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ARTICLE

Newly discovered Upper Paleolithic sites from the Tsagaan Turuut river valley, Mongolia

Tsedendorj Bolorbat[1]*, Cao Jian En[2,3], Song Guo Dong[3], Batsuuri Ankhbayar[4]
Guunii Lkhundev[1], Tsend Amgalantugs[1], Gonchig Batbold[1], Cao Peng[3] and Cai Xi[3]

[1]Institute of Archaeology, Mongolian Academy of Sciences
Ulaanbaatar, Mongolia
[2]Inner Mongolia Normal University, PR China
[3]Institute of Cultural Relics and Archaeology Inner Mongolia, PR China
[4]Inner Mongolia University, PR China

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Abstract: *In this article, we report artefacts found at the valley of Tsagaan Turuut River in the Khangai Mountain ranges in Central Mongolia. The artefacts were identified based upon core morphology, tool types and retouch. Regarding the core reduction techniques, single striking platform and single reduction platform cores are dominant. Although the tools on flake blanks predominant, tools such as points and knives with massive blades also occur. Side scraper, point, borer, combination tool, and borers are types that are less represented within the collection. This tool collection is highly similar to several IUP and EUP sites (Chikhen-2; Tolbor-4, 15 and 16) in Mongolia in terms of its reduction techniques and tool morphology. On a larger scale, it is similar to those of Early Upper Paleolithic sites in Trans-Baikal and Altai Mountains in Russia and North China.*

Keywords: *Mongolia; Tsagaan Turuut River; Upper Paleolithic; lithic technology;*

INTRODUCTION

The territory of Mongolia lies in an extreme geographic region of Asia, located between the northern part of China and the Siberian Plateau of Russia. The central part of Mongolia belongs to the dry climatic region of the Gobi where there is almost no stratified sites, although numerous Paleolithic and Neolithic materials have been identified from surface collections. As it is challenging to determine the actual age of the artefacts recovered in this region due to the rate of erosion, it is common to estimate the age of surface collections by comparing them with well-dated reference site-specific recombination.

***corresponding author: bolorbatts@mas.ac.mn** **https://orcid.org/0000-0003-0176-7644**

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Mongolia has been in the focus of Paleolithic studies for more than a century. The first full-scale investigation of Pleistocene sites in the region were carried out after H. F. Osborn and W. D. Matthew's hypothesis promoting Central Asia as the heart of human origin, which was put forth during the early 20th century [1, 2]. In order to test this hypothesis, the American Museum of Natural History organized a series of multidisciplinary expeditions in Mongolia and in North China. The Central Asiatic Expeditions, led by Roy Chapman Andrews, carried out investigations in Mongolia during five field seasons in 1922, 1923 and 1925 [3].

In 1979, a joint Mongolian-Soviet Historical and Cultural expedition (headed by A. P. Okladnikov, and D. Tseveendorj) discovered numerous lithic artefact sites in the valley of Baidrag River located in Bayankhongor aimag (province) [4].

In 1985, another joint Mongolian-Soviet Historical and Cultural expedition (headed by D. Dorj, and V. T. Petrin) focused on Bayankhongor aimag, which resulted in the discovery of numerous Paleolithic sites and the collection of thousands of tools. Within the discovery, large sites were found in the valley of Tuin river [5]. Additionally, caves and rock shelters, including the Tsagaan Agui and Chikhen Agui caves in Bayankhongor aimag, were found at the foothills of the Gobi Altai Mountains.

A fundamentally new phase in the history of Mongolian archaeology began in 1995 with the formation of the trilateral Joint Mongolian-Russian-American Archaeological Expedition. This joint expedition (led by D. Tseveendorj A. P. Derevainko, and J. Olsen) carried out excavations between 1995 and 2000. Radiocarbon dating of bone samples collected in the fourth layer of Tsagaan Agui provided an age estimate of 33,843 ± 642 BP (AA-23158) [6]. A single radiocarbon date of 30,550 ± 410 BP (AA-31870) was obtained from Layer 2.5 of Chikhen Agui [7].

In 2018, a joint Mongolian and Chinese expedition (headed by Ts. Bolorbat, and J. E. Cao) carried out archaeological survey along the middle stream of Tsagaan Turuut river in Galuut soum, Bayankhongor aimag. The outcome of the expedition was the discovery of additional Paleolithic collections that could shed new light on the early inhabitants in the region (Fig. 1). The expedition resulted in the discovery of 723 tombs, including a square tomb and keregsuur (funerary structures in the form of soil-stone embankments with a height of one to two to three meters) appertaining to the Bronze Age, as well as a burial site, which dated back to the periods of the Xiongnu and the Turkic empires, and also four new sites that suggest they belong to the Paleolithic Period, as described below.

