

Discovery of Neo-Proterozoic relics in Paleogene Adjara-Trialeti belt, Lesser Caucasus: Implication for zircons U-Pb Geochronology

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Within the present structure of the Lesser Caucasus orogen, the Adjara-Trialeti represents a Paleogene rift-folded zone that is spread sub-meridionally from the east of Tbilisi to the west as far as the Black Sea. It is mainly constructed by trachytic and trachytic-andesitic volcanogenic-sedimentary rocks and the peak of volcanic activity in the zone is dated as the Middle Eocene. Plutonic rocks play an important role in the Adjara-Trialeti structure, which are mainly represented by syenite, montzonite and gabbro, also of the Middle Eocene age. The Vakijvari pluton is the biggest formation among them (70 km²), formed in the central part of the Achara-Trialeti belt. It is mostly composed of subalkaline and syenetic composition rocks with pyroxene-biotite and hornblende-bearing varieties. The zircons U-Pb age of the pluton is 43.26±0.72 Ma, which corresponds to Middle Eocene [1]. In the central part of the Vakijvari syenetic pluton, in the Bzhuzha r. gorge, at about 150 m² area outcrops homogeneous, finegrained, dark-coloured body. It is intensely divided into a meter size oval blocks, while the area between blocks is filled with clay. This body is composed of plagioclase (up to 70%), augite (up to 20%), olivine (up to 2%), chlorite (2%), epidote (1%) and volcanic glass (up to 10%). These rocks contain zircon small size crystals of 50-100 μm, which were dated by U-Pb method at the isotopic laboratory of the Department of Geosciences, the National Taiwan University. The result was unexpected, and median age of 28 zircon crystals from the relics is defined as 632±29 Ma, which corresponds to Neo-Proterozoic era. Such a large age interval between the pluton and the relics inside it suggests the difficult geodynamic evolution of the region.

[1] Okrostsvaridze et al., 2018. Bull. Georg. Natl. Acad. Sci., vol. 12, no. 12, pp. 89-99.