmass consists of the same minerals along with apatite, potassium feldspar, and magnetite. In keeping with their affinity to Mediterranean (orogenic) lamproites, Jezevo Brdo rocks have relatively elevated Al2O3 contents and low K2O/Al2O3, SiO2 as well as high TiO2 contents. These rocks are enriched in LILE relative to HFSE. However, unlike other Mediterranean lamproitic rocks, they are moderately enriched in Nb and considerably in TiO2 (up to 2.1 wt percent). The high Mg# (around 70) does not correlate with main oxides, suggesting that fractionation of mafic minerals was not the only process modifying these rocks. It is widely accepted that ultrapotassic rocks are formed by partial melting of metasoma-

tised lithospheric mantle. One of the popular interpretations of their radiogenic Sr isotope signature, coupled with unradiogenic Nd isotope ratios, is the crustal involment in the mantle source via subduction of continental material. Jezevo Brdo lamproitic rocks exhibit high TiO2 contents, moderate Nb, and superchondritic Zr/Hf (34.07-40.67) and Nb/Ta (17.99-25.93). This infers that their source must have been metasomatised not just with crustal material but also with material that had high Nb, TiO2, Zr/Hf and Nb/Ta. Our preliminary Sr-, Nd- and Pb isotopic data, show somewhat less radiogenic 87Sr/86Sr (0.7087-0.7082) and 207Pb/204Pb (15.691-15.702), and more radiogenic 143Nd/144Nd (0.512358-0.512352), 206Pb/204Pb (18.79-18.82), and 208Pb/204Pb (38.85-38.91) compositions relative to other Mediterranean lamproitic rocks. All these geochemical features point to a role of an asthenosphere-derived metasomatic component, most likely of carbonatitic composition.