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The Paleolithic sites in the Uliin Tokhoi (Central Mongolia): Result of Excavation and Survey research

Abstract: The Tuul River valley, one of Mongolia's major river systems, has seen relatively little research on Paleolithic stone tool assemblages. As part of the "Stone Tool Sites in the Upper Tuul River Region" (2023–2024) project, a survey and excavation were conducted in 2024 at Uliin Tokhoi, with the objective of identifying new Paleolithic sites. Test excavations at three areas within the site yielded 100 lithic artifacts, while an additional 120 artifacts were surface-collected from 34 locations. Excavations revealed a primary artifact concentration between 0.8 m and 1.3 m below the surface, with no artifacts found beneath this stratigraphic layer. All artifacts exceeding 2 cm in length were systematically recorded. Sampling and fieldwalking surveys were the primary methods used for surface investigation. The lithic assemblage predominantly consists of blade-core reduction flakes, end scrapers, burins, knives, and perforators, characteristic of the Upper Paleolithic. Comparative analysis with dated sites in Mongolia and neighboring regions suggests that the site likely belongs to the Early and Initial Upper Paleolithic.

Keywords: *Mongolia, initial upper paleolithic, early upper paleolithic, core, tool, technology.*

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Introduction

Despite it being a major river in the central region of Mongolia, the Paleolithic archaeological record along the Tuul River valley remains relatively underexplored. Initial archaeological exploration of of the Tull River valley took place between 1960 and 1966, as part of the Mongolian-Soviet Joint Historical and Cultural Expedition. Led by A.P. Okladnikov and D. Dorj, their research efforts focused on surveying and recovering lithic artifacts indicative of early human activity in the region. Notable findings included a limited assemblage of Paleolithic stone tools collected from key locations near Ulaanbaatar, such as Songino Mountain, Buyant Ukhaa, and the terraces of Shar Khad. These discoveries were in turn meticulously documented by D. Dorj and D. Tseveendorj, and represent a critical contribution to the understanding of early human settlement patterns and technological practices in the central region of Mongolia (Dorj and Tseveendorj 1978).

In 2018, D. Bazargur and G. Lkhundev, of the Institute of History and Archaeology at the Mongolian Academy of Sciences, conducted additional archaeological surveys in the upper reaches of the Tuul River, specifically near the area of Uvur gorkhiin Am. During the surveys, they identified lithic artifacts exposed along the riverbanks during road construction activities. Additionally, they conducted test excavations at Aguit Khad (also known as the Cave of Zuun Lam), a cave located in Uvur gorkhiin Am. These excavations confirmed the site as a stratified cultural layer, establishing its potential as an important Paleolithic archaeological site in the upper reaches of the Tuul River (Bazargur, Lkhundev, and Defleur 2019).

In the 2023-2024 period, under the direction of D.Bazargur, a research project[1] titled "Stone Age Sites in the Upper Reaches of the Tuul River" was launched. As part of this project, additional archaeological surveys were conducted in the upper reaches of the Tuul River, resulting in the discovery and documentation of over 20 new Paleolithic sites. These newly identified sites further enhanced the archaeological understanding of prehistoric human settlement and cultural practices in the region, contributing valuable data to the broader field of Paleolithic studies in Mongolia (Bazargur et al. 2024).

Archaeological surveys conducted in 2023 as part of this project led to the identification of sedimentary deposits containing lithic artifacts at the Uliin Tokhoi site, as well as lithic artifacts from 34 surface localities in the surrounding area. In 2024, test excavations were carried out at three distinct locations at Uliin Tokhoi. Here we present the results of these surveys and excavation, which were designed to accomplish the following objectives:

1) Examine whether Uliin Tokhoi contained stratified sediments that preserved archaeological layers, enabling a more accurate understanding of the site's temporal sequence.

2) Determine the chronology of the site by comparing the excavated lithic artifact assemblage with more securely dated Upper Paleolithic artifact assemblages discovered within and around Mongolia, thus setting the foundation for a broader understanding of the temporal framework of human occupation in Northeast Asia.

Site settings

The Tuul River bends around a mountain with high cliffs in Terelj, known as Uliin Bulan. About six kilometers downstream, a series of elevated terraces curve westward, gradually sloping down and reaching heights of 5–6 meters (Figure 1). Formed by fluvial processes and later compacted, these terraces are collectively referred to as Uliin Tokhoi. The formation of these terraces is primarily influenced by the river's erosional and depositional activities over time. These terraces are sheltered by a high mountain with rocks. The geology of the area consists primarily of granite, clay shale and sandstone (Naragerel 2007).

Methods

Excavation method

Three test excavations, each measuring 2 x 1 meters, were conducted to investigate the stratigraphy and artifact distribution at Uliin Tokhoi. The primary concentration of lithic artifacts was identified between approximately 0.8 m and 1.3 m below the surface, with no artifacts found beneath this stratigraphic layer. During excavation, all artifacts exceeding 2 cm in length were recorded in situ. The recovered sediments were subjected to dry sieving using a 4 mm mesh to facilitate the identification and analysis of smaller lithic materials. Graphic documentation included digital photographs, both hand-drawn and digital maps, and situational sketches to accurately capture the spatial distribution of the artifacts.

