doi:10.17746/1563-0110.2023.51.3.086-095

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A New Type of IUP Settlement in the Selenga River Basin, Northern Mongolia: The Kharganyn Gol-13 Short-Term Occupation Site

Here we outline the results of excavations at a recently discovered Initial Upper Paleolithic site, Kharganyn Gol-13, located on a tributary of the Selenga River in northern Mongolia. The Selenga valley and those of its tributaries were key routes along which humans dispersed during the Initial Upper Paleolithic. The concentration of sites of that period is highest here. Most are situated near outcrops of lithic raw material and are classified as relatively long-term quarry-workshops. Excavations at Kharganyn Gol-13 have revealed a single cultural layer in sediments damaged by bioturbation and slope processes. We describe the stratigraphy and spatial structure of the site and its lithic industry, which is shown to belong to the Initial Upper Paleolithic, being dominated by opposite platform bidirectional blade reduction. Analysis of the lithics reveals a lack of available raw materials nearby. Apparently, cores brought to the site were already prepared. All cores are heavily reduced and scarce, tools are frequent. The concentration of lithics is low. We conclude that the site, located at a distance from outcrops of suitable rocks on Selenga River tributaries, was a short-term camp associated with a specific activity.

Keywords: *Northern Mongolia, Initial Upper Paleolithic, technology, typology, settlement systems.*

Introduction

The earliest stage of the Upper Paleolithic in Northern Asia and Eastern Central Asia (50–42 ka BP) was associated with blade industries of the Initial Upper Paleolithic (hereafter, IUP) in those regions (Konstantinov, 1994; Derevianko, 2001; Tashak, 2011; Anoikin et al., 2019; Li et al., 2019; Zwyns et al., 2019).

The IUP of Southern Siberia and Central Asia can be identified by a stable set of reduction strategies and typological features. The manufacture of blades involved a technology based on sequential and alternating bidirectional subprismatic/asymmetric reduction of cores (Zwyns, 2021). IUP industries were distinguished by tool-markers with clear typological and morphological specificity (Rybin et al., 2022).

The diversity of natural environments revealing IUP manifestations suggests adaptive flexibility in the populations that possessed the behavioral pattern of this meta-culture. One of the most important dispersal routes for migrating populations was the transboundary valley of the Selenga River and its tributaries, connecting northern Mongolia with the western Transbaikal region. This is the area of the highest concentration of the IUP sites known so far (Ibid.). The appearance of assemblages of that period in the valleys of the adjacent right tributaries of the Middle Selenga River—Ikh-Tulburiyn Gol (Tolbor) and Kharganyn Gol (Tolbor Paleolithic district, Mongolia)—has been dated to ca 45 ka BP. The earliest manifestations of the IUP are known from industries at Tolbor-4 (horizon 6) and Tolbor-16 (horizon 6). The latest version of the IUP in that region is represented by the industry from Tolbor-21 (horizon 4), going back to ca 42–40 ka BP (Zwyns et al., 2019; Rybin et al., 2020).

These sites are usually located on piedmont alluvial fans of southern exposure, 500–1000 m from the modern riverbed, at relative heights of 25–40 m above the present level of the valley, and at absolute heights of 1000–1150 m above mean sea level. The vast majority of these sites are concentrated along a 10-kilometer stretch of these river valleys, which belongs to a latitudinally extending belt of metamorphosed Permian sedimentary rocks—silicites of the Tulbur suite, of various quality and suitable for the manufacture of stone tools. These sites are attributed to a single type of habitation associated with the use of lithic raw material outcrops located 100–200 m from them. The discovery of Kharganyn Gol-13, which differs markedly in a number of important aspects from the known IUP sites in that area, resulted from recent research work at these sites. This study analyzes technological features of the Kharganyn Gol-13 industry, reconstructs the degree of preservation of its sediments, establishes the stratigraphic sequence of cultural deposits, and identifies settlement types using the morphology of artifacts and the structure of lithic industries, comparing them with other IUP assemblages in the Tolbor district. This study also reconstructs one variant of the settlement systems among the population of the Middle Selenga River during the IUP.

