

River system response to Pleistocene glaciation within a Mediterranean landsystem

K. R. Adamson^{a, b}, J. C. Woodward^a and P. D. Hughes^a

^aQuaternary Environments and Geoarchaeology Research Group, Geography, School of Environment and Development, The University of Manchester, Manchester, M13 9PL, UNITED KINGDOM

^bGeography, Queen Mary, University of London, Mile End Road, London, E1 4NS, UNITED KINGDOM

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 meltwater pathways and depositional contexts at 12 sites have been analysed. These include terraced alluvial valley fills, poljes and alluvial fans, which are broadly representative of glaciated river basins across the Mediterranean. The nature and timing of fluvial activity has been determined using detailed sedimentological and stratigraphical analysis, 35 U-series dates, calcite micromorphology, and soil profile analysis. This study is one of the first attempts to directly correlate Pleistocene glacial and fluvial records within the context of a single landsystem.

The fluvial record is in good agreement with the Pleistocene glacial history of Mount Orjen. The most extensive phase of alluviation is correlated to MIS 12-8 (Kotorska-Sušica Member) when the large depocentres beyond the maximum ice margins became infilled. There is only limited evidence of fluvial activity during MIS 6 (Krivošije Member) despite extensive glaciation at this time. Fluvial morphosedimentary records from MIS 5d-2 have not yet been observed in the study area. Since MIS 12 meltwater and 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. Importantly, neighbouring basins surrounding Mount Orjen often contain contrasting records of Pleistocene river dynamics and/or preservation of the fluvial archive. These findings have important implications for our understanding of Pleistocene river system dynamics within glaciated catchments in the Mediterranean and elsewhere.