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Areni 1 and 2: two new Lower Paleolithic cave sites with core and flake lithic assemblages and faunal remains in Armenia

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Following the discovery of the *H. erectus* fossils and stone tools dating to 1.85–1.78 Ma at the site of Dmanisi in Georgia [1], recent field research in neighboring Armenia has focused on documenting Lower Paleolithic (LP) sites that may provide insight into the behavior of the first hominins to occupy Eurasia. The few LP sites under study in Armenia are all in open-air contexts [2]. Here, we introduce two newly discovered LP sites in karstic cave settings. Areni 1, situated on the left bank of the Arpa River, is globally famous for its Chalcolithic deposits, and their excellent preservation of organic remains that include the world's oldest leather shoe and the earliest evidence of wine production. Between 2007-2014, test trenches were excavated into the platform in front of the cave entrance. 210 LP artifacts associated with heavily mineralized bones were recovered from what appear to be mildly reworked Pleistocene sediments. Resembling those recovered at Dmanisi, the lithic artifacts are categorized as a simple core and flake, or Oldowan assemblage, with high frequencies of choppers or core-tools, flakes, and hammerstones. The assemblage also includes a few technological refits and high frequencies of flakes < 2 cm in maximum dimensions, suggesting low intensity reworking. The toolstones utilized at the site reflect the bedrock geology of the Arpa River catchment, and include a variety of sedimentary, metamorphic, and volcanic rocks. No bifaces (handaxes) or Levallois artifacts have been recovered from excavated deposits. Directly opposite Areni 1, on the other site of the Arpa River, another sequence has been exposed at Areni 2 cave, revealing Medieval, Bronze Age, Chalcolithic, and Neolithic artifacts overlying intact Pleistocene sediments that yielded a core and flake lithic assemblage and fossilized bones. The lithics recovered at this site techno-typologically mirror those recovered at Areni 1 [3], and again no handaxes or Levallois artifacts were recovered. We have initiated a long-term excavation project at the Areni 1 and 2 caves, aimed at documenting and dating the LP archaeology, and investigating site formation processes through detailed sedimentological, geoarchaeological, and chronometric analyses. The project also includes regional geomorphological study, and assessment of paleoenvironmental conditions through the analysis of well-preserved speleothems in deep karstic caves in the area. The Areni 1 and 2 cave sites will almost certainly yield abundant evidence of subsistence and land use behaviors of the earliest hominin occupants of the Armenian highlands. Such evidence is necessary to complement the finds from Dmanisi and other open-air sites in the region and bring into clearer focus landscape-scale adaptive behaviors. Occupation of enclosed sites, as at Areni 1 and 2, is an adaptation that has rarely been observed among the evidence for the earliest dispersals of hominin populations outside of Africa.

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