PREHISTORIC CAVES AND ROCKSHELTERS IN THE MACHY VALLEY, SURKHANDARYA, SOUTH UZBEKISTAN

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1. INTRODUCTION

This paper reports the results of a prehistoric survey conducted by an Uzbek-Japanese archaeological mission in July to August, 2015. The primary objective of this project was to investigate the Paleolithic population dynamics in Uzbekistan using multidisciplinary approaches. This research particularly focused on the Middle and Upper Paleolithic, when one of the most important anthropological events took place: the Neanderthals and their contemporary populations were replaced by anatomically modern humans, who originated in Africa and penetrated Eurasia during the Middle Paleolithic onwards. Uzbekistan is a focal research field for this transition, having yielded a corpus of important human fossil remains from Teshik Tash, Obi Rahmat, and Anghilak [Movius 1953; Viola *et al*. 2004; Glantz *et al*. 2008]. However, the currently available data is insufficient for reconstructing their occurrences, particularly in terms of chronometric data. Along with re-examination of the extant sites, it is also necessary to look for new sites to establish a reliable chronological framework for anthropological and archaeological finds from the Middle and Upper Paleolithic sites.

Our research in the 2013 and 2014 seasons was conducted in the Kashkadarya Valley, where the Middle Paleolithic sites of Anghilak and Aman Kutan are situated [Nishiaki *et al*. 2014, 2016]. In the 2015 season, we chose to focus our research in Surkhandarya Province situated south of the Kashkadarya Valley. The region includes the Machay Valley, where the well-known Neanderthal site of Teshik Tash is situated. The 2015 season of field investigations involved a site reconnaissance survey to examine the potential of this valley for further Paleolithic research (Fig. 1).

2. SURVEY OF THE MACHY VALLEY (TURGAN DARYA), SURKHANDARYA

2.1 Survey region

The Surkhandarya Province is at the southeastern end of Uzbekistan, facing the borders with Tajikistan to the east, Turkmenistan to the west, and Afghanistan to the south (Fig. 1). It also represents the southwestern end of the Alay Mountains, extending westward from the Tian Shan Mountain Range. Along the southern boundary of Surkhandarya is the watercourse of the Amdarya Valley, into which several large and small tributaries run from the north. The largest tributary is the Surkhana Darya. Situated to its west is the smaller Machay Valley, the location of the 2015 survey. Running from northeast to southwest (Fig. 2), the valley ranges in altitude between approximately 1000 to 2500 meters above sea level (masl).

Numerous caves are present in the region (Figs. 2 and 3), and three prehistoric caves have

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been known since the 1930s, Teshik Tash, Amir Temir, and Machay Cave. The best-known cave is Teshik Tash (Fig. 3: 17), where the excavations by A. P. Okladnikov in 1938 and 1939 yielded well-preserved remains of a Neanderthal boy [Okladnikov 1949; Movius 1953]. The results of the excavation of Amir Temir suggested that it may have contained Middle Paleolithic artifacts comparable to the latest assemblage of Teshik Tash, and Machay also may have contained Middle Paleolithic layers [Movius 1953: 17]. Machay Cave was extensively excavated later in the 1970s [Islamov 1975], and these caves were reexamined by a Russian team in the 2000s [Derevianko 2010].

While this valley has been investigated repeatedly, we decided to visit these sites and investigate the surrounding region once again considering that no other valley in this region has yielded such a rich array of information on the Middle Paleolithic. New research of known sites by various teams using modern research strategies not available in early excavations should yield fresh insights on the Paleolithic occupations of this region.

