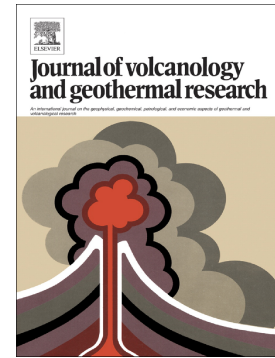


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The onset of the volcanism in the Ciomadul Volcanic Dome Complex (Eastern Carpathians): eruption chronology and magma type variation

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Abstract

Combined zircon U-Th-Pb and (U-Th)/He dating was applied to refine the eruption chronology of the last 2 Myr for the andesitic and dacitic Pilișca volcano and Ciomadul Volcanic Dome Complex (CVDC), the youngest volcanic area of the Carpathian-Pannonian region, located in the southernmost Harghita, eastern-central Europe. The proposed eruption ages, which are supported also by the youngest zircon crystallization ages, are much younger than the previously determined K/Ar ages. By dating every known eruption center in the CVDC, repose times between eruptive events were also accurately determined. Eruption of the andesite at Murgul Mare (1865 ± 87 ka) and dacite of the Pilișca volcanic complex (1640 ± 37 ka) terminated an earlier pulse of volcanic activity within the southernmost Harghita region, west of the Olt valley. This was followed by the onset of the volcanism in the CVDC, which occurred after several 100's kyr of eruptive quiescence. At ca. 1 Ma a significant change in the composition of erupted magma occurred from medium-K calc-alkaline compositions to high-K dacitic (Baba-Laposa dome at 942 ± 65 ka) and shoshonitic magmas (Malnaș and Bixad domes; 964 ± 46 ka and 907 ± 66 ka, respectively). Noteworthy, eruptions of magmas with distinct chemical compositions occurred within a restricted area, a few km's from one another. These oldest lava domes of the CVDC form a NNE-SSW striking tectonic lineament along the Olt valley. Following a brief (ca. 100 kyr) hiatus, extrusion of high-K andesitic magma continued at Dealul Mare (842 ± 53 ka). After another ca. 200 kyr period of quiescence two

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