Survey method

Sampling survey and fieldwalking survey were our key methods. Fieldwalking is an effective and relatively cheap way of surveying land and has a vital place in the discovery of archaeological sites. These are visual surveys which seek to find traces of possible sites and are carried out, most usually, on foot. A surface survey can be systematic or unsystematic, although the most commonly used, is a systematic approach (Renfrew, Colin and Paul G. Bahn 2024). A

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Figure 1. Location of Uliin tokhoi site (photo courtesy of D.Bazargur).

grid is normally laid out on the ground to aid mapping and a team of walkers go over each area on the grid, recording sites and finds. The overall record of the types and scatter of the artefacts found can give a good idea of the age of a site and its possible previous uses. Locations of the discovered Paleolithic sites were recorded by using Global Positioning Systems (GPS) while the cores, artifacts of tools type as well as blanks were collected as samples.

Results

Excavation

A total of 100 artifacts were recovered from the excavation of three pits at Uliin Tokhoi, and 120 artifacts were collected through survey exploration (Table 1). It should be noted that the majority of the excavated and collected artifacts consist of flake production, while cores and tool types are relatively scarce.

Table 1. Typological List of the Lithic Assemblage from the Excavation at Uliin Tokhoi site.

№		*Pit 1*	*Pit 2*	*Pit 3*	*Total*
	Core typology				
1	Single platform, multiple flaking surface core	-	1	-	**1**
	Tool typology				
1	Point	-	2	1	**3**
2	Notched tool	-	1	1	**2**
3	Borer	1	-	-	**1**
4	Retouched flake and blade	-	3	2	**5**
	Blank production				
1	Blade	-	12	4	**16**
2	Flake	7	38	2	**47**
3	Debitage	-	4	-	**4**
4	Fragment	4	17	-	**21**
	Total	**12**	**78**	**10**	**100**

Pit 1 is located on a high terrace. The stratigraphy consists of two primary layers: the upper layer, Layer 1, is 30 cm thick and is characterized by a brownish-yellow soil composition. Layer 2 is 50 cm thick, and consists of a greyish calcareous matrix intermixed with sand and clay, and contains the evidence of fragmented small stones. The distinct stratigraphic differentiation led to the designation of the lower portion of the second layer as Layer 2a (Figure 2). The excavation yielded a limited number of artifacts (Tables 1).

Layer 1: A total of 5 artifacts were found, including 1 borer (Figure 3. *1*) and 4 flakes. Layer 2: A total of 7 artifacts were found, including 3 flakes (Figure 3. *2*, *3*) and 4 fragments.

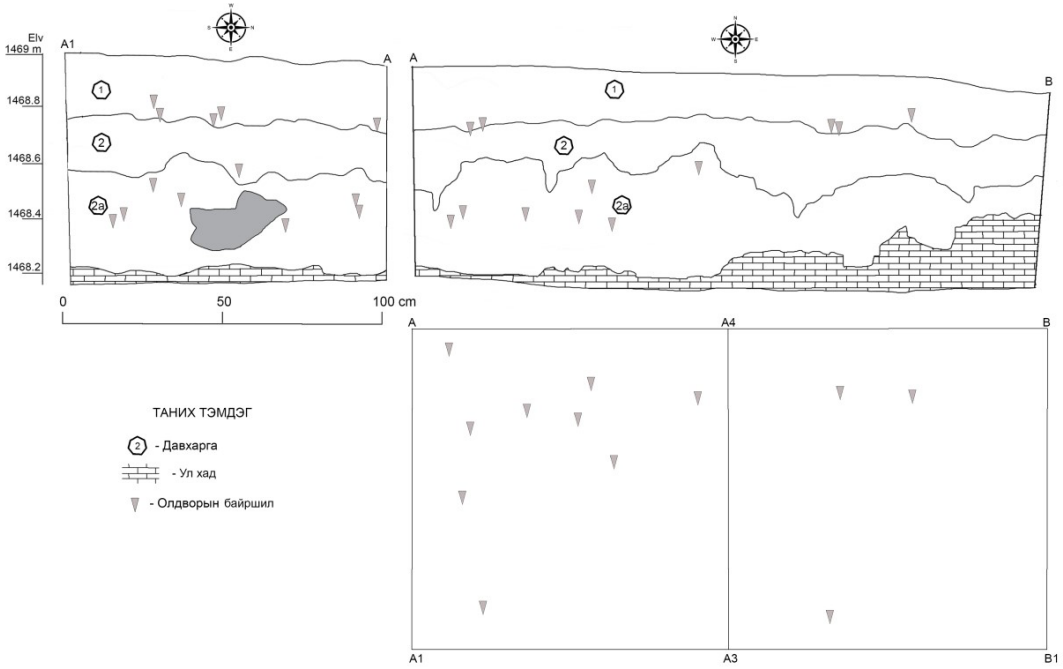

Figure 2. Stratigraphic Pit 1 and Patterns of distribution of finds.