Location, stratigraphy, and spatial structure of the site

The Kharganyn Gol-13 site is located in the valley of the Kharganyn Gol River—a small right tributary of the Altaatyn Gol River, which flows into the Selenga 19 km from the site (Fig. 1, *a*). During surveys undertaken in 2012 and 2014, the Joint Russian-Mongolian-American Archaeological Expedition discovered several Paleolithic sites in the valley, including Kharganyn Gol-13, with a surface occurrence of artifacts (Gladyshev et al., 2012; Gillam et al., 2014). The site is located on a gently sloping low piedmont fan, cut by erosion into several small areas, which has a southwestern exposure and is bounded by rocky ridges (Fig. 1, *b*). Outcrops of stone raw material have not been found near the site. The distance to the river is about 200 m; the height above the valley's bed does not exceed 10 m; the absolute height of the site is 1184 m above mean sea level.

During a survey conducted by the Russian-Mongolian archaeological expedition in 2018, the site was explored by means of four 1 × 2 m test pits made at different heights on the slope; here, exposed artifacts had been discovered. The two pits containing cultural layers exhibited similar stratigraphy. The most numerous finds were made in test pit 2, with a depth up to 245 cm, reaching the level of the weathering crust. Six distinctive artifacts occurred there in a compact vertical distribution (Rybin et al., 2018).

In 2022, a 3 × 2 m excavation pit with its long axis oriented SW-NE across the slope, was attached to 2018 test pit 2. Together with the test pit, a small section of which was not invesitgated in 2018, the total area of the excavation was 8 m^2. Deposits were uncovered to a depth of up to 210 cm; the description of the deposits is based on the northern wall of the excavation, oriented along the dip of the slope (Fig. 1, *c*, *d*; 2).