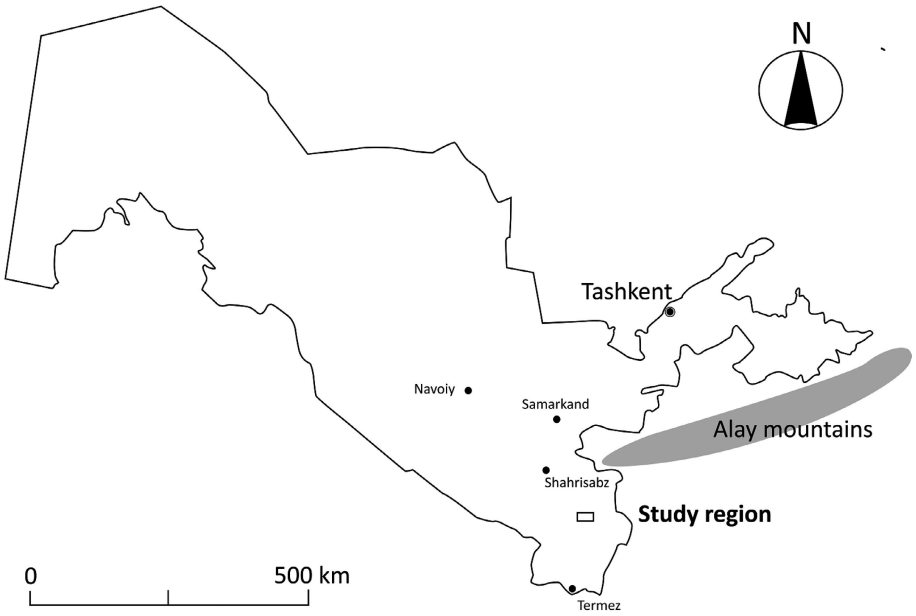

Fig. 1 Map of Uzbekistan showing the survey region of 2015 season

2.2 Survey method

The base camp for the survey was located in the village of Machay (Fig. 2). Numerous caves and rockshelters are situated along the valley's small tributaries. Many sites are situated on the left bank of the valley where limestone beds are the primary formations. In contrast, the right bank further to the west contains a limited distribution of limestone caves. This contrast is explained by the geological formation of the right bank that is dominated by reddish-brown, easily eroded sandstone beds, in which Paleolithic caves, if any, may not have been preserved.

The survey was conducted principally on foot. Following the local guides, known caves and rockshelters were visited, followed by a survey of the vicinity to identify new caves. Geographic coordinates were recorded for all visited caves using a handheld GPS navigator (GPSMAP 60CSx, Garmin Ltd.). Preliminary measurements were also taken using a laser rangefinder (TruPulse 200^{TM}, Laser Technology, Inc.). When sediments were recognized within a cave, we opened one or two small sounding pits (50 × 50 cm up to 2 × 2 m) to examine the stratigraphy. The sediments were dry-sieved with a 3 mm mesh to collect small lithic and faunal remains.