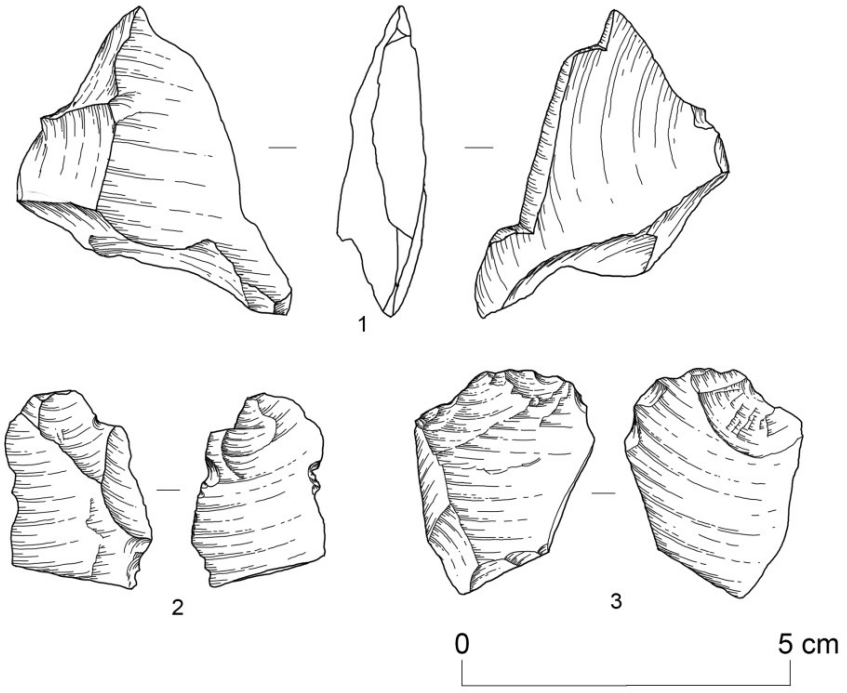

Figure 3. Borer-1; flake-2, 3.

Pit 2 is located 300 meters southwest of Pit 1. The first layer is 25-30 cm thick with brownish-yellow soil. The second layer, 30-35 cm thick, consists of gray, calcareous, sandy, and clayey soil. The third layer is 30 cm thick and contains a high concentration of fragmented stones. The bottom of the stratigraphy directly rests on bedrock, the upper surface of which stone artifacts were recovered (Figure 4). Compared to Excavation Pit 1, Pit 2 yielded a higher density of artifacts.

Layer 1 yielded 15 lithic artifacts. Among them, there is one core, which has a single striking platform and multiple flake surfaces. The slightly inclined striking platform shows multiple detachments in preparation. It has a pointed base, and the opposite surface of the flaking surface was modified using oblique removals (Figure 5. *1*). Traces of short, parallel flake removals can be observed around the striking platform. The remaining artifacts belong to flake production, including 6 flakes and 8 fragments.

Layer 2 yielded 23 lithic artifacts, all associated with blank production. These include 14 flakes, 5 blades and blade fragments (Figure 5. *6-8*), 1 spall, and 3 fragments.

Layer 3 yielded 40 lithic artifacts. The tool assemblage includes 2 points, 1 notched tool, and 3 retouched flakes. A total of 34 artifacts belong to spalls production, categorized as 18 flakes, 7 laminar flakes, 3 spalls, and 6 fragments.

Point (2). The first point exhibits a triangular flake removal scar on the dorsal side, with no discernible striking platform (Figure 5. *2*). The second point was produced through a secondary flake removal from a Levalloisian core. Its striking platform is semi-curved in shape (Figure 5. *3*).

Notched tool (1). Tool is a fragment from the middle section of a laminar flake, with one longitudinal edge retouched into a concave shape through notch removals. Extensive use is evident from the significant edge wear observed along its working edge. Additionally, an attempt was made to retouch the opposite longitudinal edge using similar notch removals (Figure 5. *4*).

Retouched flake (3). Medium size, with one convex edge modified through marginal retouch.

