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Review Article

Upper Paleolithic Sites of the Tunka Rift Valley (Southwestern Cis-Baikal Area, Siberia): A Short Review

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Abstract

Here we present a brief description of Paleolithic archaeological sites in Tunka rift valley in Baikal region, Siberia, Russia. Among ten sites of Paleolithic age currently known in the Tunka valley only 5 sites are stratified while all the others are represented by picking archaeological material. The most representative sections with rich archaeological complexes in the Tunka rift are the sections of the subaerial deposits of Tuyana and Bol'shoi Zangisan. The industry of Tuyana site contains products and technologies that can be identified as Aurignacoid. This is evidenced by the presence of typical Aurignac forms in the groups of cores, flakes, points, scrapers and blades. A distinctive feature of the stone industry is the presence of a large number of carinated cores and points. Close in appearance to the Tuyana industry are artifacts from Big Zangisan site with carinated, terminal core forms, microcores, microflakes and geometric microliths. The lifetime of Aurignacoid complexes in the Tunka valley is determined within the range of 14C 47000–30000 BP. In the remaining three sections, the findings of archaeological material are sporadic and dispersed throughout the strata. Close in age are Slavin Yar, Bely Yar 2 and Zaktui sections.

Keywords: Baikal area, Tunka rift valley, Late Quaternary, Upper Paleolithic sites, geoarchaeology

Introduction

The Tunka rift valley (Figure 1) extends for 200 kilometers in a sub-latitudinal direction from the southwestern flank of Lake Baikal to Lake Hovsgol. This is a deep topographic depression in the form of a chain of upland basins between two large alpine systems - alpine-type Tunka Goltsy and Khamar-Daban ridge. The depression's floors are occupied by low and wide (up to 30 km) plains. In this through passage in the Sayan-Baikal mountain belt, in a peculiar orographic neck, the taiga territories of the Baikal region are as close as possible to the steppe landscapes of Mongolia. This geographical position of the Tunka valley turned it to an actively used migration corridor, including in prehistoric times. Therefore, the Tunka rift from the very beginning of archaeological research in the region was considered as one of the most promising for the

search for archaeological sites, and in particular the Paleolithic ones. Nevertheless, despite the more than 100-year history of archaeological research, a small number of such objects (about 50) are known in the Tunka valley, and only ten of them are identified as Paleolithic. Most of them contain only picking archaeological material or individual objects in the Upper Pleistocene sediments [1]. Until recently, only one stratified Paleolithic site was known here. The expansion of the list of Paleolithic objects in the Tunka valley occurred as a result of a comprehensive study of Quaternary sediments, which was carried out since 2010 by employees of the Institute of the Earth's Crust SB RAS and Irkutsk State University (Irkutsk) [2,3,4,6]. Now, a new "cultural area" is being allocated on the territory of the Tunka valley [5], as part of the domain of Aurignacian cultures distributed in Europe, Western and Central Asia [6].

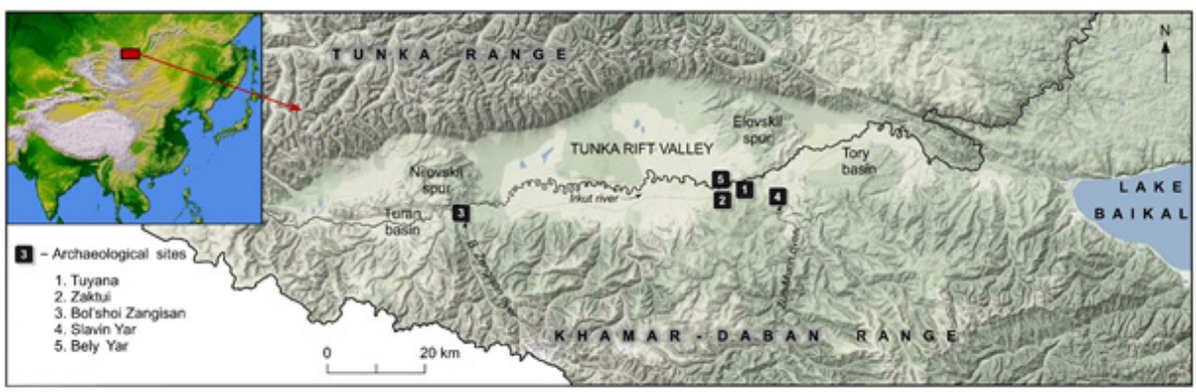

Figure 1: Schematic map of the Tunka rift valley illustrating the location of archaeological sites mentioned in the text.