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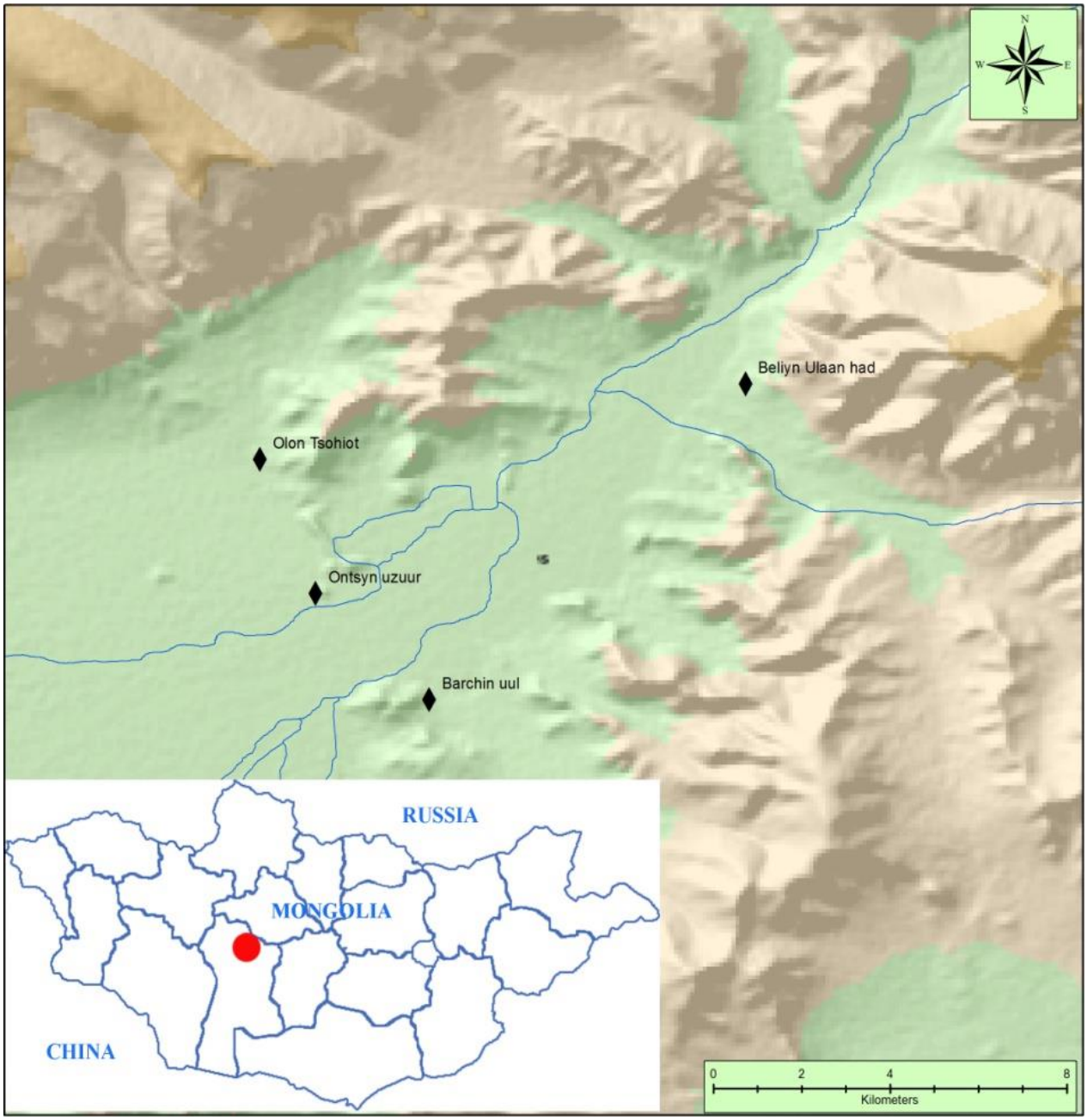

Figure 1. Location of sites mentioned in the text

MATERIALS AND METHODS

Geographical setting. The Tsagaan Turuut River (3900 km^2) originates in the Anag Mountains of the Khangai Mountain ranges (3500 m asl). It flows through Galuut soum of Bayankhongor aimag, and joins Ulziit River and Lake Olgoi.

Galuut soum is located in the northern part of Bayankhongor aimag and the southern and central parts of the Khangai Mountains, a region characterized by mountainous highlands, steppes, and river valleys, including alluvial and proluvial sediments [8]. Quaternary deposit soils have formed three terraces covered by 6-8 meter thick alluvium that extends to 15 meters from the river. The alluvial sediments are predominantly composed of gravels, though sandy and riprap beddings also occur in the deposit. Surveys of the region have revealed that quartz, chert and granites are quite common in the region, and their size increases as one moves downstream from the slopes through the river valley [9].