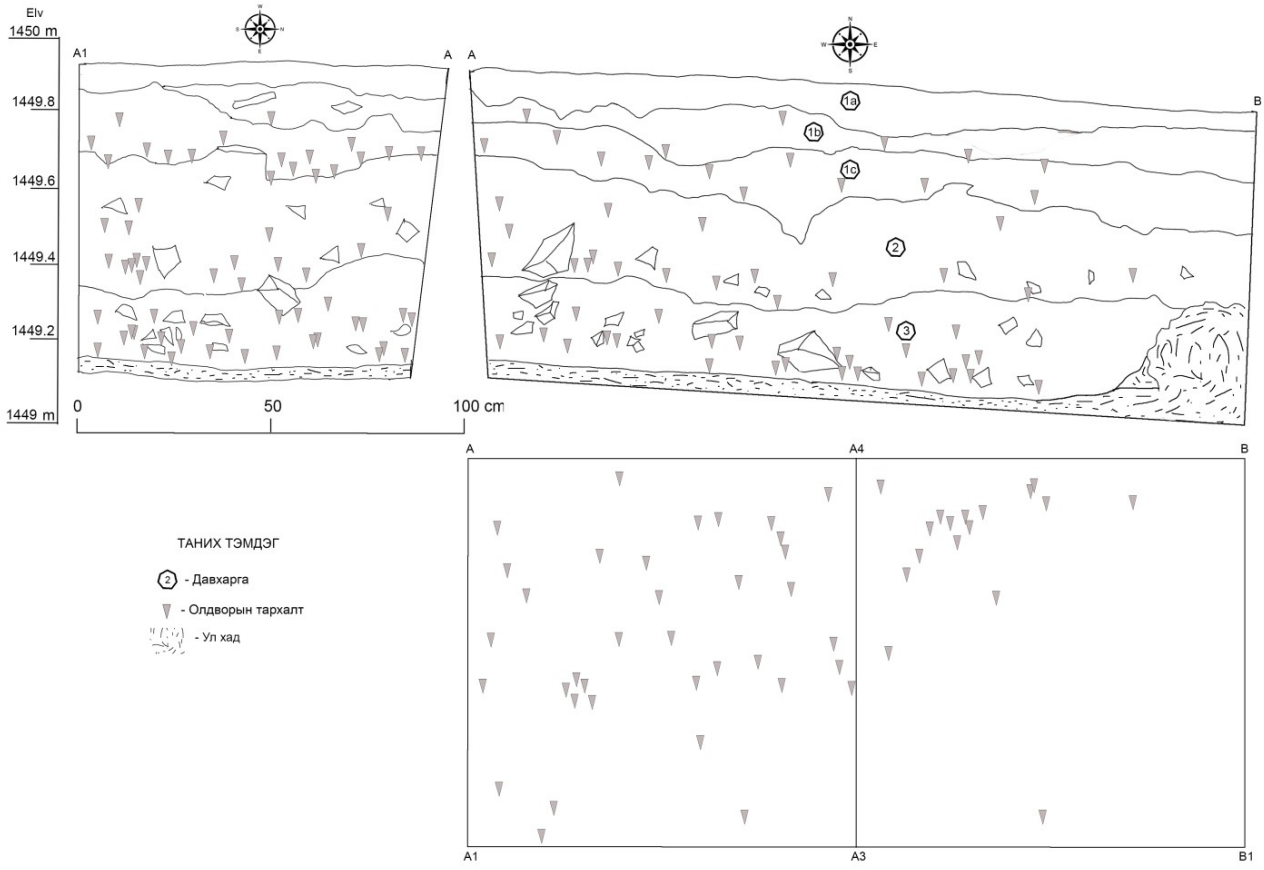

Figure 4. Stratigraphic Pit 2 and Patterns of distribution of finds.

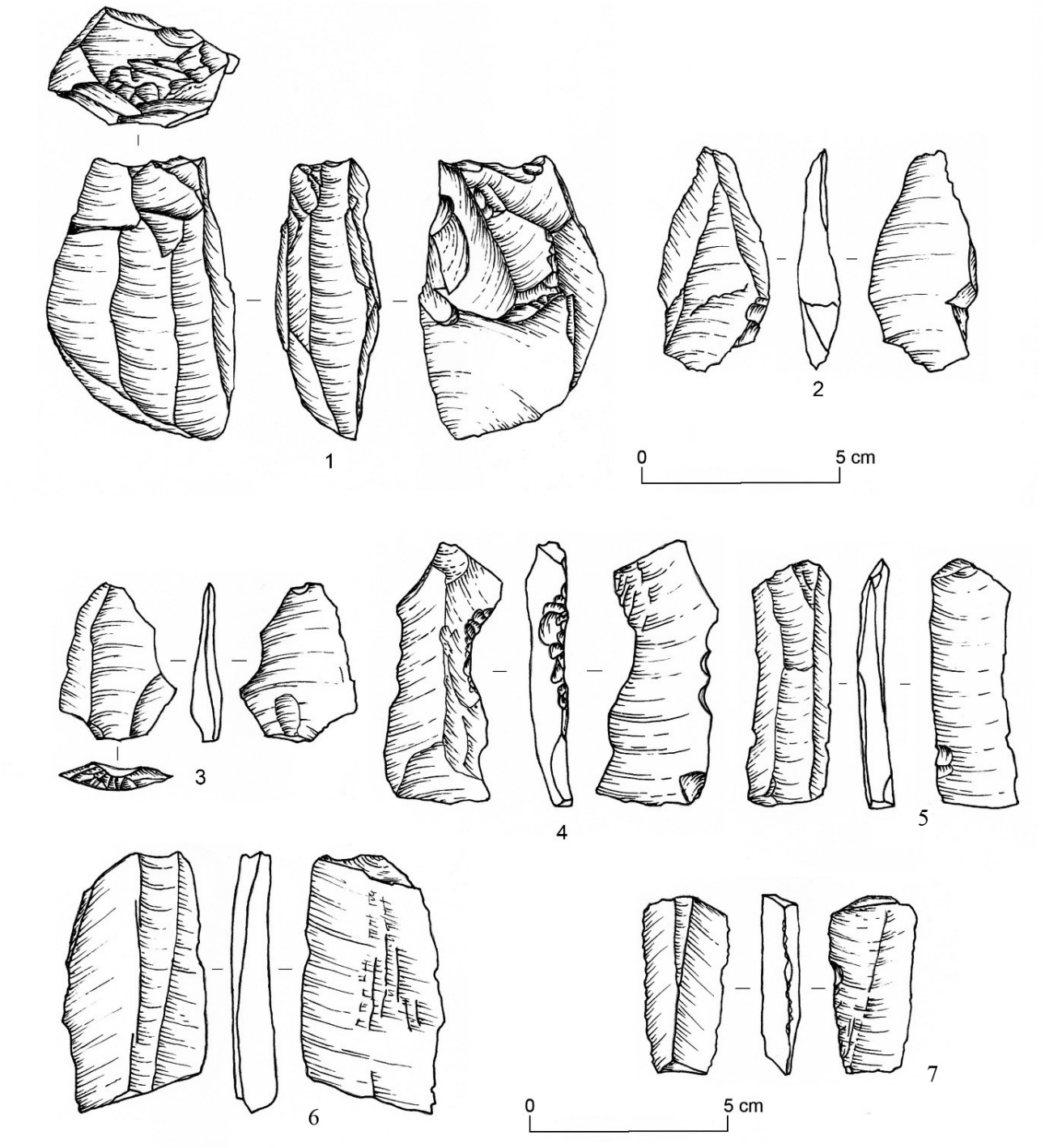

Figure 5. Blade core-1; point-2, 3; notched tool-4; blade-5-7.