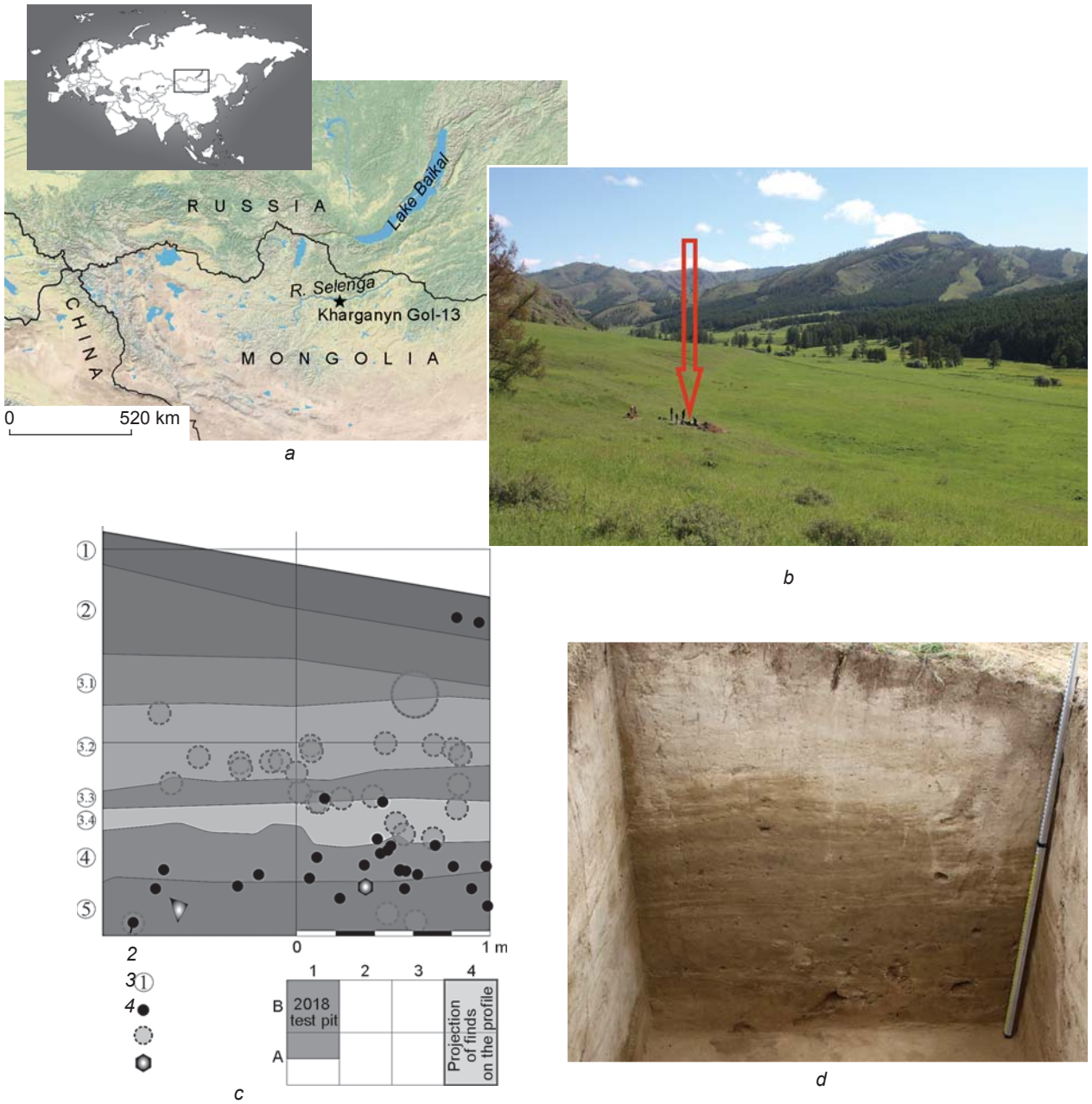

Fig. 1. Location of the Kharganyn Gol-13 site (*a*); general view of the site from the south (*b*); stratigraphic profile of lithological layers, northern wall of the excavation (*c*); photograph of the northern wall of the excavation (*d*).
1 – lithological layer; *2* – lithic artifact; *3* – rodent burrow; *4* – stone.

Layer 1 is modern soil; thickness 10–15 cm.

Layer 2 is uniform whitish-gray dense loess-like powdery sandy loam, with inclusions of fine gravel and crushed stone; thickness 40–50 cm. This layer overlies laminated deposits.

Layer 3 consists of alternating sublayers of light gray, dark gray, and brownish loose loam and sandy loam, 2 to 5 cm thick; total thickness 70–80 cm. This layer includes four lithological horizons.

Layer 4, at depths from 140 to 170 cm, consists of dense light loam, permeated with fine gravel in the middle. Most artifacts were discovered in the upper part of the layer; however, isolated artifacts and bones occurred up to the top of layer 5 (Fig. 2, *a*). The underlying sediments of layer 5 (visible thickness 30 cm) consist of loose homogeneous yellowish loam, with inclusions of local rock cobbles.

Despite the higher (relative to other sites in the Tolbor district) disturbance of sediments resulting from bioturbation and low-energy movement of sediments (traced by inclusions of laminar sublayers and by uneven boundaries of layers), the deposits at Kharganyn Gol-13 reveal the main level of occurrence of archaeological and faunal evidence. This is confirmed by the quantitative distribution of artifacts and animal bones. In the stratigraphic sequence, artifacts form a visible concentrated horizon, which, during excavations was designated archaeological horizon 4, corresponding to lithological layer 4. Finds in the upper and lower layers are often associated with rodent burrows (at least one-third of artifacts) (Fig. 2, *b*); artifacts may have been moved along them from the cultural layer. Rodent burrows occur mainly in the middle of the sequence (lithological layer 3), and occasionally in lower lithological layer 5. The finds are unevenly distributed horizontally, forming elongated clusters (Fig. 2, *c*).