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Survey methods. Sampling survey and fieldwalking survey were the key methods used in this study. Fieldwalking is a cost-effective way of surveying land and plays a crucial role in the discovery of archaeological sites. These are visual surveys which seek to find traces of possible sites and are carried out, most commonly, on foot. A surface survey can be either systematic or unsystematic, although the most common approach in archaeological survey is a systematic one [10]. Regardless of the approach, the purpose of a survey is to identify potential archaeological material within an area reflecting past human activity [11]. In a systematic survey, a grid is normally laid out on the ground to aid mapping, and a team of walkers carefully go over each area on the grid, recording sites and finds. The overall distribution and type of artefacts found can give a good idea of the age occupation of a region and its past use by human groups [12]. Locations of the discovered Paleolithic sites were recorded by using Global Positioning Systems (GPS) while the cores, retouched tools and blanks were collected as samples.

We collected the Paleolithic artefacts within a perimeter (minimum 30 x 70m, maximum 60 x 100m) delimited around an area yielding surface finds.

RESULTS AND DISCUSSION

We collected a total of 135 numerous Paleolithic artefacts from four locations in the valley of the Tsagaan Turuut River. Blanks are the most numerous and represent 66,0% of the assemblage, followed by tools with 24,4% and cores, with 9,6%, (Table. 1).

Table 1. Principal categories of lithic artefacts from Tsagaan Turuut River

Category	Barchin Uul		Olon Tsokhiot		Ontsyn Uzuur		Beliin Ulaan Khad		Total	
	Num-ber	%	Num-ber	%	Num-ber	%	Num-ber	%	Num-ber	%
Cores	2	11,8	1	3,7	6	20,0	4	6,6	13	9,6
Blanks	10	58,8	18	66,7	18	60,0	43	70,5	89	66,0
Tools	5	29,4	8	29,6	6	20,0	14	22,9	33	24,4
Total	**17**	**100**	**27**	**100**	**30**	**100**	**61**	**100**	**135**	**100**

Barchin uul. At Barchin Uul, 17 artefacts were collected within an area of 50 x 70 m.

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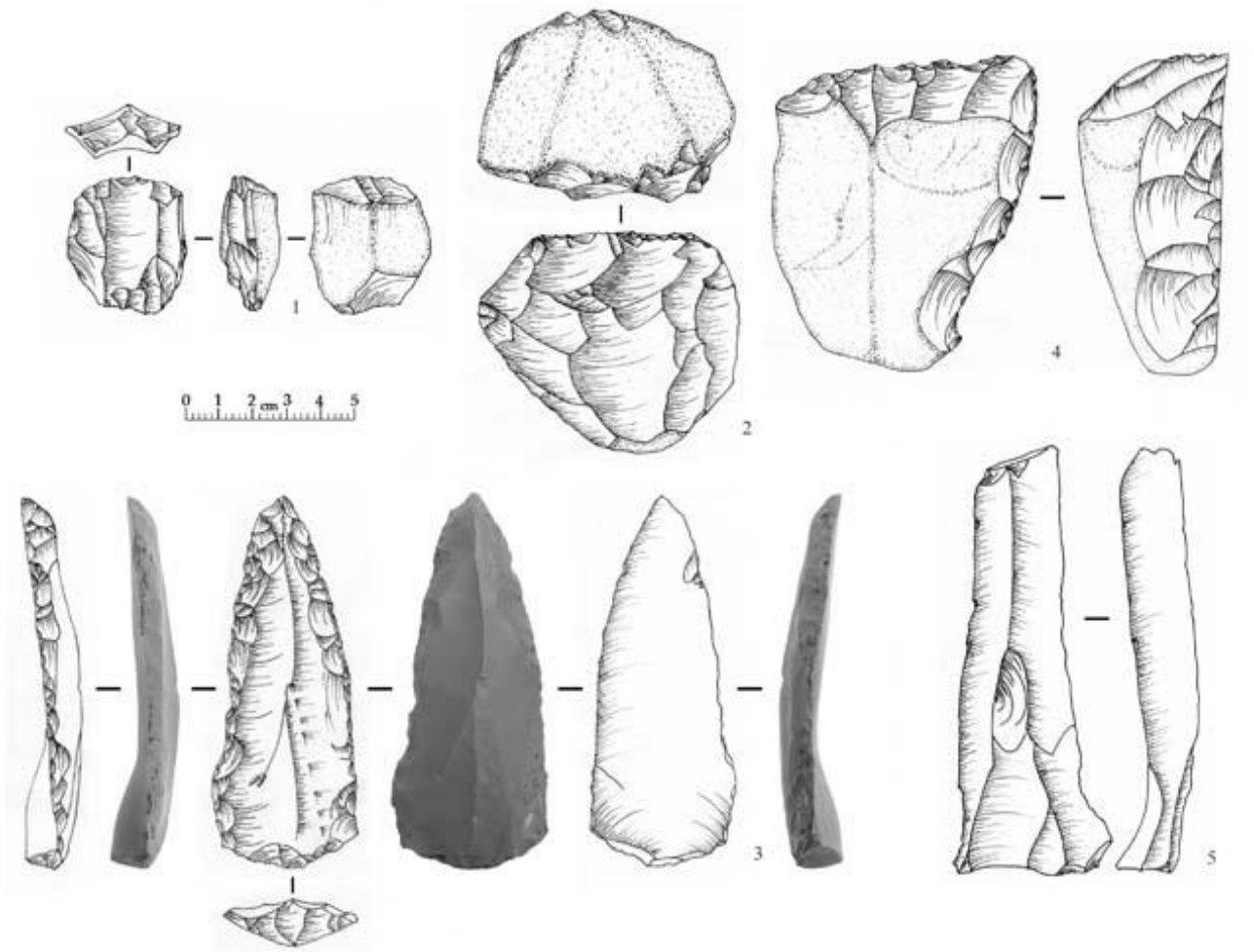