Pit 3 is located between **Pit 1** and **Pit 2.** The first layer is 25-30 cm thick, consisting of dark brown soil. The second layer, 25-35 cm thick, composed of grayish calcareous clay with a sandy texture in its lower part. The third layer, 50 cm thick, consisting of yellowish sandy clay with numerous large and small fragmented stones. The fourth layer, 20 cm thick, characterized by sandy soil with a high concentration of small fragmented stones (Figure 6).

Artifacts were recovered only from the first two layers during the excavation.

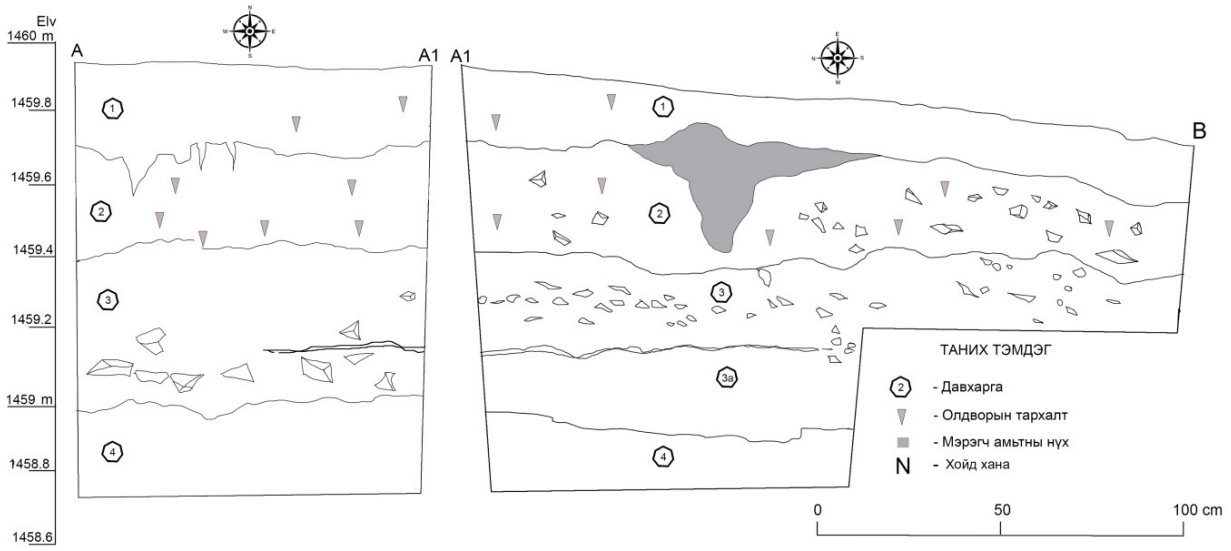

Figure 6. Stratigraphic Pit 2 and Patterns of distribution of finds.

Two artifacts were recovered from Layer 1, both of which are fragments of blade fragments (Figure 7. *3*).

A total of 8 artifacts were recovered from Layer 2. The tool assemblage includes 1 point, 1 notch tool, and 2 retouched blades. Additionally, the spalls production assemblage consists of 2 flakes and 2 blade fragments.

Point (1). Elongated, triangular-shaped laminar flake. One edge is obliquely shaped toward the tip, while the opposite convex edge has been retouched using notch removals (Figure 7. *1*).

Notched tool (1). Tool is a triangular flake with three concavities along one oblique edge. One of these concavities has been finely retouched (Figure 7. *2*).

Retouched blade (1). Long, laminar flake that is thicker near the striking platform and gradually thins toward the tip. One longitudinal edge has been retouched, and a single notch removal is present at the tip (Figure 7. *4*).

Retouched blade fragment (1). A fragment of a blade with a retouched working edge along one longitudinal side.

Surface Collection

A total of 120 artifacts were systematically collected from 34 locations across multiple terraces in the Uliin Tokhoi area (Table 2).

