Main peculiarities of N-Q magmatism of the Greater Caucasus

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Three stages are recognized in young magmatic activity of the Greater Caucasus: Late Miocene, Pliocene, and Quaternary.

Products of Late Miocene stage are confined to the northern and southern margins of the Greater Caucasus, respectively: laccoliths of Caucasian Mineral Waters (CMW) (∼8 Ma) and magmatic complexes of Central Georgian neovolcanic area (6.4-6.1 Ma) (Lebedev et al., 2006). CMW granitoids are represented by high-Mg# granosyenites, granites, and leucogranites with high alkalinity. They show Mo-Sn±Au-W and base metal ore-geochemical signature.

Lavas of Central Georgian area correspond to K-Na subalkali and alkali basalts with high Mg# (0.56-0.67) and elevated Sr, Ba, Nb. Their ore-geochemical specialization has not been defined yet.

Pliocene stage was responsible for the formation of Chegem volcanic center (∼2.8 Ma), several plutonic complexes (Eldzhurta, Dzhimara, Sangutidon, Kyrtyk) (3.75-1.6 Ma), felsic ignimbrites, rhyolites, rhyodacites of NE and W Elbrus area (3.0-1.6 Ma), as well as dacites and rhyodacites of dikes and stocks of Tynnyauz area (2.5-2.1 Ma) (Chernyshev et al., 2011).

Rocks of Chegem center were formed during three main phases: (1) basaltic andesites of Surkh and Krandukh volcanoes; (2) pyroclastic sequences of Upper and Lower Chegem volcanic highlands and Dzhungusus intrusive massif (dacites, rhyolites, trachyrhyolites, granodiorite porphyries); (3) andesites of Kumtyube and Kyugenkaya stratovolcanoes.

Initial and final stages represented by calc-alkaline rocks, whereas second stage was marked by K-Na subalkaline and calc-alkaline rocks. Chegem volcanic center have Pb-Zn±Mo ore-geochemical signatures.

Eldzhurta Massif is made up of K-Na granites and leucogranites, while Dzhimara, Tepli, and Sangutidon massifs consist mainly of calc-alkaline diorites and granodiorites with high Ti and Mg contents. Granitoids of Eldzhurta Massif bear W-Mo-Sn-base-metal signatures, while the Tepli and Sangutidon massifs are characterized by Cu-Mo porphyry specialization.

Products of Quaternary magmatic activity are developed in Elbrus and Kazbek neovolcanic areas. Five phases were documented in the Quaternary activity (950-<30 Ka) of Elbrus. Early-stage rocks are ascribed to calc-alkaline basaltic andesites, dacites, and K-Na trachybasaltic andesites, while later stages produced calc-alkaline rhyolites, dacites, andesites, and K-Na trachyandesites and trachyandesites.

Quaternary volcanics of the Greater Caucasus have Pb-Zn ore-geochemical signature.

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