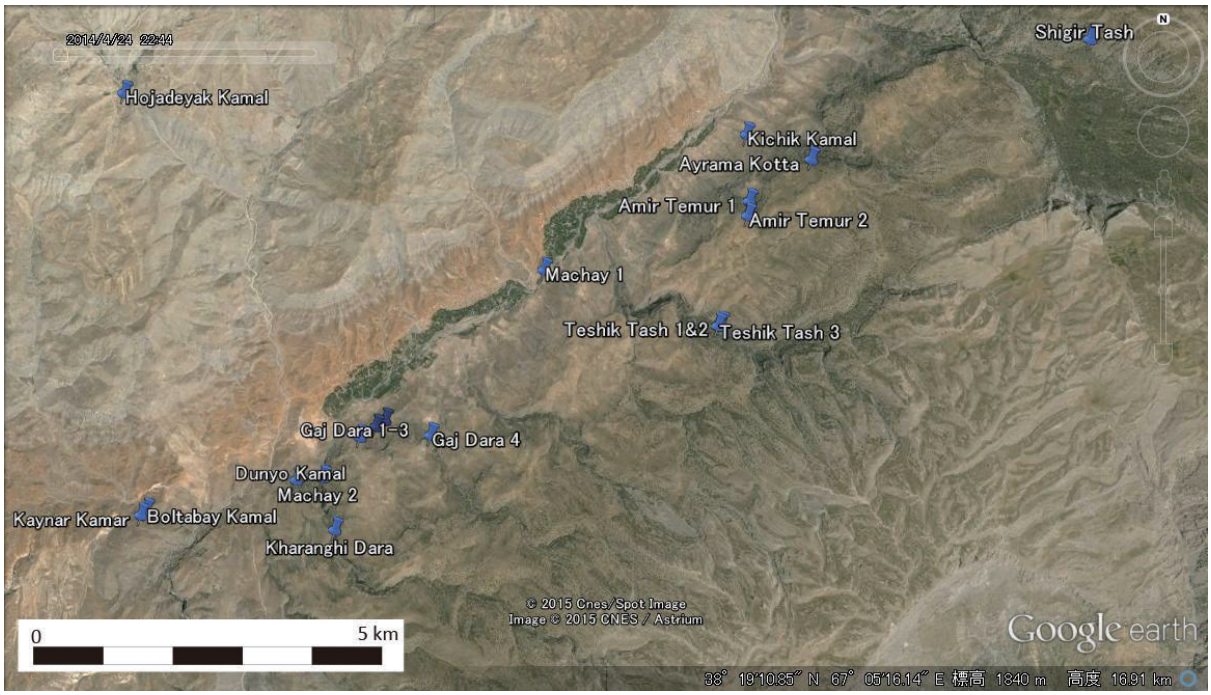

Fig. 2 Satellite image showing the location of caves recorded during the survey

2.3 Survey results

A total of 19 caves and rockshelters were recorded during the survey (Fig. 3; Table 1). These caves can be categorized into three groups: Group 1, previously reported prehistoric caves (Teshik Tash 1–3, Amir Temir 1–2, and Machay 1–2); Group 2, a newly discovered prehistoric cave (Kaynar Kamar); and Group 3, newly discovered caves without evidence of prehistoric occupation (Kharanghi Dara, Shighr Tash, Boltabay Kamal, Dunyo Kamal, Hojadeyak Kamal, Gaj Dara 1–4, Kichi Kamal, and Ayrama Kotta). The reexamination of the Group 1 caves and intensive research at the newly discovered Group 2 cave are regarded as particularly valuable.

Group 1

The previously known caves were our first objective to investigate their geomorphological setting, as well as the possibility of re-investigation. Firstly, we refer to the well-known site of Teshik Tash. The Russian investigations documented that the site represents a group of three caves in close proximity within a single valley [Derevianko 2010: 20–21; Fig. 4]. For the convenience of description, we refer to the cave with Neanderthal remains as Teshik Tash 1 (Fig. 3: 17) and to the others as Teshik Tash 2 and 3 (Fig. 3: 18, 19). Our visit to Teshik Tash 1 confirmed that this important cave no longer had archaeological deposits; all deposits had been removed during or after the excavations, leaving no potential for further investigation. Teshik Tash 2 is about 100 m downstream from Teshik Tash 1. Although it has a larger roofed area, the inner cave surface sharply descends along the valley at approximately 25 degrees. This cave, with rich deposits, was examined by the Russian team in the 2000s and the Uzbek team in 2014. We examined the stratigraphy of the trenches left by these previous soundings. A succession of limestone gravel layers and clayey-brown sediments with only a small amount of rubble were recognized in the 3 m stratigraphy. However, no traces of *in situ* human activities, such as hearths, were identified. The surface sampling yielded only a small amount of artifacts made of siliceous limestone. Teshik Tash 3 is located further downstream about 300 m from Teshik Tash 1, also on the left bank of the valley. It is the second largest cave in this complex. This cave was extensively excavated in 1938 and later. Our surface survey yielded

Fig. 3 General views of the recorded caves. 1: Kharanghi Dara, 2: Machay 1, 3: Machay 2, 4: Shigir Tash, 5: Boltabay Kamal, 6: Kaynar Kamar, 7: Dunyo Kamal, 8: Hojadeyak Kamal, 9: Gaj Dara 1, 10: Gaj Dara 2, 11: Gaj Dara 3, 12: Gaj Dara 4, 13: Kichik Kamal, 14: Ayrama Kotta, 15: Amir Temir 1, 16: Amir Temir 2, 17: Teshik Tash 1, 18: Teshik Tash 2, 19: Teshik Tash 3