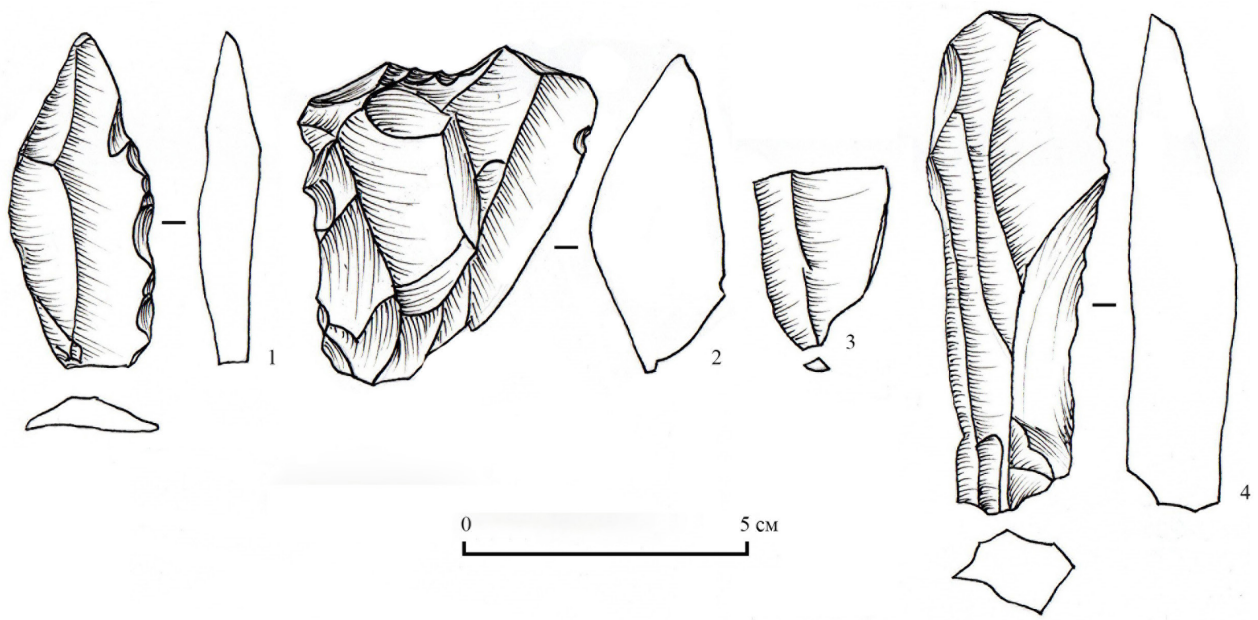

Figure 7. Point-1; notched tool-2; blade fragment-3; retouched blade-4.

Table 2. Typological List of Lithic Artifacts collected from the Surface of the Uliin Tokhoi site.

№		Total
	Core typology	
1	Preform	4
2	Single platform, single flaking surface elongated core	1
3	Single platform, single flaking surface core	4
4	Single platform, multiple flaking surface core	1
5	Double platform, single flaking surface elongated core	1
6	Double platform, single flaking surface core	1
7	Struck flake	1
8	Fragment with flake removal scars	2
Tools type		
1	Levallois point	4
2	Point	5
3	Scraper	8
4	Side scraper	2
5	Notched tool	7
6	Knife	2
7	Hand axe	1
8	Borer	2
9	Spurred tool	1
11	Spur-like	2
12	Combination tool	3
13	Chopper	1
14	Truncated tool	2
15	Retouched blade	4
16	Retouched flake	4
17	Retouched spall	9
Blank production		
1	Blade	8
2	Crested blade	9
3	Cortical blade	6
4	Flake	8
5	Laminar flake	17
Total		**120**

Primary flaking is represented by cores and preforms (Table 2). A total of 4 preforms were identified. Three of them have a single striking platform and a single flake removal surface, characteristic of core reduction. The other core is a Gobi-type (like wedge-shaped core).

Two elongated cores were identified, each with a single flake removal surface and either one or two striking platforms. The core with a single striking platform has a prepared inclined platform, from which two long blades and one short blade were detached (Figure 9. *2*). The core with two striking platforms exhibits an inclined platform on one side and a flat platform on the other. Blades were detached using an opposing flaking technique.

Four cores with a single striking platform and one blade removal surface were identified. The striking platforms of these cores were prepared with a backward inclination. The bases of two cores show evidence of modification. The blade removal surfaces exhibit parallel blade scars, indicating the detachment of short blades (Figure 8. *1*; Figure 9. *3*).

One core with a single striking platform and multiple flake removal surfaces, 1 core with two striking platforms and a single flake removal surface, one struck flake, two fragments with visible flake removal scars.

The tool assemblage consists of more than 10 types of tools (Table 2). There are four Levallois-type points (Figure 8. *3*, *4*), three of which are broken. Additionally, there are 5 points (Figure 8. *5*), 2 of which are broken, and 3 have retouched edges. The most common tool type is the scraper (8 pieces), which can be divided into end scrapers and corner scrapers. Three of the end scrapers were made from laminar flakes, and two were made from flakes. The ends were retouched with a vertical edge. Two of the corner scrapers were made from laminar flakes, and one from a flake. The corner edges were slightly retouched. There are two side scrapers (Figure 9. *1*,

