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Glacial landforms and deglaciation stages in the Jablanica Mountain, Macedonia, Central Balkan Peninsula

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In the field of Quaternary climate change in Macedonia our project is expected to provide glacier reconstructions coupled with new cosmogenic in-situ produced ^{10}Be exposure ages of glacial landforms enabling a more precise estimation of the timing and extent of glaciations in the region. Several studies addressed the coastal ranges of the Adriatic Sea using U-series dating of the calcite cement of moraines, but scarce data are available for the inland areas of the Balkan Peninsula e.g. preliminary ^{10}Be dating results in the Šar and Pelister Mts.

Geomorphological mapping and glacier reconstruction has started in the Jablanica Mt. The peak elevations are at 2100-2200 m asl, cirque floors are at 1850-2000 m asl, with clear glacially sculptured landscape down to ∼1100 m asl. Moraines of the highest cirque glaciers or glacierets are as high as ∼2030-2070 m asl. At least four deglaciation phases were identified in the field, with several sub-phases. Age determination of these landforms using in situ produced cosmogenic ^{10}Be will shed light on the timing of the deglaciation in the area. The main questions are the age of the largest glacier extent, whether it coincided with the LGM or occurred in an earlier glacial phase. The new age data of the smallest glacial landforms will probably help to decide the debated question of the existence of Younger Dryas (and Holocene) glaciations in the area.

Further mapping, reconstruction and age determination is planned in the Jakupica and Šar Mts. aiming at a regional picture on the deglaciation of the Central Balkan Peninsula. These data will enable to reveal the how climate change affected the region, representing a transition zone between the Mediterranean and Central Europe.

The proposed research will provide new opportunities for the understanding of the Quaternary geomorphological evolution and climate change in the Central Balkan Peninsula in the framework of a launching project: Geochronology using Cosmogenic nuclides in Macedonia (GeCosMa). The second focus of this project will be to trace cave evolution and related river incision in Macedonia using burial age determination of cave sediments using the in situ produced cosmogenic nuclide pair of ^{26}Al and ^{10}Be. The new data will shed light on the timing of draining of the Pliocene-Pleistocene lakes, which is most probably the date of the onset of differential uplift in the region. Numerical ages will allow the quantification of Quaternary incision rates in the Central Balkan Peninsula, and help to settle a reasonable uplift rate in the area and exclude contradictory data.

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