

## Fluvial System Response to Pleistocene Glaciation in a Mediterranean Mountain Karst

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The fluvial morphosedimentary records of Mount Orjen, western Montenegro have been used to investigate the response of Mediterranean river basins to Pleistocene glaciation. A range of depositional contexts at 12 sites have been analysed, including: terraced alluvial valley fills, poljes and alluvial fans. These are set within a limestone karst terrain and are broadly representative of the depositional environments found within glaciated catchments across the Mediterranean.

The timing of fluvial activity has been constrained using detailed stratigraphical analysis, 35 U-series dates, calcite micromorphology, and soil profile analysis. The fluvial record is in good agreement with the Pleistocene glacial history of Mount Orjen (Hughes *et al.*, 2010). Two main phases of Pleistocene fluvial sedimentation have been identified in the morphosedimentary record. The most extensive phase is correlated to MIS 12 (Kotorska-Sušica Member) and is characterised by the infilling of large depocentres beyond the MIS 12 ice margins. The next recorded phase is correlated to MIS 6 (Krivošije Member) and contains only limited evidence of fluvial activity. Fluvial morphosedimentary evidence from MIS 5d-2 has not yet been observed in the study area.

The limestone karst of Mount Orjen has exerted an important influence on meltwater pathways and sediment delivery from the Orjen ice cap over successive glacial cycles. Evidence suggests that since MIS 12 sediment supply to the fluvial system has declined in accord with the decreasing magnitude of glaciation. Subterranean karst flows have increasingly dominated over surface flows and the Pleistocene glacial and surface fluvial systems have become progressively decoupled. Two types of surface meltwater routes dominated during MIS 12: Type 1 – steep sided limestone bedrock gorges; and Type 2 - alluvial channels draining directly from the ice margin. These contrasting pathways have distinctive sedimentological signatures. This study is one of the first attempts to directly correlate Pleistocene glacial and fluvial records in a range of depositional contexts at the landscape scale.

Hughes, P. D., Woodward, J. C., van Calsteren, P. C., Thomas, L. E. and Adamson, K. R. (2010) 'Pleistocene ice caps on the coastal mountains of the Adriatic Sea' in *Quaternary Science Reviews* 29(27-28) 3690-3708