Figure 2. Barchin uul. 1. Levallois-like core; 2. Single-platform, mono-frontal core; 3. Point; 4. Convergent sidescraper; 5. Large blade

Two cores were collected and one of them, although small in size, is identified as a Levallois core (Fig. 2.1). A Levallois core, similar in size and typed as Levallois cores, were found in stratum 2.6-2.8 at Chikhen-2. Primary reduction is illustrated by small Levallois-like single platform, triangular cores. Single- and double-platform cores with parallel scars on their flaking surfaces are also known. A radiocarbon date of 30,550±410 uncal BP (AA-31870) on a wood charcoal sample assign this material to the Upper Paleolithic Period [13]. Another core has single striking surface and mono-frontal surface (Fig. 2.2). A flat surface on the artefact was used as a striking platform whereas another side exhibited the negatives of small blades. The tools component of the collection consists of five artefacts. A point was made on a large blade. Bilateral, semi-abrupt retouch (Fig. 2.3). The wider area of a transverse, convergent side scraper (Fig. 2.4). The remaining artefacts are denticulate or combine different tool types onto one blank. In addition a fragment of pestle was found. Blanks from the collection consists of a blade, a blade spall, and eight flakes. A large blade was recovered with a length of 12.5 cm despite the fact that does it not preserve the presence of a platform (Fig. 2.5). Similarly, large blades have been discovered from archaeological lower layers dated as Tolbor-16, AH4-AH6 [14].

Olon Tsokhiot. The identification of Olon Tshokhiot resulted in the collection of 27 artefacts within an area 50 x 90 m.

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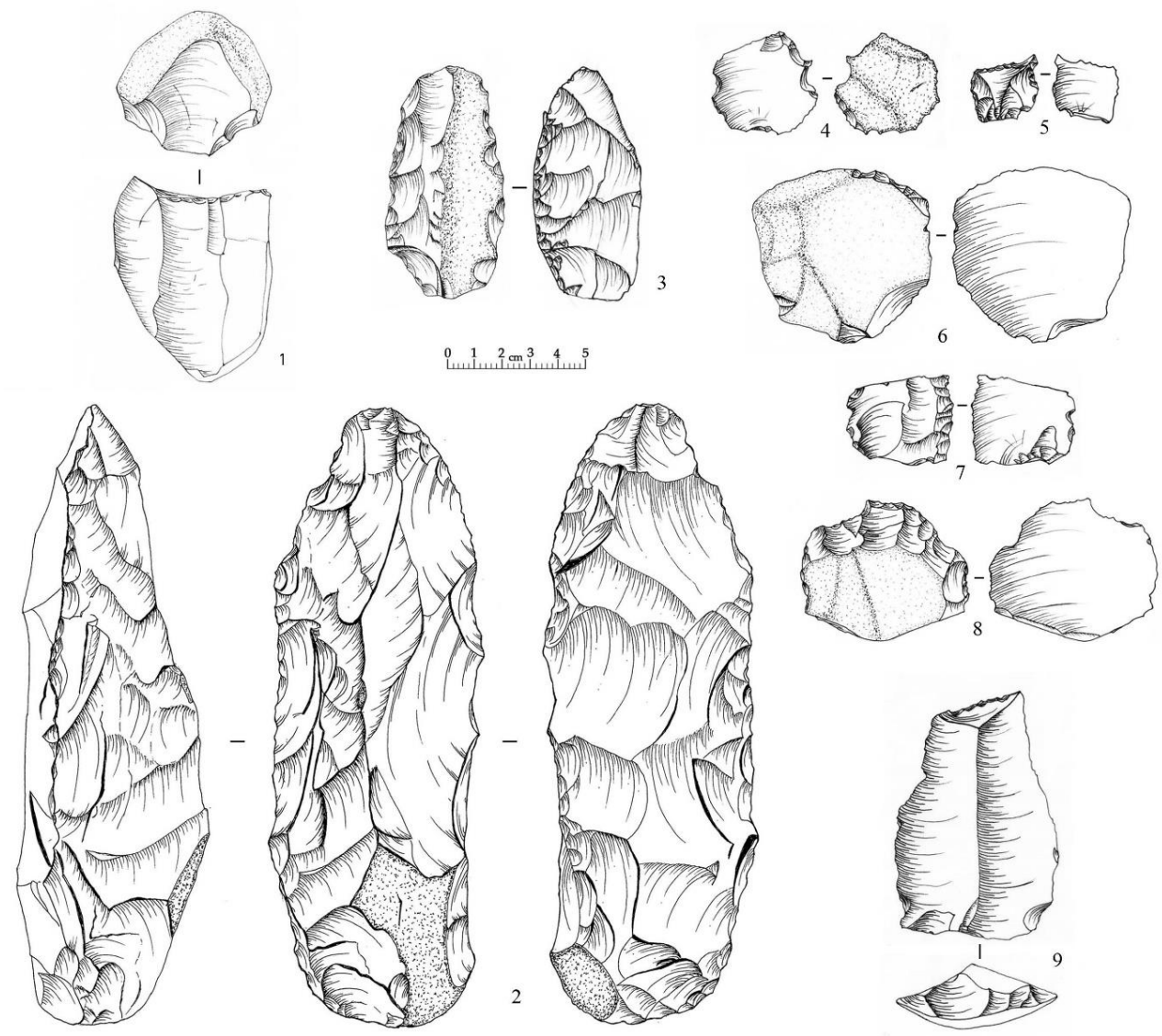

