

Eocene subduction to collision-related volcanism in the Arasbaran area (NW, Iran): evidence for progressive evolution of mantle sources

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The Arasbaran region belongs to the hinterland of the Arabia–Eurasia collision zone within the broad Alpine–Himalayan orogenic belt, and it is characterized by an intense Upper Cretaceous–Cenozoic subduction to collision related magmatism. The magmatic activity records two main volcanic episodes describing a progression from deep to shallow marine and subaerial volcanic activity: i) an old Eocene sequence consisting of lava flows and lava-pillows with mildly alkaline and shoshonitic affinity and ii) a recent Upper Miocene–Quaternary phase.

We focus on the product of the older phase of activity sampled from two main volcanic successions occurring in three distinct areas in the Arasbaran region. Products show wide compositional variation from shoshonite to tephrite and phonolite lavas depicting distinct geochemical trends well correlated with the relative stratigraphic position and petrography.

In detail, major and trace elements suggest the existence of similar mantle sources characterized by various degree of melting for the two successions. Moreover, Pb-isotope ratios show distinct values for the two groups depicting a single trend within the non-HMU type OIBs field. This suggests an evolution with time of the mantle sources with a progressive involvement of components characterised by more radiogenic values.