Specific Features of Paleolithic Sites Localization

The relatively small number of Late Pleistocene archaeological sites currently known in the Tunka valley is due largely to the low modern population density and relatively remote and rural setting, as well as local neotectonic and associated sedimentary processes. The internal structure of the rift shows intense tectonic subsidence resulting in enlargement and deepening of the basins whose bottoms include low-lying accumulative plains and lake systems subject to deposition and burial by younger sediments [2]. The rate of tectonic subsidence of the Tunka rift basin is exemplified by the occurrence of late Holocene artifacts namely remains of wooden structures built with an iron axe, found at a depth of more than 12 m beneath alluvium on a low floodplain [7]. However, active tectonic development of the Tunka rift in particular areas is complicated by local uplifts and linear erosion and exhumation of pre-Holocene sediments, occurring against the backdrop of general subsidence of basement blocks [8-10]. Such inverted parts of the Tunka rift, where basin accumulation processes changed to denudation, occur primarily along basin margins where they intersect with the foothills of the Khamar-Daban Range and inter-basin spurs.

Upper Pleistocene Archaeological Cross-Sections

Paleolithic sites in Tunka rift are found in different types of Quaternary deposits. Up to now only five stratified Paleolithic sites are known in Tunka rift (see Figure 1): Tuyana, Zaktui, Bol'shoi Zangisan, Slavin Yar, Bely Yar 2. The first three sites are found in the sections of loess-like cover which are represented mainly by loam and silty loam while sites Slavin Yar and Bely Yar 2 are located in sandy deposits of different grain size composition (Figure 1).

Tuyana section (51°42′49.12″N, 102°41′48.27″E) is located (see Figure 1) at the Khamar-Daban ridge piedmont on a gently inclined slope with altitudes of 15-35 m above the Irkut River shoreline. The excavation of the sediments up to a depth of 3.4 m has shown that the sediments are represented by Late Pleistocene-Holocene cover of loessificated sandy loams and loess-like loams. The lower part of the section is represented by loess-like loams underlayed by cryoturbated soils. The upper part of the section is represented by obscure layered sandy loams, which can be attributed to the Younger Dryas.

The Tuyana site is the most representative multi-layered archaeological site within the Tunka rift valley. Here, the bulk of archaeological material was primarily received from the Holocene and Kargiansk (MIS 3) sediments and cryoturbated soils. The archeological material of the Tuyna site contains products and technologies that can be identified as the Aurignacoid industry of the Upper Paleolithic with characteristic macro- and microforms [6]. This is evidenced by the presence of typical Aurignac forms in the groups of cores, flakes, points, scrapers and blades. A distinctive feature of the stone industry is the presence of a large number of carinated cores and points.

Two buried soils samples from the depths of 0.7 m and 2.4m and one bone of the large mammal were dated using AMS 14C method in the AMS Center of the Korea Institute of Geoscience and Mineral

Resources (KIGAM, Korea). Their 14C age is 6820±40 BP (KGM-ISa 170093) and 32250±190 BP (KGM-ISa 170094), respectively [11]. Some more dates by three bone samples of large mammals found in the archaeological horizon were obtained in KIGAM 27380 ± 150 BP (KGM-IBn170036) and in the laboratory of Keck Carbon Cycle AMS Facility (University of California, Irvine, USA) 27 030±270 BP (UCIAMS-186319) and 47 800±3500 BP (UCIAMS-186320) [11].

Zaktui section (51°42'20.62"N, 102°39'24.39"E) is located (see Figure 1) at the piedmont of the Khamar-Daban ridge on the right bank of the Irkut River. Here, the basin sediments are involved into the low-amplitude inversion uplifts of the piedmont structures and form gentle undulating plains. The lower segments of these plains are characterized by an accumulative or socle structure. The excavated succession of sediments up to 5.5 m depth begins from a buried soil horizon of the Karginsk age (MIS 3) heavily deformed by solifluction. The overlapping strata are represented by sandy loam and sand; in the upper part they become loess-like with traces of slope processes reworking. Sediments from the top of the section are intensely ferruginated.