Figure 3. Olon Tsokhiot. 1. Single-platform, mono-frontal core, 2. Hand axe, 3. Side scraper, 4, 5. Borer, 6. Angular scraper, 7. Retouched flake, 8. End retouched tool

The artifacts include a core characterized by a single striking surface and single flaking surface (Fig. 3.1). This unidirectional prismatic core has a plain striking platform and except for the flaking surface, other areas retains surface cortex. The tools collected consist of a hand axe preform (Fig. 3.2), an angular scraper (Fig. 3.6), 2 borers (Fig. 3. 4, 5), a side scraper (Fig. 3.3), a burin (Fig. 3.7), a retouched flake (Fig. 3.8), and an end retouched tool (Fig. 3.9). The hand axe is big in size (22,7 x 7,7 x 7 cm) and plano-convex in section. Blank production consists of 2 blades and 16 flakes while one flake is relatively large and triangular.

Ontsyn Uzuur. At Ontsyn Uzuur, 30 artefacts were collected from an area of 30 x 70 m, six of which are identified as cores.

With a surface exhibiting a single massive removal opposed to a surface cortical surface with centripetal removals, one of the cores could illustrate the early stages of reduction by a Levallois preferential method. (Fig. 4.3).

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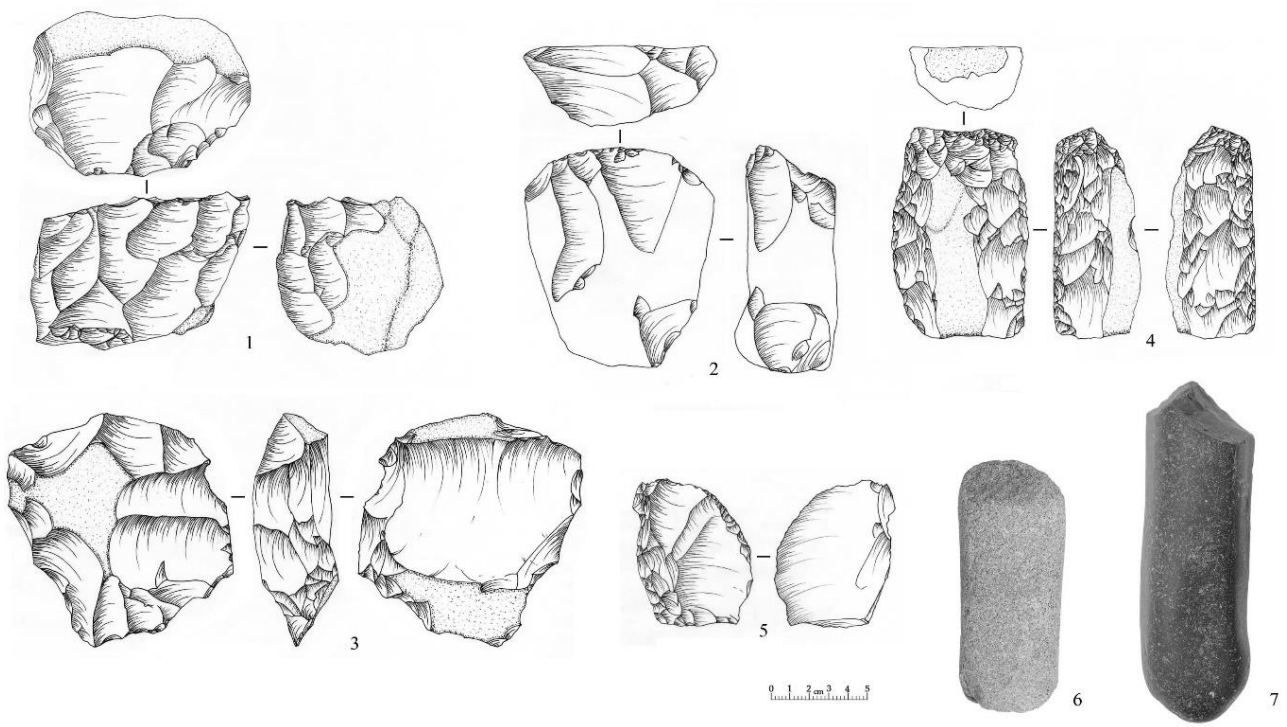