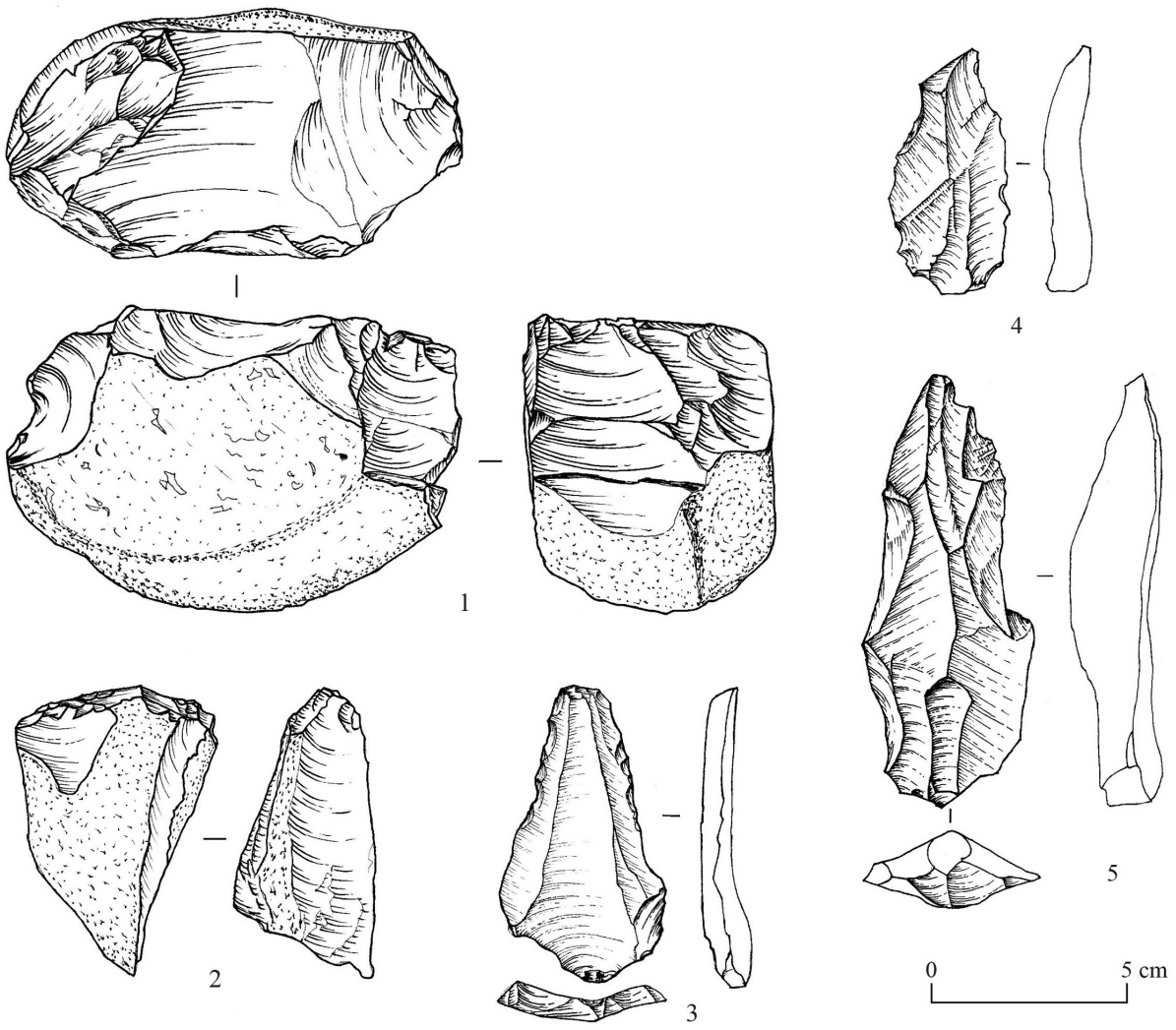

Figure 8. Single platform, single flaking surface core-1; side scraper-2, Levallois point-3, 4; point-5.

4), both made from flakes. The convex edges have been retouched. Two knife-type tools made from long flakes have one of the convex edges retouched. One interesting tool in the assemblage is a hand axe-like tool, made from a long rectangular primary flake. Both edges of the primary flake were sharpened by transverse retouching on the dorsal side. One end has a wide edge that was shaped through semi-vertical flaking, and both sides were further retouched to form a hand axe-like shape. Spalls production consists of primary flakes, blades, laminar flakes, and technical spalls (Table 2).

Discussion

Among the cores representing primary flaking, there is an elongated core with a single flake removal surface and one or two striking platforms. Flakes were detached from the core in one direction as well as in an opposing direction. A similar type of elongated cores, both in terms of flaking method and shape, has been found at the Tolbor-4 Paleolithic site (Layer 6) and at the Tolbor-16 Paleolithic site (Layer 7) in the Northern Mongolia. This type of core is primarily used for detaching long laminar flakes. Layer 6 of the Tolbor-4 Paleolithic site has been radiocarbon dated to 37,400±2,600 BP (AA-79314) (Derevainko et al. 2013), while Layer 6 of the Tolbor-16 Paleolithic site is dated to 42.5-45.6 ka cal BP by radiocarbon (Zwyns et al. 2019).

Cores with a single striking platform and a single flake removal surface, a single striking platform and multiple flake removal surfaces, and two striking platforms with a single flake removal surface exhibit flake removal scar indicating the detachment of short, parallel flakes. The striking platforms of these cores were prepared with a backward-sloping angle. Similar cores, in terms of morphology and flaking technique, are abundant in Layers 4 and 5 of the Tolbor-4 site