Fig. 3 Continued


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Fig. 3 Continued

Table 1 List of caves registered in the study region during the 2015 season

#	Cave	Latitude	Longitude	Altitude	Height	Width	Depth	Notes
1	Kharanghi Dara	38°17′746″ N	67°02′541″ E	1520	12	61	15	Sterile; modern hunting station
2	Machay 1	38°19′813″ N	67°04′643″ E	1358	5.8	19.5	8	Mesolithic; Antique
3	Machay 2	38°18′147″ N	67°02′385″ E	1372	2.9	7.3	5.9	Antique
4	Shigir Tash	38°21′519″ N	67°09′944″ E	2230	–	–	–	Sterile
5	Boltabay Kamal	38°17′879″ N	67°00′561″ E	1323	15.1	32	10.7	Sterile
6	Kaynar Kamar	38°17′841″ N	67°00′508″ E	1329	14	76	7	Antique; Neolithic/Mesolithic
7	Dunyo Kamal	38°18′124″ N	67°02′102″ E	1277	32	67	10	Sterile
8	Hojadeyak Kamal	38°21′218″ N	67°00′383″ E	1452	5	36.6	12.5	Sterile
9	Gaj Dara 1	38°18′473″ N	67°02′761″ E	1345	–	–	–	Sterile
10	Gaj Dara 2	38°18′557″ N	67°02′921″ E	1357	7	20	1	Antique
11	Gaj Dara 3	38°18′605″ N	67°03′015″ E	1370	3	15	1.5	Antique
12	Gaj Dara 4	38°18′492″ N	67°03′500″ E	1489	3.8	30.4	6	Sterile
13	Kichik Kamal	38°20′887″ N	67°06′704″ E	1464	3.1	22	2.7	Sterile
14	Ayrama Kotta	38°20′657″ N	67°07′318″ E	1782	2.7	25	7.8	Sterile
15	Amir Temir 1	38°20′331″ N	67°06′703″ E	1741	3	42	20	Antique
16	Amir Temir 2	38°20′213″ N	67°06′681″ E	1831	2	26	14	Antique
17	Teshik Tash 1	38°19′372″ N	67°06′409″ E	1930	7	10	23	Middle Palaeolithic
18	Teshik Tash 2	38°19′372″ N	67°06′409″ E	1875	13.2	49	14.8	Middle Palaeolithic?
19	Teshik Tash 3	38°19′357″ N	67°06′384″ E	1831	6	16.5	13	Middle Palaeolithic?

virtually no reliably identifiable Paleolithic artifacts.

Also representing Group 1, Amir Temir is situated at one of the most significant headwalls of the Machay Valley (Fig. 5). The headwall is located at the end of a large fissure overlooking the valley source, which is comprised of high limestone cliffs more than 100 m high on both sides. There are at least two large caves on this cliff: Amir Temir 1 and 2 (Fig. 3: 15. 16). Natural water pools are present in both year-round. While both caves contain a certain amount of sediments, the one reported by Okladnikov is Amir Temir 2. According to the description by Okladnikov, the lowest horizon of the cave deposits, more than 1 m from the surface, was assigned to the Middle Paleolithic. Our examination showed that the corresponding part of this horizon is comprised of several geologically discernible layers, all of which contain abundant limestone rubble. However, reliable traces of primary human activities, such as the hearths reported by Okladnikov [Movius 1953], were not identified. Flaked limestone pieces similar to those illustrated by Okladnikov were also recovered, but the assemblage contained few artifacts.

Fig. 4 The valley of Teshik Tash

There are at least two more caves known near the village of Machay. We provisionally refer to Machay 1, discovered in the 1930s and excavated in 1970–71 by I. Islamov [1975], and Machay 2, discovered by A. Rajabov and B. Sayfullayev in 2014 (Fig. 2; cf. Rajabov 2017). Machay 1 opens at the top of a steep slope facing the main stream of the Machay Valley to the south (Fig. 3: 2). Okladnikov mentioned that an elongated triangular point reminiscent of the Paleolithic was recovered from this cave in the 1930s [Movius 1953: 17]. However, the later extensive excavations conducted by Islamov [1975] revealed that this cave is principally a Mesolithic site. To confirm this interpretation, we examined the remaining deposits. The central part of the cave floor is covered with large rocks that have fallen from the roof (Fig. 6). Therefore, as only narrow areas on both sides of the cave were available for examination, we opened two sounding pits. However, none of them reached intact deposits due to either a tremendous quantity of accumulated rubble or the thorough excavations conducted in 1970–71.