Figure 4. Ontsyn Uzuur. 1, 2. Single-platform, mono-frontal core; 3. Discoid core; 4. Push-plane; 5. Sides craper; 6, 7. Pestle

Another core is considered as being a typical Levallois flake core though the flake scars are heavily weathered. One of them has a strongly oblique angle between the striking platform and the flaking surface; the latter bearing the negatives of two blade removals (Fig. 4.1), while another is a preform that illustrates the early stages of reduction of a flat-faced core (Fig. 4.2). The tools collection consists of side-scraper (Fig. 4.5), scraper, 2 push-plane tools (Fig. 4.4), and 2 pestles. One of two pestles has been identified as flint (Fig. 4.6) while the other one is made of granite (Fig. 4.7). The blank collection from the survey of Ontsyn Uzuur consists of 18 small flakes.

Beliin Ulaan Khad. Includes 61 lithic artefacts recovered over an area of 60 x 100 m and from a test excavation conducted in a 2 x 1 m trench at a depth of 50 centimeters. Three geological layers have been identified from the test excavation; however, there were no lithic artefacts in the excavated area (Fig. 5).

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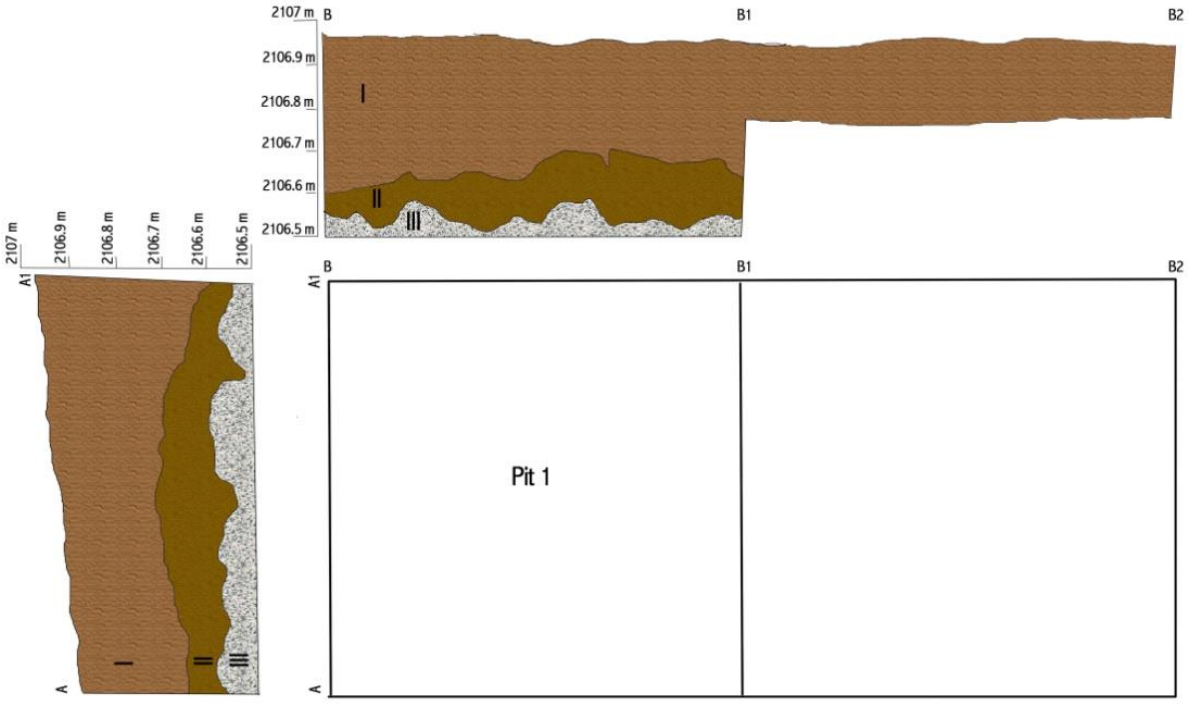

Figure 5. Beliin Ulaan Khad. Stratigraphic profiles

The surface collection includes four cores, two of which are single platform cores. The striking platform of the first core shows little preparation and leaving cortex intact (Fig. 6.1). This core has a single striking platform and multiple unidirectional negatives. Similar cores, dating to the Upper Paleolithic Period, have been found at Baidrag-11 and Argalant-3 sites [15]. The tools consist of a point, an end-scraper, 2 side-scrapers (Fig. 6.3, 4), 2 knives (Fig. 6.5), a combination tool (Fig. 6.6), retouched blanks, a backed tool, and 2 fragments of retouched blanks. The retouched point was made on a large blade. The edges are modified by semi-abrupt bilateral retouch (Fig. 6.2). Flake production consists of several large flakes, 2 fragments of blades, 6 blade spalls, and 35 other flakes.

