Stratigraphy, depositional and post-depositional processes at the Paleolithic cave sites in Central Asia

The area of Central Asia constitutes recently a center of research on human evolution and development of Paleolithic cultures. It is particularly due to discoveries made in the last two decades, concerning both lithic industries and fossil human remains. The most important archaeological achievements include the redefinition of regional Mousterian facies; the identification of the local Upper Paleolithic, similar to the Near Eastern Aurignacian; as well as the recognition of the continuity of the Epipaleolithic tradition in the region, lasting from final Pleistocene to Middle Holocene. On the other hand, DNA analysis of human fossil remains confirmed the Neanderthal affinity of bones from several sites, and unexpectedly enabled the discovery of "Denisovan Man" – a new hominid species. This revealed the wide complexity of the paleoanthropological history of this part of the world. Despite these important discoveries and the undoubted significance of Central Asia in the development of both Paleolithic cultures and human evolution, the geological context of important archeological and anthropological finds in Central Asian caves still remains weakly recognized. This implies the limited knowledge on both the homogeneity of sedimentary layers, and the integrity of archaeological and anthropological assemblages preserved there. The necessity of a detailed recognition of these phenomena constituted a basis for this project.

The main objective of this project is the establishing of the geological context for the cultural layers of selected Central Asian archaeological and anthropological cave sites, and the determining of the potential mixing of sediments between layers, the intensity and directions of that mixing. The project is focused on several karstic areas where the caves occur: the margins of Ferghana Valley – north slopes of Alay Mountains (Kyrgyzstan) and west of Tian Shan (Uzbekistan); and the northern piedmont of Altai Mountains in the Russian Altaiskiy Krai.

For the purposes of the project, the multi-proxy analyzes of the depositional and post-depositional processes in the studied caves will be implemented, particularly focused on these geological processes that could disturb the original structure of cultural layers and archaeological assemblages. In modern geochronological approach, it is crucial to establish the sedimentological details as a basis for stratigraphic and chronological interpretation, especially if we are aware of the possible re-deposition and sediment mixing. This is particularly important in the case of near-entrance cave deposits, where the chronological discrepancy between the moment of sediment deposition and age of its components (such as archaeological material) is often observed. The tasks of this research project include: reconstruction of sedimentary and post-sedimentary processes in caves; building the stratigraphic schemes for studied caves, based on the lithological variability, paleoclimatic conditions and estimation of geological age; restoration of paleoenvironment around the caves during different periods of the Paleolithic (including climate and climatic changes, but also local and regional geomorphological events).

Investigation of the Sel'Ungur Cave's sedimentary profile, Kyrgyzstan.

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