



Early Pleistocene climate and environmental change in Armenia – reconstructing temporal corridors of early human expansions

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Armenia is situated in the Lesser Caucasus, between the marine climate to the west, influenced by the Atlantic Ocean circulation, and the today well established continental climate to the east, this area is of crucial interest for understanding the global climate system and its influence on vegetation and landscape evolution. Moreover, the Caucasus is the oldest area of human occupation in Eurasia.

For the reconstruction of Early Pleistocene landscape evolution in the Caucasus the Vorotan basin proved to be a rich area for palaeobotanical and palaeontological studies. There, lake sediments form huge diatomitic sequences that are perfectly suitable for palaeoenvironmental studies. The highly precise age control of the sites studied so far is based on palaeomagnetic and Ar/Ar dating and enables us to reconstruct the environmental history of the Early Pleistocene between 1.15 and 0.95 Ma. The sedimentation rate for the diatomite is estimated to be about 20-30 cm per 1000 years, which allows for a resolution of about 250 years per sample.

The profiles show a rich and diverse flora and entomofauna. Some parts of the sequences studied in high resolution show clear cyclicity which can be correlated to global climate cycles. The prominent warm phase MIS 31 at 1.07 Ma is well pronounced in the pollen and macroflora record and linked with a major expansion of the forest belt and a diverse mosaic landscape providing a high variety of habitats and resources to early humans. This time of wide spread forest cover lasted for less than 10 000 years. This rich leaf assemblage was the basis of a quantitative climatic analysis based on the Coexistence Approach yielding clearly warmer and more humid conditions than today. Before and afterwards vegetation was dominated by semi-arid steppes and montane meadows, very much similar to today.

Distinct differences between vegetation development during the two interglacial stages MIS 33 and MIS 31 can be used to define a climatic threshold for the development of habitats suitable to early humans in the Armenian highlands.