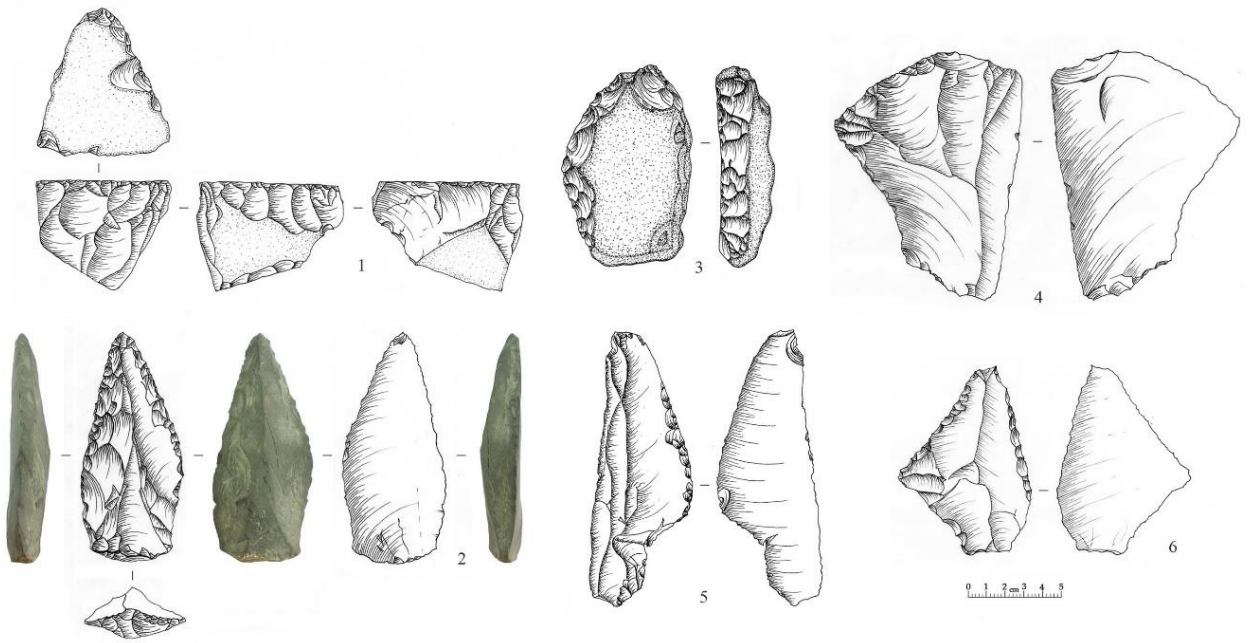

Figure 6. Beliin Ulaan Khad. 1. Single-platform, mono-frontal core; 2. Point; 3, 4. Side scraper; 5. Knife; 6. Combination tool

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The following features were observed during the preliminary analysis of the stone artefacts from these 4 sites:

1) All stone tools were made on raw materials that can be collected in the river valley.

2) There is some degree of consistency in the flaking method and techniques with a predominance of single-platform cores, parallel flaking and plain platforms. There are, however, artefacts that are reminiscent of the Levallois method.

3) Flaking directed primarily at producing blades and sometimes bladelets. However, the majority of tool blanks collected are flakes.

The tool kit is composed of 10 types that can be grouped into two basic types - formal and informal, based on morphological differences. The "Informal" category includes tools that have no particular purpose such as for general cutting, piercing and account for 26.3% (n=5) of the tool collection. In the "formal" category there are tools interpreted as having had specific purposes, and make up for 73,7% (n=14) of the collection. The tools made out of flakes are seen to be dominant, however, points and knives made from blades are also largely evident. Notably, tool types from the Upper Paleolithic Period, such as point, scraper, borer, multifunctional tools, and awl are found in the collection. According to the retouch pattern, the point, plane tool, and scraper have semi-abrupt and stepped retouch, while the remainder tools have predominantly faceted retouch.

CONCLUSIONS

Based on the features described above, lithic artefacts found at Tsagaan Turuut River sites are comparable with assemblages dating to the Upper Paleolithic and perhaps more to the Initial Upper Paleolithic and Early Upper Paleolithic Periods, such as Chikhen-2 Stratum 2.5-3 [13], Tsagaan Agui [7], Tolbor-15 Horizon 6-7 [16, 17], Tolbor-16 (former horizon 7, now AH6) [14], Tuin River, and Baidrag River [15].

Furthermore, it also has similar features with lithic artefacts assemblages from Russia such as in the Trans-Baikal region [18] and the Altai Mountains [19], and from China at site localities such as Shuidonggou [20], mostly dating between 45 and 35 ka. These observations must be confirmed by full-scale excavations and chronometric data.