Fig. 5 The valley of Amir Temir

Machay 2 is situated about 2 km southwest of the village (Fig. 3: 3). It is a low vaulted cave with a narrow terrace of 7 × 3 m. The cave mouth is nearly closed with fallen rocks. The renovated research by the Uzbek team in 2014

Fig. 6 Investigations at Machay Cave 1

concentrated on the terrace, where a small test pit was opened. Results showed that the remaining sediments in the terrace were thin, less than 30 cm. A small quantity of possible lithic artifacts of unknown periods was recovered. We removed part of the fallen rocks from the cave mouth and opened a new pit of 50 × 50 cm in the interior area. The stratigraphy of only ca. 50 cm shows that the upper half was filled with abundant limestone rubble, and the lower half contained finer clay sediments. Although Rajabov (2017) reports on Upper Paleolithic artifacts from this cave, no stone artifacts or charcoal remains were recovered in either of these two layers of our pit. However, some potsherds of the Antique period collected on the surface indicate that this cave was certainly used in the past.

Group 2

This group contains only one cave, called Kaynar Kamar, which is the single cave site confirmed during the survey to have substantial prehistoric occupational records. It was discovered when we were guided to Boltabay Kamal Cave, located at a tributary of the Machay Valley west of the Machay village. The tributary runs through a deep and narrow gorge and opens into a hilly area at its source, where this rockshelter is situated (Fig. 7). A permanent water source is located nearby.

Fig. 7 Distant view of the rockshelter of Kaynar Kamar

This rockshelter, whose floor is approximately 15 m above the riverbed of the tributary, has a roofed area of 70 m long and 7 m wide at its maximum. We opened two trenches, A and B (Fig. 8). Trench A, measuring 2 × 2 m, was set up close to the wall, while Trench B (1 × 2 m) was located closer to the terrace edge. The latter trench is also closer to the spring. The sediments were dry-sieved with a 3 mm mesh. The excavations of Trench A reached a depth of around 2 m, but did not reach bedrock. The area closer to the cliff contained numerous fallen rocks, while the opposite side contained well-stratified sediments with less rubble. The stratigraphy shows that the upper part, about 1 m thick, contained potsherds and other artifacts dating to the Antique period, but the lower part was aceramic. The aceramic layer contained flint artifacts and numerous animal bones in association with a few patches of ash and charcoal.

On the other hand, Trench B was excavated down to ca. 1.5 m deep, without reaching bedrock. As in Trench A, the upper part contained Antique remains, and the lower part was aceramic. The aceramic deposits were composed of at least two layers, both of which contained lithic artifacts and animal bone remains but no hearth or ash concentrations. In addition, the lithic artifacts show weathered surface conditions, seeming to be secondary deposits, originating from an area somewhere closer to the wall.

The lithic assemblages of Trench A and B, both limited in number, exhibit different techno-typological features (Fig. 9). While the Trench A assemblage consists of amorphous flakes and flake tools, that from Trench B is quite microlithic, containing a small number of bladelets and retouched bladelets. These observations suggest that the our soundings in Trench B may have reached the Neolithic or Mesolithic, and those in Trench A a more recent period in prehistory. Needless to say, the precise assessment of their chronological and cultural positions should be discussed when the sample size increases after future excavations. It should also be noted that virgin soil or bedrock has not been reached in either of these trenches.

