Bringing pieces together: What multiproxy records from cave sediments can tell us about human dynamics in relation to past environmental changes in the Western Romanian Carpathians?

Aritina HALIUC[1]*, Andrea DEMJÉN[2], Călin GHEMIŞ[3], Lőrincz ADRIENN[4], Răzvan DUMBRAVĂ[5], Adriana VULPOI[6], Beatrice S. KELEMEN[7], Augustin NAE[8], Ioana RUSU[7], Viorel T. LASCU[9], Florin GOGALTAN[10], Bogdan P. ONAC[11], Ioana N. MELEG[6]

[1]*University of Suceava, Geography Department, Romania*
[2]*National Museum of Transylvanian History, Cluj-Napoca, Romania and Emil. G. Racoviţă Institute, Babeş-Bolyai University, Cluj-Napoca, Romania*
[3]*Criş Country Museum - Oradea, Romania and Emil. G. Racoviţă Institute, Babeş-Bolyai University, Cluj-Napoca, Romania*
[4]*Babeş-Bolyai University, Cluj-Napoca, Romania*
[5]*University of Oradea, Faculty of Geography, Tourism and Sport, Oradea, Romania and Emil. G. Racoviţă Institute, Babeş-Bolyai University, Cluj-Napoca, Romania*
[6]*Emil. G. Racoviţă Institute, Babeş-Bolyai University, Cluj-Napoca, Romania and Interdisciplinary Research Institute on Bio-Nano-Sciences, Babeş-Bolyai University, Cluj-Napoca*
[7]*Molecular Biology Center, Interdisciplinary Research Institute on Bio-Nano-Sciences, Babeş-Bolyai University, Cluj-Napoca, Romania and Department of Molecular Biology and Biotechnology, Faculty of Biology and Geology, Babeş-Bolyai University, Cluj-Napoca, Romania and Emil. G. Racoviţă Institute, Babeş-Bolyai University, Cluj-Napoca, Romania*
[8]*Emil Racoviţă Institute of Speleology of the Romanian Academy, Bucharest, Romania*
[9]*National Institute for Research and Development in Environmental Protection (INCDPM), Bucharest, Romania*
[10]*Institute of Archaeology and Art History, Cluj-Napoca, Romania*
[11]*Karst Research Group, School of Geosciences, University of South Florida, Tampa, USA and Emil. G. Racoviţă Institute, Babeş-Bolyai University, Cluj-Napoca, Romania*
* Corresponding author: Aritina Haliuc. E-mail: aritinahaliuc@gmail.com

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Cave sediments are natural repositories that store geochemical and palaeobiological information and sometimes archaeological materials, thus providing evidence of past changes in the environment and clues of human activities over long temporal scales. Caves from Romanian Carpathians hold tracers of early human occupation and past environmental dynamics, but they are still poorly investigated. Thus, the region remains at the periphery of research, missing direct investigations about the timing of ancient human dynamics in relation to past ecosystems. Undisturbed cave sediment records of 128 and 20 cm in length, along with point samples were collected from two caves located in the Apuseni Mountains of western Romania. One of the caves host human footprints dating back to cca 36 ka, whereas the other one is known for its Bronze Age burial site. In the latter, excavation is in progress and the geochronological context of early human settlements has been assessed based on radiocarbon dating of human and seed remains. Surprisingly, the oldest traces of ritual deposits date back to the Middle / Late Neolithic around 7 ka BP. By using a multidisciplinary approach that combines chronology, lithostratigraphy, geochemistry, ancient DNA, and a detailed archaeological survey, this study aims to reconstruct Late Pleistocene/Holocene faunal and human population turnovers within a palaeoclimatic and palaeoenvironmental context at

different spatio-temporal resolutions. The preliminary results show that the 128-cm long record goes back to mid-Holocene and the depositional environment is characterised by different phases of sedimentation in response to climate and environmental changes. Multi-proxy analysis is now under investigation and the results will extend the faunal, human, climate, and environmental perspective deeper in time. Exploring such evidence is of cultural and scientific significance especially in SE Europe where early and unique human records are found. Furthermore, it is critical for advancing our understanding of past human dynamics and changes in the environments.