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The new findings about characteristics of the Eocene volcano-sedimentary basin of Alborz Ranges, Iran

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Alborz Ranges in North Iran had been a volcano-tectonic depression in Eocene times. The various clastic sedimentary and volcaniclastic and also different volcanic rocks with affinities of a continental collision arc were deposited.

During and after disappearing of Neothetyan oceanic lithosphere between central Iran and Arabian plates in lower Triassic to upper Cretaceous, two volcanic domains were formed in Iranian plateau: NW-SE trend Urumieh-Dokhtar zone and E-W trend Alborz zone.

Alborz volcanic domain in North Iran was formed in a shallow-depth sedimentary basin with hundreds square kilometers in areas. The oldest deposits in this basin are as follows: shales, siltstones, sandstones, conglomerates and also a few carbonates and evaporates. Moreover, acidic and intermediate explosive volcanism in the basin produced different pyroclastic and epiclastic deposits (green tuffs). The shallow depth of the basin is verified by some sedimentary structures including graded bedding, cross bedding, trace fossils, rock balls and microfaunas (e.g., Nummulites sp., Nummulites globules, Discocyclina sella and Actinocyclina sp.). Such a basin was uplifted and disappeared by compression forces in upper Eocene-lower Oligocene. This conclusion is verified by various tight folds in pyroclastic deposits and angular unconformity with overlying lava flows.

The effusive volcanism in the Alborz zone continued subaerially and outpoured different basic to acidic lava flows. Alakaline and shoshonitic nature of this volcanic rocks and other characteristics such as negative anomaly of high filed strength elements (especially Nb, Ti), enrichment in LREEs and also positive K and Pb anomalies show that these volcanic province have been produced in a volcanic arc far away the continental collision between Iranian and Arabian plates.