ZIRCONS U-Pb DATING RESULTS

The dating the zircons of Mtkvari volcanic pyroclastic flow was done at National Taiwan University, by U-Pb method, using LA-ICP–MS equipment. The samples were taken from three main parts of the flow: in the end of the flow (at 35 km), near the Khertvisi castle (13GEO-04), in the central part of the flow (at 15 km) near the Vardzia cave city (13GEO-05) and at the beginning of the flow (at 2 km) near the Arzameti castle (13GEO-06). It was dated 72 zircon grains (Fig. 5 and 7). The results are as follows: 13GEO-04 = 7,500.42 Ma; 13GEO-05 = 7,540.21 Ma; 13GEO-06 = 7.52 0.21 Ma (Fig. 7). Thus, according to this dating, the Mtkvari volcanic flow represents the Late Miocene formation (av. 7.52 Ma).

VARDZIA CAVE CITY

Cave city of Vardzia is in carved in the central part of the Mtkvari volcanic flow, in the 12th century. It combines urban, defensive and monastic functions and is one of the most important monuments of Georgia cultural heritage. Vardzia had 13 floors and more than 500 cave rooms (Fig. 8). In 1283, after a strong earthquake, the cave city was severely damaged, but did not cease its operation. In 1889, Vardzia was included in the UNESCO World Heritage list together with Khertvisi castle.

DESTRUCTIVE PROCESSES OF VARDZIA CAVE CITY

The results of the geological investigation which was conducted by us [5], showed that the Vardzia area has a complex geological structure (Fig. 9). It is situated on the eastern slopes of the Erusheti ridge and is hewn into the 900 m long tectonic block, which is detached from the main rocks and is gradually subsiding towards the Mtkvari gorge (Fig. 10). In addition, the Vardzia block is split into several microblocks by a joint set and thereby its stability lessens (Fig. 11 and Fig. 12). The matter is made worse by the fact that the active deep fault runs along the Vardzia city, in the Mtkvari gorge and presents a potential earthquake source. It is clear that the important monument of the World cultural heritage is in danger of natural gradual destruction and earthquake hazards.

REFERENCES