



Petrological Features and evolution of Post-Collision Volcanism of the Central Part of the Caucasus Segment (within Georgia)

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The study area is located in the central part of the Caucasus - Asia Minor segment of the Alpine folded belt. The subduction geodynamic situation in the Caucasus segment changed to a collision 11 Ma ago in conditions of convergence of the Africa -Arabian and Eurasian continental lithospheric plates, followed by the closure of the Mesozoic ocean Tethys with its oceanic type crust.

The first powerful paroxysm of collision subareal volcanism in the central part of the Caucasus segment occurred in the volcanic area of South Georgia at the end of the Miocene. The initial stage of its volcanic activity begins with the eruption of pyroclastic material and ends with the eruptions of lava material. The products range in composition from basalts to rhyolite. Andesites and dacites are predominant. The second cycle of volcanic paroxysm begins in the Late Pliocene, starting with the eruption of thick areal doleritebasaltic lavas on the Javakheti Plateau – the volcanic area of South Georgia ends with the eruption of lavas of andesitic composition and their pyroclasts. The volcanic processes in the South Georgian volcanic area end in the Middle Pleistocene by the formation of dolerite-basaltic and andesitic lava flows.

Volcanic activity in the folded system of the Lesser Caucasus started in the Late Pliocene with the eruption of basalts, andesitebasalts, andesites and their pyroclastic equivalents. Andesites are predominant.

Late Miocene volcanism is manifested mainly in the Transcaucasian intermontane area. All volcanic products of the cited area correspond to subalkaline (rarely alkaline) basalts, being represented by short lava flows and their pyroclastic equivalents. The subalkaline basalts of the Transcaucasian intermontane area are close to continental lithospheric intraplate basalts.

Volcanism in the folded system of the Greater Caucasus is confined to two enormous regions including the Kazbegi and Keli plateau provinces. The magmatism occurred in 5 episodes at: Late Pliocene, Early Pleistocene, Middle Pleistocene, Late Pleistocene and Holocene. At all the episodes of the occurrence of volcanism the composition of the products of eruption is similar, corresponding to mediosilicic and acid volcanites.

The Post-Collisional volcanic history of the study area is characterized by major calc-alkaline to mildly subalkaline volcanism. The age of the main phase of volcanic activity is based on K/Ar geochronology and morphological methods. The volcanites are of relatively homogeneous Sr-isotopic composition ($^{87}\text{Sr}/^{86}\text{Sr}=0.703\text{-}0.704$). These data correspond to the isotopic values of strontium of a “common” mantle type ($^{87}\text{Sr}/^{86}\text{Sr}=0.7035$). On one hand, this confirms the essential role of mantle reservoirs in the petrogenesis of the region volcanites, and on the other hand, insignificant pollution of mantle magmas at the expense of the contamination of granite-metamorphic material. The volcanic rocks of the region under study is characterized by enrichment of LILE, LREE elements with pronounced depletion of HFSE, HREE elements. Similar contents of the cited geochemical characteristics are typical of subductive magmatism as well, from where the volcanites under study apparently inherit these features.