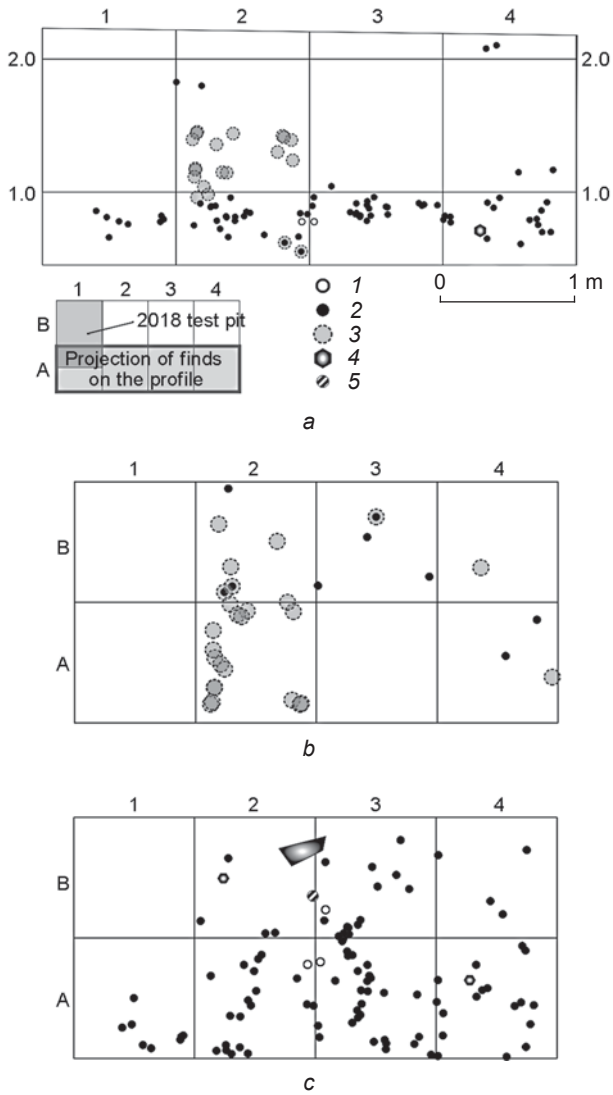

Fig. 2. Distribution of archaeological finds at Kharganyn Gol-13 in profile view along line A (*a*) and in plan view, in archaeological horizons 3 (*b*) and 4 (*c*).
1 – bone; *2* – lithic artifact; *3* – rodent burrow; *4* – stone; *5* – charcoal.

Archaeological assemblage

As is the case with all archaeological complexes in the Tolbor district, the raw material for the manufacture of most artifacts was silicites—sedimentary silicified rocks. Among these, nine varieties can be distinguished, differing in their petrographic features (Rybin et al., 2022). High quality rocks, which are homogeneous and fine-grained, and at the same time rarer varieties of silicites, represent type 2 (microcrystalline silicite, with a grain size of 0.005–0.01 mm, silty, with a predominantly coarse texture and occasional horizontal layering), and type 5 (fine microcrystalline carbonaceous silicite, with a thinly laminated texture). Raw material of type 1 (silicite calcitized to varying degrees, leucoxenized, and sulfated, with a predominantly coarse texture, sometimes showing uneven recrystallization of the main mass) is a more coarse-grained and internally heterogeneous rock than those described above.

The assemblage collected during the 2022 excavations contains 339 lithic artifacts, including debitage (Table 1). Paleontological evidence is scarce (11 spec.). Lithological layer 4 yielded the remains of a red deer (*Cervus elaphus*) antler and Mongolian kulan (*Equus hemionus*) humerus; lithological layer 5, a tooth fragment of a large bovid.

Judging by finds designated on the plan during excavations, and by technologically significant artifacts selected during screening, the amount of archaeological evidence increases from top to bottom of the section, and reaches its maximum in the cultural horizon of layers 4 and 5 (Table 1). In layer 1, six artifacts were found; in layer 2, 12; in layer 3, 17; in layer 4, 89; and in layer 5, 12 artifacts. Some artifacts revealed traces of patination of various degrees of intensity, which may indicate exposure on the surface. In layers 4 and 5, 14.9 % of finds were weakly patinated

(Fig. 3, *15*); the rest of the finds were unpatinated. The analysis of the assemblage from layers 1–3 reveals a different situation: debitage with weak or strong patina constitutes 25.7 % each, while unpatinated items account for 48.6 %. Deposition of most of the artifacts outside layer 4, we assume, resulted from bioturbation and slope wash. We analyzed two assemblages of artifacts: one consisted of items from layers 1–3, and another, from layers 4 and 5. Such differentiation was due to the fact that artifacts from layers 4 and 5, in our opinion, were least affected by post-depositional movement, and formed a relatively compact cultural layer. Finds from layers 1–3 were artifacts redeposited for various reasons; it would be to combine them with those from layers 4 and 5.

