



Environmental change and cultural adaptation in the southern Caucasus: latest results from Aghitu-3 Cave, Armenia

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The well stratified locality of Aghitu-3 Cave in the southern Caucasus provides a glimpse into the daily lives of the earliest known Upper Paleolithic inhabitants of Armenia. With three main phases of sedimentation serving as a backdrop to human settlement, the locality provides an excellent stratigraphic record documenting environmental change between about 40,000 and 24,000 cal BP. From the end of MIS 3 with its warm and humid climate, early modern humans made use of the cave with increasing frequency during the colder and drier MIS 2. People produced stone tools from obsidian and chert, hunted medium sized ungulates and equids, and used bone tools to make clothing. The archaeological finds from Aghitu-3 suggest that mobile groups of Upper Paleolithic people used this high altitude (1601 m) cave as a seasonal camp with increasing frequency over time. Carnivores and birds of prey also made use of the cave, likely when humans were not present.

The paleoenvironmental indicators confirm a warmer and more humid climate during the first sedimentary phase between about 40,000 and 33,000 cal BP. At about 35,000 cal BP the pollen profile indicates a vegetation of mixed deciduous and steppic species. The presence of green algae supports the interpretation that more humid conditions prevailed. Geological analysis indicates uniform, fine-grained deposition along the banks of a slow moving stream. This and the general lack of rock falls confirm a warmer and more humid climate. The spectrum of micromammals shows a higher proportion of golden hamster, also supporting a favorable climate. However, starting about 33,000 cal BP, we observe a second phase of deposition characterized by coarser sediment with evidence of rill washing, cycles of erosion and frequent large basalt rock falls. These observations suggest a dramatic cooling trend as the climate began to deteriorate. The third depositional phase starts about 29,000 cal BP and is marked by mainly aeolian deposition consisting of fine silt horizons with alternating layers of frost shattered basalt slabs. Pollen shows a change to boreal forest, and the increased presence of pika among the micromammals suggests colder and more barren conditions than today. The wide spectrum of micromammals further points to their likely accumulation by a non-selective raptor such as eagle owl. Fish remains of brown trout confirm the presence of a significant fluvial corridor, likely the nearby Vorotan River. This agrees with the charcoal remains identified thus far, which have the signature of a riparian woodland. The sedimentary sequence ends here, truncated at about 24,000 cal BP by late Holocene deposits of anthropogenic origin.