



Caucasian-Arabian syntaxis: deep-seated structure, volcanology, and neotectonics

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Zone of Caucasian-Arabian syntaxis, where Arabian plate as a wedge pushes into southern frame of Eurasian plate, is a part of huge Late Cenozoic Alpine-Himalayan zone collision of continental plates, lasted throughout the Eurasian continent. At that the Greater Caucasus is an edge of the Eurasian plate, raised along the large upthrow fault – the Main Caucasian Fault. This fault, in turn, is a part of the super-fault, stretching from the Kopetdag to the Trans-European Suture Zone (Tornquist-Teisseyre Zone). The Caucasus is limited from its both sides by large depressions of Black and Caspian seas, which "cut off" pre-Pliocene structures both the Caucasus and the Kopetdag; origin of these seas is considered to downward currents in the mantle ("antiplumes").

Feature of the submeridional Caucasian-Arabian syntaxis is a presence of large positive isostatic anomaly, elongated up to its axis, which apparently indicated presence of a mantle plume head beneath it. Belt of the Late Cenozoic volcanism, which begins in the Eastern Anatolia and traced through the Lesser to Greater Caucasus, is confined with the syntaxis zone. Two types of volcanic rocks are represented here: (1) prevailing volcanics of calc-alkaline series, very close in petrological and geochemical characteristics to suprasubduction type, and (2) extensive lava plateaus, formed by basalts of within-plate (plume related) type.

However, subduction zone is absent throughout Caucasian-Arabian syntaxis and relatively shallow earthquakes (50-60 km) are dominated here. We considered that origin of calc-alkaline magmas is associated with interaction between the mantle plume head and crustal material at shallow depths under conditions of deformation at high pressures, leading to melting of the material in the collision zone. Reduction of space in the area of the syntaxis, which occurred during the Late Cenozoic, is about 400 km; such shortening in the absence of subduction was apparently achieved mainly due to tectonic "dissolution" of the crustal material to both sides in front of hard "stop" of the East European Craton under the pressure of the Arabian indenter.

Situation in the region continues to develop now mainly due to deep-seated mantle processes, gradually destroying structure of the pre-Pliocene collision zone on the surface.

Key words: Zone collision of continental plates, Caucasian-Arabian syntaxis, mantle plume head, modern volcanism of "suprasubduction" and within-plate types, no subduction, tectonic "dissolution" of lithospheric material.