The assemblage from layers 4 and 5 totals 224 artifacts, including 101 technologically significant artifacts (Table 1). 80.1 % of the artifacts were made of the most common raw material of type 1; 18.9 %, of higher quality types 2 and 4. A comparison of the types of raw materials has shown that blades and flakes were made on most common 1 and 2 types of silicites, which suggests reduction within a single production process, and all cores were made on a rarer high-quality silicite of type 5. All

Table 1. **Typological distribution of artifacts from the Kharganyn Gol-13 site**

Type	Layers 1–3				Layers 4 and 5			
	Total, spec.	Including		%*	Total, spec.	Including		%*
		unretouched	tools			unretouched	tools	
Cores	1	1	–	2.9	3	3	–	3.0
Flakes	14	10	4	40.0	40	33	7	39.6
Blades	9	5	4	25.7	27	16	11	26.7
Bladelets	7	7	–	20.0	7	6	1	6.9
Cortical and semi-cortical blades	–	–	–	–	3	1	2	3.0
Crested and semi-crested blades	1	1	–	2.9	7	5	2	6.9
Side blades	–	–	–	–	3	2	1	3.0
Side flakes	–	–	–	–	4	4	–	4.0
Laminar flakes	2	2	–	5.7	3	2	1	3.0
Core trimming elements	1	1	–	2.9	4	3	1	4.0
including those resulting from:								
removal of core flaking-surface	1	1	–	–	1	1	–	1.0
rejuvenation of the platform	–	–	–	–	2	1	1	2.0
removal of core ridge	–	–	–	–	1	1	–	1.0
Subtotal	35	27	8	100.0	101	75	26	100.0
Flakes < 3 cm	43	43	–	–	83	83	–	–
Chips	22	22	–	–	23	23	–	–
Chunks and shatters	15	15	–	–	17	17	–	–
In total	115	107	8	–	224	198	26	–

*Relative to technologically significant artifacts.