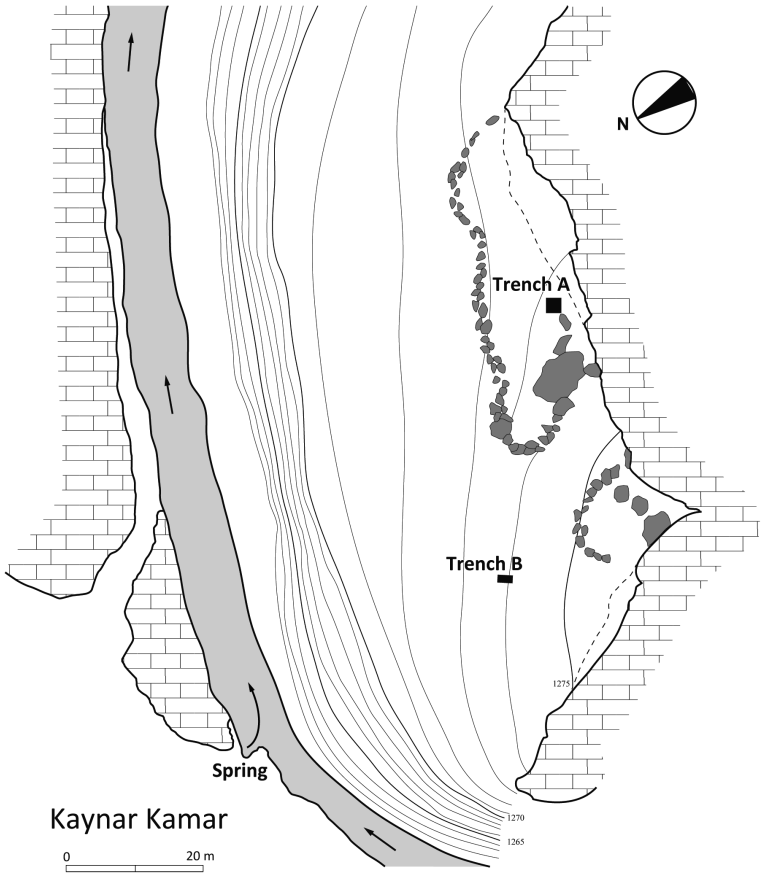

Fig. 8 The location of test pits at Kaynar Kamar

Fig. 9 Lithic artifacts recovered from Kaynar Kamar. Top: Trench A, bottom: Trench B.

Group 3

The last group represents caves newly discovered but without evidence of prehistoric occupations, constituting the largest group among the survey sites. Those caves include caves displaying

geomorphological settings comparable to those of the known prehistoric caves, such as Teshik Tash. Nevertheless, prehistoric remains were not recognized. This observation suggests that prehistoric occupational traces at these caves, if any, have disappeared due to local geological factors, including strong water flows brought by seasonal heavy rain and snow, and tectonic processes characteristic of this part of the mountain range encompassed in an active orogenic system (Nishiaki *et al*. 2016: 10). The Group 3 caves indeed display rather fresh physical conditions, such as rugged wall surfaces and extensive limestone rubble on the floors, indicating that erosional processes continue today [see Movius 1953: 17]. This interpretation partly explains why no new cave sites have been discovered in this valley since the 1930s, despite repeated field surveys conducted by different teams. Thus, it seems not to be an easy task to discover Paleolithic cave sites in this valley.

3. CONCLUSIONS

Our survey in the Machay Valley aimed to visit previously known and unknown caves to evaluate the potential of this valley for more intensive prehistoric investigations in the future. Results suggest that many of the caves in this valley have endured a considerable amount of erosion, which likely removed traces of Paleolithic human occupation. The erosion seems to have occurred due to active tectonic processes, as well as fluvial processes generated by extensive snow and rainfall in the mountain ranges of this part of Uzbekistan.

In this context, the previously known caves of Teshik Tash, Amir Temir, and Machay were especially attractive for research. However, our survey shows that they have insufficient anthropogenic deposits available for further investigation. Consequently, it is important that the rockshelter of Kaynar Kamar was newly discovered as a prehistoric site worthy of future investigation. This is the first discovery of a new cave site in the Machay Valley since the 1930s. Our preliminary excavations have yielded cultural layers, perhaps from the Neolithic/Mesolithic or later periods. Although no evidence of Paleolithic occupation has been obtained, such evidence may exist in the lower deposits not excavated this season. Regardless, the discovery of a Neolithic/Mesolithic cultural sequence is in itself significant if it can be confirmed, given the sparse research history of this period in Uzbekistan. It would also make a substantial contribution to a better understanding of the Paleolithic population history of this region with a longer chronological perspective.

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