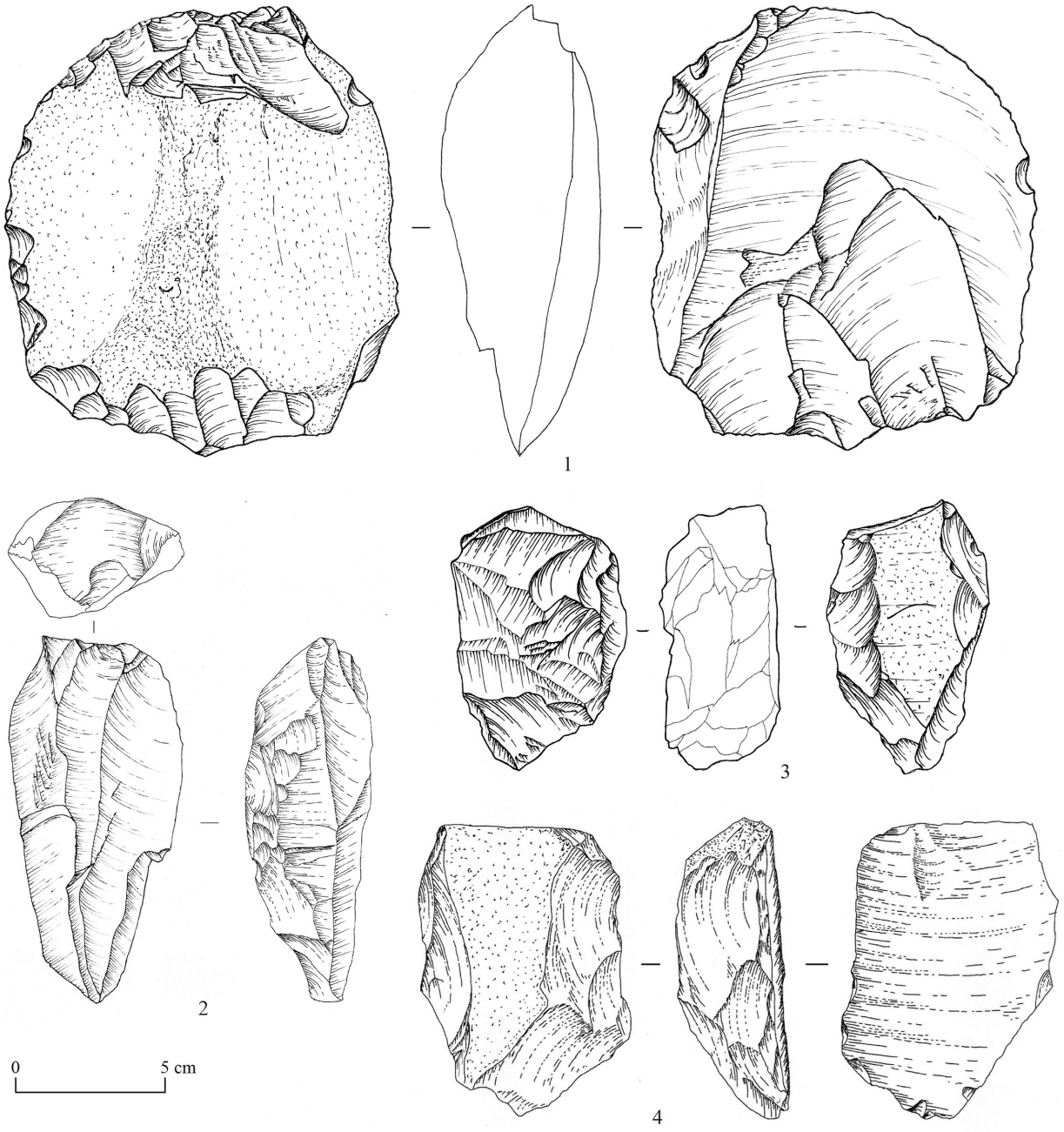

Figure 9. Side scraper-1, 4; single platform, single flaking surface elongated core-2; single platform, single flaking surface core-3.

(Derevainko et al. 2013) and Layers 5-7 of the Tolbor-15 site (Gladyshev et al. 2012). Layer 4 of the Tolbor-4 Paleolithic site is dated to 26,700±700 BP (AA-84135), while Layer 5 is dated to 31,210±410 BP (AA-93140). Layer 5 of the Tolbor-15 Paleolithic site has radiocarbon dates of 32,200±1,400 BP (Beta-263745). Similar cores have also been found in Layers 1-3 of Chikhen Cave (Derevainko et al. 2015) and at Tsatsyn Ereg-2 (Simonet et al. 2013), among other sites. These assemblages are generally attributed to the Early Upper Paleolithic period**.**

Among the Levallois-type points, three are fragmented. Similar Levallois points have been identified at several sites in Mongolia, including Moiltiin Am and Khargana-5 (Rybin et al. 2015). The points made from flakes exhibit retouched edges on one side and are of medium size. Comparable points have been found at the nearby Bayantsagaan Uul Paleolithic site (Bazargur et al. 2024), as well as at the Tolbor-15 Paleolithic site (Derevianko et al. 2013), Tsatsyn Ereg-2 (Simonet et al. 2013), and the Kamenka site near Lake Baikal, Russia, where they

occur in significant numbers (Zwyns and Lbova 2019). Scrapers are the most numerous tool type, with 3 end scrapers made from elongated blades. Similar end scrapers have been identified at the Ikh Tolbor River valley (Derevianko et al. 2013) and the Ulaan Khanan Paleolithic site (Bolorbat, Bazargur, and Lkhundev 2024). Two knives were produced by retouching the convex edge of long blades. Comparable knives have been found at the Tsagaan Turuut River Paleolithic site in Galuut soum, Bayankhongor aimag (Bolorbat et al. 2023).

Conclusion

In the headwater of the Tuul River, in the central region of Mongolia, three test excavations were conducted at the site of Uliin Tokhoi, along with a surface collection from 34 locations, resulting in a total of 220 artifacts. A comparison of the primary reduction cores found among the artifacts with those from Upper Paleolithic sites in Mongolia and neighboring regions suggests that they may be associated with the Initial and Early Upper Paleolithic period. Additionally, the presence of several Levalloisian-derived points suggests an affiliation with the early Upper Paleolithic. The lithic assemblage includes characteristic Upper Paleolithic tools such as points, scrapers, notched tools, knives, and borers. Furthermore, the dominance of blade production in the assemblage further supports this conclusion.

Continued research at the Uliin Tokhoi Paleolithic site has the potential to yield additional material that could establish a more precise chronological framework.

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