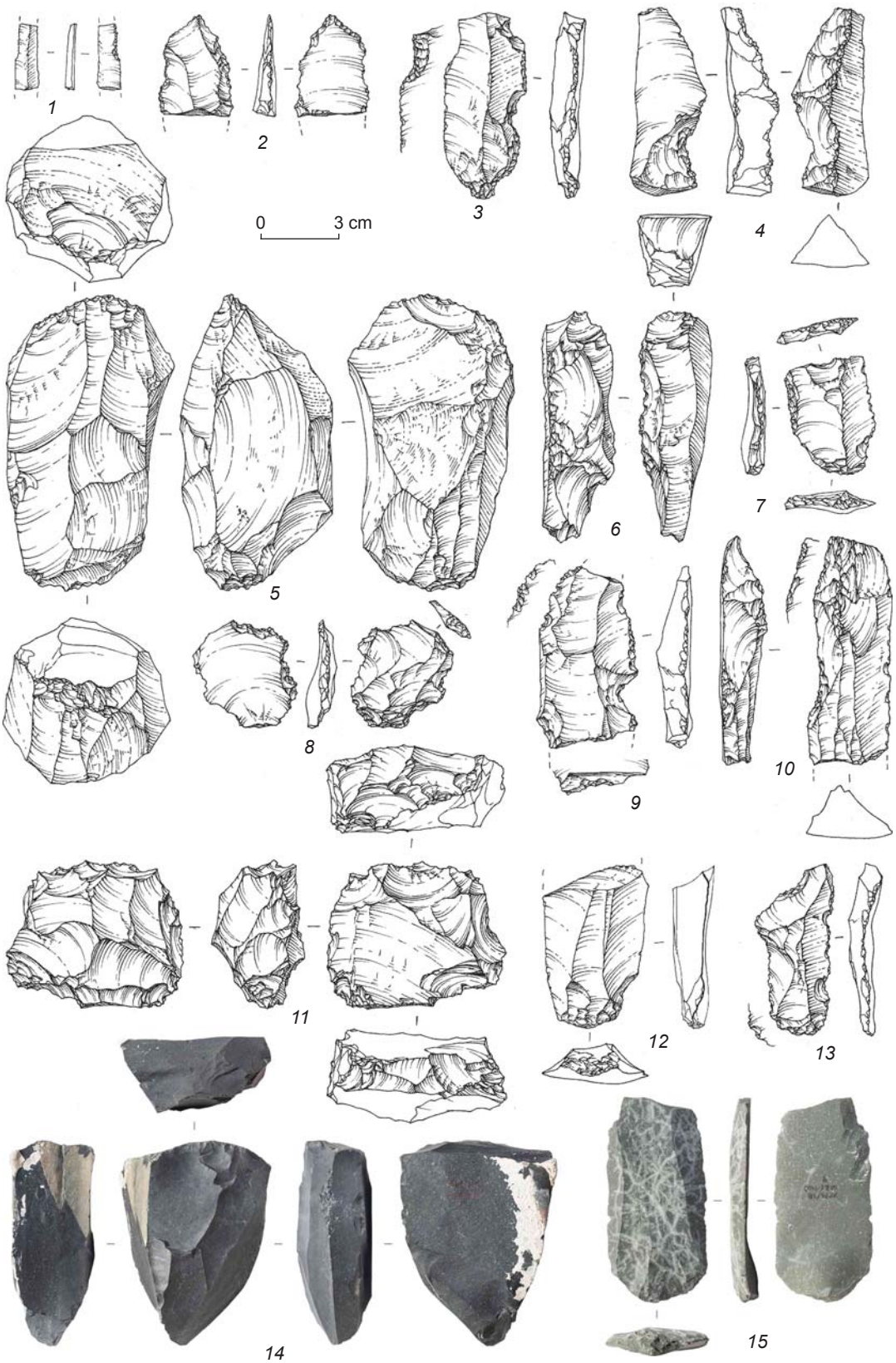

Fig. 3. Lithic artifacts from Kharganyn Gol-13. *Drawings by A.V. Abdulmanova; photographs by S.A. Kogai*.

the cores correspond to the final stage of flaking, since natural crust is absent from their working surfaces. In addition to a flat orthogonal core (Fig. 3, *11*), the assemblage includes a subprismatic nucleus with traces of bidirectional blade removals (Fig. 3, *5*). There is also an asymmetric core with two adjacent flaking-surfaces (Fig. 3, *14*), from layer 4 in test pit 2 excavated in 2018. A narrow-faced core on a marginal flake, bearing negative scars of unidirectional removals made after the detachment of a blank from the core, was similar in morphology to atypical core-burins (Fig. 3, *6*). Laminar pieces constituted a high share of all flakes: 46.5 % (Table 1; Fig. 3, *12*); flakes with remains of cortex on dorsal surfaces amounted to 45.5 %. The convex flaking-surfaces of cores were maintained by removing débordant flakes and blades and crested blades (Fig. 3, *4*, *10*). Different types of dorsal patterns of blades are dominated by parallel unidirectional scars (65 %); flakes with parallel bidirectional dorsal surfaces account for 25 %. Differentiation of laminar products by width revealed a series of small blades (≤12 mm; 23.4 %) (Fig. 3, *1*). The industry is dominated by medium-sized blades (20–40 mm; 51.1 % of all blades), while large blades (>40 mm) are rare (4.3 %). In terms of average metric parameters, relatively small blades (51 mm long, 25 mm wide, and 7 mm thick) dominate this assemblage. Natural and plain residual striking platforms of blanks prevail (71.7 %); the percentage of prepared striking-platforms (mainly dihedral) is 18.9 %. The technique of preparing the edge of the striking-platform by pecking, specific to the IUP, was recorded (Fig. 3, *12*, *15*).

