The eruptive history of the small and isolated andesitic Caraci Volcano, developed adjacent to Zărand Basin, South Apuseni Mountains, Romania.

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Caraci Volcano has a slightly asymmetrical buttressed edifice with an ellipsoidal dome structure (D/H ratio 10.7) on top and a total height of 420m, covering a surface estimated at 22km^2. It is located in a small Miocene tectonic basin that has developed adjacent to Zărand Basin, in the South Apuseni Mountains of the Carpathian-Pannonian Region. It was active at around 12.5Ma. Most of the volcanic structure overlies the pre-Neogene basement made of ophiolitic basalts and intruded by younger igneous bodies, while the northern part of the edifice covers Miocene sedimentary deposits (coarse quartz gravel, shales and weakly consolidated sandstone). 3D modeling of the surface of the basement reveals a wedge like basin delimited by normal faults and cut by transversal adjustment normal faults that facilitated volcanic activity. The first volcanic deposits consist of highly fragmented tuffs (sometimes up to 40m thick), covered on the northern slope by a hornblende-plagioclase-phyric andesitic lava flow, and on the southern slope by a highly fragmented breccia of phreatomagmatic origin. The volcanic activity continues with a hornblende-plagioclase-phyric andesitic lava flow sequence that comprises most of the volume generated by Caraci and which spreads over most of the surface covered by the volcanics; flow units juxtapose to a maximum thickness of 100m and slight, but consistent geochemical and petrological variations are observed from bottom to top. Two more, less voluminous andesitic effusions add up to the volcano, one with entirely opacitised hornblende and the latter with almost completely disintegrated opacite and microcrysts of clino- and ortho-pyroxenes. The final effusion consists in the growth of the central dome structure, made of two-pyroxene-plagioclase-phyric basaltic andesites. The southern slope and in less extend the northern, are covered by breccias of pyroclastic origin, made of centimeter-to-meter sized basaltic andesite fragments bounded together in cineritic material; they are interpreted as block-and-ash deposits resulted from dome collapsing events. Meter sized angular basaltic andesite blocks are spread over the eastern, southern and western slopes of the volcano.

From a petrological view, feldspars from each sample show disequilibrium textures and overgrowths that create a variety of patterns, consistent with temperature rise, depressurization or undercooling. These patterns become more complex with each new eruption, until the effusion of the dome-building basaltic andesites that show again simpler patterns. Hornblende also develops thicker reaction rims and more profound opacitisation and resorbtion until it is completely replaced by pyroxenes. This is interpreted as evidence for magma mixing and it is consistent with geochemical modeling that suggests mixing with a more primitive batch of magma. Magnetic susceptibility variations are supporting the petrological assumptions.