



Structural control on volcanism in intraplate post collisional settings: late Cenozoic to Quaternary examples of Iran and Eastern Turkey

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Volcanic activity focuses along plate boundaries. However, large volcanoes are also found in intraplate settings. For these volcanoes, geodynamic processes responsible for magma generation and structural controls on magma rise and extrusion need to be evaluated. We merge original (field and remote sensing) and available (geodetic, geophysical, and petrological) data to consider the tectono-magmatic relationships of three large intraplate volcanoes in the E-Anatolian-Iranian plateau; Sar'akhor (NE Iran), Damavand (Central Alborz) and Ararat (E Anatolia). In NE Iran, a Miocene-Pliocene NW-trending compression activated E-W dextral faults to the NW of Sar'akhor, and N-S sinistral faults to the SE, creating an extruding wedge to the west of this volcano. Since Quaternary, NE-trending compression inverted fault movement, hindering further block extrusion and volcanism terminated. The adakitic composition of the Sar'akhor rocks suggests post-collisional melting of oceanic slab and/or mafic lower crust, possibly triggered by an asthenospheric rise after slab break-off or intra-mantle delamination. For the active Damavand and Ararat volcanoes, available data suggested magma generation due to rising hot asthenosphere, following lithospheric delamination or slab break-off in a transtensional environment. The features common to Sar'akhor, Damavand and Ararat allow proposing a model, where transtension focuses the rise of magma in intraplate settings overlying hot asthenosphere produced by delamination or slab break-off.