Quartzite microblades and microflakes were found in the wall of outcrop located in the immediate vicinity of the excavation site, in the Early Karginsk (MIS 3) talus sediments at a depth of 4.2 m. This layer is dated of > 50 100 14C BP (OxA-25678) obtained by the elk bone (Alces sp.) [4]. Additional 14C dates were obtained from overlapped sediments. Two dates are obtained at a depth of 2.3 m 33090 ± 250 BP (OxA-21014), 35560 ± 300 BP (OxA-19719) and one more at a depth of 1.4 m - 5710 ± 90 BP (IGAN 4151).

The first stratified Upper Palaeolithic site identified in the Tunka valley is known as Bol'shoi Zangisan [3] (51°40'4.91"N, 101°49'30.20"E). The site is located (see Figure 1) at the base of the Nilovskii inter-basin spur on the left bank of the estuary of the river of the same name. The Bol'shoi and Malyi Zangisan rivers flow from the Khamar-Daban Range and join the Irkut River three kilometers apart, where the latter river intersects the conjunction zone between the Nilovskii spur and the Khamar-Daban Range. The Tunka valley narrows and is antecedent here. Where this occurs, both Zangisans have thick alluvial fans which have merged together, forming a common front that meets the southern end of the Nilovskii spur and pushes the Irkut River towards its slopes. In the exposed cross-section of the alluvial fan, the boulder-to-pebble layer is covered by thick (up to 7 m) loess-like sandy loam and loam deposits.

In general, the upper part of the Bol'shoi Zangisan section is represented by bleached and carbonate-rich loess-like sandy loams. The sediments become coarser towards the base of the section where the sandy loams change gradually to bluish-gray and light-brown ferruginized loams with poorly defined undulating laminations. These lower blanket deposits also reveal the cryogenically altered humus-rich pedocomplex (associated with the optimum of MIS3 dated to ~35000-45000 14C BP) [3]. The archaeological materials recovered at Bol'shoi Zangisan were found during excavation of several test pits. In addition to techno-forms and methods of core production, represented by massive choppers and radial and parallel knapping typical for Upper Pleistocene sites in Cis-Baikal area [12], including cortex flakes and dihedral and trihedral blades, the lithic industry clearly shows edge-faceted microblade production, a technology made possible by the locally available high-quality flint and microquartzite found among the river gravels [3].

Slavin Yar section (51°42'11.60"N, 102°49'17.11"E) is located (see Figure 1) on the southwestern margin of the Tory depression on the left bank of the Zun-Murin River, 11 km from its mouth. This is lithostratigraphically the most complete and complex exposure of the Upper Quaternary sediments in the South-Western Baikal region. Lithologically heterogeneous sediments of a total thickness of up to 33 m lie on the eroded surface of Neogene conglomerate with angular unconformity. Close-packed boulder pebbles of mountain alluvium, overlapped by sandy sediments with the horizons of buried soils are exposed in the bottom of the section. The section is crowned by a layer of loess-like sandy loams. The age of sediments in the middle part of the Slavin Yar section at a depth of 8 m was estimated by 14C dating as 37790 ± 310 BP (TO-13278) and at a depth of 11.5 m - as 45810 ± 4070 BP (IGAN 3133). High-profile scraper made from white quartz-vein pebble was found in the paleosol at a depth of 10.9 m. Flaked humerus of Equus sp. was found at the depth of 18.5 m, [3].

Bely Yar 2 (51°42'51.37"N, 102°37'59.69"E) is located (see Figure 1) on the left bank of the Irkut River at the eastern flank of the Tunka depression, at the piedmont of the Elovskii spur. There, on the basement of tertiary tuffogenic sandstones and breccias lie a complexly constructed strata of the Upper Pleistocene represented predominantly by sandy sediments of 16 m thickness. Sediments of flood-plain lake alluvial facies represented by interlayering of silty and sandy loams, loams, gray sands and peat containing vegetable detritus (fragments of wood, bark, branches, cones, etc.) are exposed at the base of the Quaternary part of section.

They are covered by sands and sandy loams, which are substantially loessificated in the top of the section. The 14C date 44200 ± 4500 BP (IGAN 3370) was obtained in the section Bely Yar 1 at a depth of 22.5 m. A beyond-limit 14C date > 50000 BP (Poz-86349) was obtained in the Bely Yar 2 section, near its base at a depth of 16.5 m. One more radiocarbon date of 14C 41000 ± 1000 BP (Poz-86144) for the lower part of the section was obtained at a depth of 15 m. The 14C date for the upper part of the section of 17850 ± 90 BP (OxA-27618) was obtained at a depth of 6.5 m [2]. In this section also the only archaeological artifact was found at a depth of 11.4 m, - the preform on a large chipped quartzite pebble.

