



Fluvial response to glacial dynamics in the Dinaric mountain karst during the Late glacial period

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The Dinaric karst is one of the most typical karst areas in the world where the karst phenomena are widespread and well-developed. This area is also particularly interesting because its mountainous parts experienced glacial conditions during the Quaternary cold stages and hence a glaciokarst type of landscape developed. The Snežnik Mountain (1796 m asl) in the southern part of Slovenia is a high karst plateau that shows significant glacial modification with the majority of glacial deposits being deposited between 900 and 1200 m asl. Here we present a study of the Praprotna draga closed depression, which is one of the largest karst depressions in Snežnik with an area of approximately 3.4 km² and a maximum depth of 140 m. Its western slopes are characterized by undulated moraine morphology and alluvial fans starting from bellow moraines are filling the entire floor of the depression. This study aims to improve understanding of spatial and chronological relationship between glacial, paraglacial and ice-proximal outwash dynamics in the Dinaric karst environment. Therefore, we reveal the origin, geometry and age of deposits in Praprotna draga using geomorphological, sedimentological, geophysical and cosmogenic dating approaches. The spatial distribution and geometry of moraines point to two glacial advances with an altitudinal difference of about 140 m. This two-phase interpretation is also supported with the electrical resistivity tomography (ERT) measurements performed along one of the alluvial fans, which show a diamicton-like sedimentary body buried below alluvial deposits. Another ERT profile was measured over the moraine ridge in order to obtain the significant resistivity values of till deposits in this area and compare them with resistivity values of diamicton buried bellow alluvium. Alluvial deposits in the mid fan zone were sampled for cosmogenic ³⁶Cl analysis of amalgamated carbonate pebbles. The depth profile of ³⁶Cl concentrations leads to a minimum age of the alluvial deposit of 11.7 ± 1.2 kyr when assuming no denudation and up to an age of 13.9 ± 2.2 kyr for 30 mm/yr of soil denudation. This suggests the alluvial material was deposited during Late glacial period, in transition from glacial to non-glacial conditions, and subsequently allow us to interpret the timing of the final glacier retreat in the Snežnik Mountain.