



Interaction of a mantle plume's heads and continental crust under conditions of within-plate deformations: evidence for the NW of Arabian plate

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Widespread occurrence of the late Cenozoic basaltic volcanism in north-eastern Arabian Peninsula suggests an existence of a mantle plume head here; fragments of its matter (mainly spinel lherzolites) often found as xenoliths in the basalts and tephrites. Development of the volcanism occurred simultaneously with formation of major within-plate geological structures: Levant continental transform fault and Palmirides thrust-folded belt. Their formation have been evolved under conditions of subhorizontal stress which was linked with motion of the Arabian plate in the north along Levant wrench fault as a result of opening new zone of oceanic spreading (Red Sea rift) in the south-west. Amplitude of removal is apparently 40 km, and it's shortening on territory of Syria and Lebanon at that 20-25 km; it suggest that appearance of Palmirides linked with S-like curve of the fault on Lebanon territory (Kopp et al., 1994). Thus, combination of two geodynamic factors take place on this territory: (1) ascending of the mantle plume, and (2) independent subhorizontal motion of rigid continental crust. It open up an unique possibility for studying of their interaction.

The Cenozoic within-plate volcanism in the region was began in the late Oligocene and occurred under subaerial conditions during 26 myr till the Historical times. At the beginning it was located in large Syrian-Jordan plateau, including territory of the future Palmirides. However, in the middle Miocene, when Palmirides has begun to rise, eruptions were ceased here, but new areas of basaltic volcanism appeared to the north of it (Aleppo and Shin plateaus). Simultaneously volcanic processes were intensified to the south of it, in the north of the Syrian-Jordan plateau (Hauran-Druze plateau). Hereafter, as the Palmirides was developed, regular migration of basaltic eruptions

occurred to the north and east from them; volcanism to the south of Palmirides practically did not ceased.

It suggests that beneath growing Palmirides appeared large zone of dislocations, where excess of crustal material (about 20-25 km) plunging under moderate angles to the north direction, something like small subduction zone. This zone has gradually penetrated into the plume head, depositing plastic plume material to the north and east direction which coming up to corresponding deposit of magmatic centers. To the south of Palmirides such reorganization was absent and situation has not essential changed in time. Observed linkage in space and time localization of basaltic volcanism and formation of the major Neotectonic structures in the region (thrust-folded Palmirides and Levant transform fault) suggests that the earth's crust in the region has active interacted with the plume's head, predetermining of the character of migration of volcanic activity centers and duration of existence of concrete lava plateaus.