Javakheti continental flood basalts, Lesser Caucasus: Reason for mass extinction?

I. BOBROVA[1]*, A. OKROSTSVARIDZE[1]

[1] Institute of Earth Science, Ilia State University, Tbilisi, Georgia (*correspondence: iulia.bobrova.1@iliauni.edu.ge; avtandil.okrostsvaridze@iliauni.edu.ge)

The beginning of Quaternary is marked with continuance of active volcanism on the vast territories of the Caucasus. Starting from the Late Miocene and as far as the end of the Pleistocene subaerial volcanic eruptions have occurred, which resulted in formation of Samtskhe-Javakheti volcanic highland (South Georgia). During Quaternary eastern block of the highland, Javakheti block, has been covered with thick dolerite flow, the so-called Akhalkalaki suit [1]. The lava flows are distinguishable and fully identical petrologically and geochemically on the micro-plateaus of Akhalkalaki, Tsalka, Gomareti, and Dmanisi. Thickness of the flow varies in the range of 100-270 m. Magmatic zircons of Javakheti plateau basalts have been dated by the U-Pb method. The results obtained vary in the range of 2.4-1.6 Ma [2].

The formation of these flood basalts coincides in time with the beginning stage of hominid evolution in the region. The early Paleolithic site of Dmanisi (1.85-1.78 Ma) [3] is famous for Homo erectus remains' discovery. The strata deposits of the excavation site contains signs of serial volcanic ash falls, which indicates that volcanism was a factor of big ecological importance in the region during the given period.

Based on the data from analyses of the results of geological work conducted at the Javakheti volcanic plateau, we believe that the upper segment of the plateau represents typical continental flood basalts. [4] During the pulsating formation of these flood basalts, large amounts of poisonous gases (CO_2 and SO_2) were released. This should have had a catastrophic effect on the environment, habitats of the region and Dmanisi hominins among them, which is indicated by numerous fossilized fauna locally associated with the flood basalts.

[1] Skhirtladze (1958) [2] Yu-Han Chang *et al.* (2013) [3] Ferring *et al* (2011) [4] Okrostsvaridze (2011).