The toolkit consists of 26 items, or one-fourth of all technologically significant artifacts (Table 1). Most of the tools (17 spec.) were made on laminar blanks. Retouched blades (5 spec.) and retouched flakes (6 spec.) are relatively numerous. Perforators/spur-like tools (6 spec.) form a significant series. There is a symmetrical point on a distal fragment of blade (Fig. 3, *2*). The industry shows the use of the intentional tool-fragmentation technique, manifested by the availability of one truncated (Fig. 3, *7*) and three multifunctional (Fig. 3, *9*) tools. There are five notched-denticulate pieces (Fig. 3, *8*, *13*); the same processing appears on a retouched bladelet (Fig. 3, *1*). One of the notched tools shows traces of another typical IUP method, namely, ventral trimming of the bulb of percussion (Fig. 3, *4*). Tools specific to the IUP (Rybin et al., 2022) include a multifunctional stemmed blade (Fig. 3, *3*); its proximal part on both longitudinal edges had been treated with intense abrupt scalar-stepped retouch. The toolkit of this industry exhibits a large proportion of fragmented items. Among 17 blades (tool blanks), only one is complete. The majority of tools exhibit traces of secondary trimming on one-quarter of their perimeter. The percentage of items with working edges subjected to strong or medium modification is high (15 % and 50 %, respectively). 7.7 % of tools have three or more morphologically different elements of secondary processing; 30.8 % of tools, two elements.

Artifacts from layers 1–3 were made of the same varieties of silicites as those from layers 4 and 5. Blanks from layers 1–3 and their preparation are similar to those from layers 4–5 at the site. The toolkit, consisting of eight items, includes non-serial varieties of simple implements, such as a single longitudinal side-scraper, an end-scraper, a spur-like tool, a retouched flake, three retouched blades (one with ventrally trimmed bulb of percussion), and a fragmented tool.

Discussion

The lithic industry rom layers 4 and 5 is characterized predominantly by specific bidirectional volumetric technology aimed at the production of mainly medium-sized and small blades based on the sub-prismatic/asymmetric volumetric reduction concept. Flaking surfaces were formed by preparation of plain, less often rejuvenated, striking-platforms with the use of overhang removal, reverse reduction, and pecking. The toolkit is sparse, and contains typical IUP varieties of tools.

These data indicate the absence of any significant qualitative and quantitative differences between the industries from layers 1–3, as well as 4 and 5. The upper layers of the site have not revealed any manifestations of a tradition different from that appearing in the main cultural layer. The sediments of the site contain only one cultural layer, with its matrix located in lithological layer 4. All artifacts contained in the over- and underlying sediments found their way to this layer as a result of post-depositional factors, such as bioturbation, slope movement of soil, etc. Thus, Kharganyn Gol-13 is

an exceptionally rare single-layer archaeological site of the IUP for the Tolbor district.

A very limited range of lithic raw materials was used at the site, which is extremely unusual for archaeological sites in the region. IUP assemblages of the Tolbor group usually testify to the use of all available varieties of silicites and other, rarer rocks (there are 13 main varieties). Since there are no primary outcrops of lithic raw material in the immediate vicinity of Kharganyn Gol-13 (which is also unusual for settlement systems in the Tolbor district), it can be assumed that all artifacts were brought to the site from distant locations. As mentioned above, all cores found in the excavation area reveal the final stage of reduction, and the percentage of items with cortex is quite large. Consequently, a small number of cores with initial preparation were brought to the site as raw materials, and their further reduction occurred in situ. The industry is distinguished by relatively small (in comparison with other IUP complexes in the region) cores and blanks, and by the high degree of fragmentation of the artifacts. This suggests intense and probably short-term use of tools designed to perform specific operations. Description of this complex can be supplemented by indicators revealing some aspects of the residential activities in the area of the site under study. The density of distribution of finds (including debitage; the 2022 excavation area alone was 6 m^2) is 37 lithic artifacts per m^2. This is one of the lowest values for IUP sites in the Tolbor district. The percentages of the main categories of lithic artifacts make it possible to classify the IUP industries of the Tolbor district as typical of sites located near rock outcrops (Table 2) (Rybin et al., 2022). According to the ratio of the number of technologically significant artifacts per core, a low intensity of reduction (from 15 to 25 blanks) can be reconstructed for such sites. Notably, the only sites with higher values of this indicator are both localities in the Kharganyn Gol valley, which is located on the periphery of the lithic raw material belt. Evidence from Kharganyn Gol-13 testifies to the intense production and use of tools (the number of unretouched blanks per tool), since every second or third flake was subjected to secondary trimming. These values are half as much at other sites, except for Tolbor-16. As to the efficiency of activities associated with tool manufacturing, it was low in almost all sites in the Tolbor district (2–5 tools per core), with the exception of sites in the Kharganyn Gol valley (6–8 tools per core), and approaches values recorded