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REFERENCES

1. Osborn, H. F., (1916). The origin and evolution of life upon the earth. The Scientific Monthly 3, pp. 5-22.
2. Rainger, R., (2004). An Agenda for Antiquity: Henry Fairfield Osborn and Vertebrate Paleontology at the American Museum of Natural History, 1890-1935. University of Alabama Press, Montgomery, AL.
3. Fairservis W. A., Jr., (1993). Archaeology of the Southern Gobi of Mongolia. Durham, North Carolina: Carolina Academic Press.
4. Kamennyi vek Mongolii: Paleolit i neolit severnogo poberezhya Doliny Ozer., (2000). Derevianko, A. P. Petrin, V. T. Tseveendorj, D. Devyatkin, E. V. Larichev, V. E. Vasilievsky, R. S. Zenin, A. N. Gladyshev, S. A. Novosibirsk: Izd. IAE SO RAN.
5. Derevainko, A. P., Dorj, D., Vasilevskii, R. S., Larichev, V. E., Petrin, V. T., (1986). Arkheologicheskiye issledovaniya v Mongolii v 1985 godu: obshiye svedeniya. Novosibirsk., Pp. 21. (Prepr. / AN SSSR. Sib. Ot-niye. In-t istorii, filologii i filosofii; AN MNR. In-t istorii).
6. Derevainko, A. P., Olsen, J. W., Tseveendorj, D., Krivoshapkin, A. I., Petrin, V. T., Brantingham, P. J., (2000). Mnogosloinaya peshernaya stoyanka Tsagan Agui v Gobiiskom Altaye (Mongoliya)

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DOI: https://doi.org/10.5564/pmas.v60i1.1332

//Arkheologiya, etnografiya I antropologiya Evrazii. №1 (1), pp. 23-26.
7. Derevianko, A. P., Brantingham, P. J., Olsen, J. W., Tseveendorj, D., (2004). Initial Upper Paleolithic Blade Industries from the North-Central Gobi Desert, Mongolia. In The Early Upper Paleolithic beyond Western Europe. Berkeley, Los Angeles, London: Univ. of California Press, pp. 207-222.
8. Mongol Ulsiin Undesnii Atlas. UB., 2009. p. 67.
9. Renfrew, C & Bahn, P., (2008). Archaeology: Theories, Methods and Practice. (5th Edition). London, Thames and Hudson Ltd. Pp. 78-79.
10. Lynch, Tim., (Nov. 2006). British Heritage; Vol. 27 Issue 5, pp. 52-54.
11. Adkins, R&L and Leitch. V., (2008). The Handbook of British Arcaheology (Revised Edition). London. Constable & Robinson Ltd.
12. Derevianko, A. P., Markin, S. V., Gladyshev, S. A., Olsen, J. W., (2015). The early Upper Paleolithic Period of the Gobi Altai (based on materials from Chikhen-2). Archaeol. Ethnol. Anthropol. Eurasia 3, pp. 17-41.
13. Zwyns, N., Gladyshev, S. A., Gunchinsuren, B., Bolorbat, Ts., Flas, D., Dogandzic, T., Tabarev, A. V., Gillam, J. C., Khatsenovich, A. M., McPherron, S. P., Paine, C. H., Purevjal, K. E., Stewart, J. R., (2014). The open-air site of Tolbor 16 (northern Mongolia): preliminary results and perspectives. Quaternary International 347, pp. 53-65.
14. Tserendagva, Ya., Derevainko, A. P., Tseveendorj, D., (2017). Bayankhongor aimgyn khuuchin chuluun zevsgyn dursgaluud. IHA, UB.
15. Gunchinsuren, B., Gladyshev, S. A., Bolorbat, Ts., Tabarev A. V., Odsuren, D., Tsybankov, A. A., Chargynov, T. T., (2010). New data on the study of the multilayer Palaeolithic site of Tulber-15 in 2009. Archaeological study 29, pp. 5-31.
16. Bolorbat, Ts., Gunchinsuren, B., Odsuren, D., (2017). The case of Ikh Tulbur valley: stone tools and beads. Studia Archaeologica 36, pp. 55-64.
18. Zwyns, N., Lbova, L.V., (2018). The Initial Upper Paleolithic of Kamenka site, Zabaikal Region (Siberia): A closer look at the blade technology. Archaeological Research in Asia 30, pp. 1-26.
19. Zwyns, N., Rybin, E. P., Hublin, J. J., Derevianko, A. P., (2012). Burin-core technology & laminar reduction sequence in the Initial Upper Paleolithic from Kara-Bom (Gorny-Altai, Siberia). Quaternary International 259, pp. 33-47.
20. Li, F., Kuhn, S. L., Gao, X., Chen, F., (2013). Re-examination of the dates of large blade technology in China: a comparison of Shuidonggou Locality 1 and Lovality 2. Journal of Human Evolution 64 (2): pp. 161-168.