Conclusion

The above review shows that Upper Paleolithic sites in Tunka valley are characterized by Aurignacoid complexes with proximate life time range of 14C 47000–30000 BP. The geomorphological and geological situation in those sites demonstrates certain regularity. Although all sites are nearly of the same age, they differ significantly in their filling with archaeological material. Sites with the widest set of artifacts (Tuyana, Zaktui and Bol'shoi Zangisan sites) are associated with loess-like deposits which contain a number of paleosol horizons, while the Bely Yar site with only single archaeological finding, is represented by sand. This testifies to the preference of an ancient human to live in certain landscapes.

The most promising is the site of Tuyana where typical Aurignac forms in the groups of cores, flakes, points, scrapers and blades were found. A distinctive feature of the stone industry is the presence of a large number of carinated cores and points. The second perspective site seems to be Bol'shoi Zangisan site with carinated, terminal core forms, microcores, microflakes and geometric microliths. Quartzite microblades and microflakes in Zaktui section are rare and were found in only talus sediments, so they can be redeposited. Slavin Yar and Bely Yar sandy sections seems to be the most unpromising for archaeological study in the Tunka rift valley.

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Conflict of Interest

No conflict of interest.

References

1. Berdnikova N E, Berdnikov I M, Rogovskoy E O, Timoshchenko A A, Ulanov, I V (2014) Novyye arkheologicheskiye ob «yekty v Tunkinskoy kotlovine (Baykal'skaya riftovaya zona) (New archaeological objects in the Tunka basin (Baikal rift zone). Yevraziya v kaynozoye. Stratigrafiya, paleoekologiya, kul'tury 3: 19-41.
2. Shchetnikov, A A, White D, Filinov I A, Rutter N (2012) Late Quaternary geology of the Tunka rift basin (Lake Baikal region). Journal of Asian Earth Sciences 46: 195–208.
3. Kozyrev A, Shchetnikov A, Klement'ev A, Filinov I A, Fedorenko A, et al. (2014) The early Upper Palaeolithic of the Tunka rift valley, Lake Baikal region, Siberia. Quaternary International 348: 4-13.
4. Shchetnikov A.A, Khenzykhenova F.I, Klement'ev, A.M, Simakova, A.N, Semenei, E.Y, et al. (2015) Changes of environments and climate during the Late Pleistocene and Holocene reconstructed from aeolian and colluvial deposits of the Zaktui site (Tunka rift valley, Baikal region). Quaternary International 35: 80-89.
5. Boëda, E (2005) Paleo-technology or anthropology of techniques? Arob@se 1: 46–64.
6. Rogovskoy E O, Berdnikova N E, Lipnina E A, Vorobyova G A, Berdnikov I M (2017) Paléo-technologie ou anthrop Paleolit Tunkinskoy doliny (Paleolithic features of the Tunka Valley). In: Materials of the V (XXI) All-Russian Archaeological Congress. The ASU Publishing House, Barnaulologie des Techniques, pp. 871–872.
7. L'vov A S (1924) The geological past of the middle part of Irkut valley, from Tunka trough to Zyrkun Ridge. Reports of the Russian Geographic Society 46(3): 1-84.
8. Ufimtsev G F, Perevalov A V, Rezanova V P, Kulagina N V, Mashchuk I M, et al. (2003) Thermoluminescence (TL) dating of Quaternary sediments of the Tunka rift. Russian Geology and Geophysics 44(3): 226-232.
9. Ufimtsev G F, Shchetnikov A A, Filinov I A (2009) Inversions in the contemporary geodynamics of the Baikal rift zone. Russian Geology and Geophysics 50(7): 798-810.
10. Shchetnikov A A (2008) The manifestation of a Gobi mechanism of orogenesis in the Baikal rift system (using the Tunka rift as an example). Geography and Natural Recourses 29: 226–229.
11. Shchetnikov A A, E V Bezrukova, A Yu Kazansky, G G Matasova, Ivanova FI (2019) The Tuyana section – a multiproxy record of sedimentation and environmental history during the Late Pleistocene and Holocene in the Tunka rift valley, Baikal region. Quaternary International 534, pp. 138-157.
12. Medvedev G I (1990) Stratigraphiya, paleogeographiya i archeologiya iuga Srednei Sibiri (Stratigraphy, Paleogeography and Archeology in Southern Middle Siberia). Irkutsk, ISU, pp. 166.