Table 2. **Ratios of main categories of artifacts from the IUP assemblages of the Tolbor district**

Site	Archaeological units	Cores : tools*	Tools : unretouched blanks*	Cores : blanks + tools*	Cores : tools**	Tools : unretouched blanks**	Cores: blanks + tools**	Cores, % of the assemblage***	Blanks, % of the assemblage***	Tools, % of the entire assemblage	Debitage, % of the entire assemblage	Source
Tolbor-16	Horizon 6	1:5.7	1:2.1	1:15	–	–	1:5	6.2	64.1	29.7	62.9	Zwyns et al., 2019
Tolbor-21	Excavation pit 2, Horizon 4	1:3	1:6	1:22	1:1.8	1:6	1:13	4.2	82.8	13	32	Rybin et al., 2020
Tolbor-4	Horizon 5a	1:2.3	1:6	1:15	1:1.7	1:7.2	1:9.5	6.4	76.6	17	46.6	This study
	Horizon 6 (2006)	1:4.2	1:5	1:25	1:2.6	1:5	1:16	3.8	80	16.2	47.7	Rybin et al., 2022
Kharganyn Gol-5	Horizon 5	1:6.1	1:7.8	1:44,5	1:3.9	1:8.2	1:36	1.8	86.9	11.3	41.4	Khatsenovich et al., 2017
Kharganyn Gol-13	Layers 4–5	1:8.6	1:2.7	1:32,6	1:4.6	1:2.9	1:18	3	71.2	25.7	60.2	This study

*Including fragmented artifacts.

**Only complete blanks and proximal fragments.

***Excluding debitage.

at IUP sites in the Transbaikal region, where raw materials were probably transported in from other places (Lbova, 2000).

Conclusions

The features revealed at the single-component Kharganyn Gol-13 site make it possible to attribute its lithic industry to the Selenga variant of the IUP. Several factors may have affected its structure. The main factor was the lack of outcrops of suitable lithic raw material in the vicinity of the site, which forced its inhabitants to bring already prepared cores there. Short-term, but intense human activities in this locality were associated with the manufacture, processing, and use of tools. The site was situated in the extension of a river valley, not far from rock outcrops that formed a relatively narrow space; it was a convenient place for hunting animals. IUP humans in northern Mongolia hunted large mammals (equids and bovids), which required constant movement. Another factor that determined the choice of site location was the availability of nearby lithic raw materials suitable for tool manufacturing. Until recently, quarry-workshop sites located near raw material outcrops were considered to be the only type of IUP settlement in the Tolbor district. During our study of Kharganyn Gol-13, we reconstructed the features of this short-term hunting camp, the inhabitants of which may have been engaged in the pursuit and utilization of game animals. This conclusion is indirectly confirmed by a few bones found at the site, which reflect the nutritionally valuable parts of animal carcasses. Kharganyn Gol-13 differs from other settlements in the absence of sources of lithic raw materials nearby. This feature suggests a more diverse settlement system than was previously assumed. Such complexes include small IUP sites (Rybin et al., 2016) characterized by small numbers or a complete absence of cores, a high percentage of tools, and a low density of distribution of artifacts and bones. These are known from the "dead-end" right tributaries of the Selenga River, outside the most actively populated valley of the Ikh-Tulburiyn Gol with its rich outcrops of stone raw materials, which was a "transitional route" for IUP populations. Thus, the IUP mobility system in northern Mongolia entailed the establishment of camps designated for different settlement activities.

Acknowledgments

This study was supported by the Russian Science Foundation, Grant No. 19-18-00198 "Development of the Culture of the Initial Upper Paleolithic in Eastern Central Asia and Southern Siberia: Polycentrism or Transfer of Cultural Traditions along the Northern Path of Distribution of *Homo sapiens* in Asia".

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Received March 13, 2023.
Received in revised form April 10, 2023.