Regional Variability of Mesolithic Cultures in the Ustyurt and Kyzylkum Areas

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Abstract. The Mesolithic period in Central Asia, particularly in the territory of modern Uzbekistan, represents a critical transitional phase in prehistoric cultural development. Despite a growing body of archaeological evidence, this era remains underrepresented in broader Eurasian discourse. This study integrates archaeological fieldwork, typological and traceological analysis of lithic assemblages, faunal remains examination, and paleogeographic data. More than 200 Mesolithic sites — including stratified and surface contexts — were documented across diverse ecological zones: Fergana, Ustyurt, Kyzylkum, Surkhandarya, the Zarafshan valley, and the so-called "Central Asian Mesopotamia." The assemblages consist of microliths, scrapers, geometric tools, retouched blades, and grinding implements, indicating specialized toolkits and functional site differentiation. Settlement types range from long-term residential camps to short-term hunting stations, reflecting adaptive strategies to varied environments. Subsistence was based on hunting and gathering, with evidence of early hide processing, woodworking, and plant exploitation. Isolated faunal remains from sites such as Machay and Obishir 5 suggest tentative early steps toward animal domestication.

INTRODUCTION

The Mesolithic, or Middle Stone Age, represents a pivotal phase in the prehistory of Central Asia. In the territory of modern Uzbekistan, this period emerged around 10,000 years ago and is marked by profound environmental, technological, and cultural transformations. During this time, a more humid climate prevailed across the Central Asian plains. Tugai (riparian) forests spread along river valleys and wetlands, creating favorable ecological conditions that supported diverse human adaptations.

Microlithic industries characterized by small, retouched stone tools often of geometric shapes are the hallmark of this era. Numerous Mesolithic sites in Uzbekistan have yielded such artifacts, reflecting the development of specialized toolkits and subsistence strategies. Well-documented sites include Machay, Kushilish, Sazagan 1, the Obishir cave complex (Obishir 1–5), Ashy-Kul, and multiple open-air sites in Fergana, Ustyurt, and Kyzylkum.

To date, archaeologists have identified over 200 Mesolithic sites in Uzbekistan, including approximately 30 stratified locations. These can be grouped into two broad categories: cave and rock shelter sites (e.g., Obishir, Machay, Kushilish, Karakamar, Ochilgor), and open-air settlements (e.g., Aidabol 25, Lavlakon 24, Charbakty). Chronologically, the Mesolithic in Central Asia spans the 11th to the 7th millennia BCE [6; 12].

One of the most significant regions for understanding Mesolithic settlement and lifeways is the Ustyurt Plateau. During the second half of the 20th century, E.B. Bizhanov and A.V. Vinogradov recorded around 20 Mesolithic sites in this area. These are primarily open-air sites lacking stratigraphic context and are typically located in environmentally marginal zones such as takyrs, salt flats, sandy areas, and along ancient riverbeds. Notable sites include Aidabol 25 (yielding over 2,000 artifacts), Aktaylak (14,000 artifacts), and Kiyikshingrov 2 (12,000 artifacts). Smaller, short-term stations such as Aidabol 15 and Churuk 2 produced fewer than 100 artifacts, while medium-sized sites like Aidabol 16 and Aktobe 2 yielded over 5,000 artifacts each [13-39].

According to A.V. Vinogradov, many of these sites contain assemblages ranging from 200 to 1,000 lithic artifacts, suggesting temporary or seasonal occupations. Following the classification proposed by F. Hole and K.V. Flannery (1967), Mesolithic sites on the Ustyurt Plateau can be grouped into three types:

1. Seasonal base camps;

2. Specialized hunting and butchering stations;
3. Short-term transit camps.

Assemblages from base camps tend to be more numerous and multifunctional, whereas those from butchering sites focus on specialized tools used for hide processing and animal carcass treatment. Short-term sites are generally limited in artifact diversity and quantity but still reflect the broader cultural patterns of the period [2-3].

Despite the richness of archaeological data, the Mesolithic of Uzbekistan remains underrepresented in global academic discourse. This study aims to bridge that gap by systematically analyzing settlement patterns, technological practices, and economic strategies across key Mesolithic regions of Uzbekistan. Through this work, the Mesolithic of Central Asia can be better positioned within broader Eurasian debates concerning the origins of sedentism, early domestication, and the transition to Neolithic lifeways.

EXPERIMENTAL RESEARCH

This study is based on a combination of archaeological fieldwork, typological and technological analysis of lithic artifacts, and paleoenvironmental reconstruction. The research draws on data collected from over 200 Mesolithic sites in Uzbekistan, including stratified and non-stratified localities across diverse ecological zones - Ustyurt Plateau, Kyzylkum Desert, the Fergana Valley, Surkhandarya region, and the Zarafshan basin.

Field surveys and excavations were conducted between 2018 and 2023, in collaboration with regional archaeological institutes under the supervision of the Academy of Sciences of Uzbekistan. Stratified sites such as Sazagan 1, Obishir 1–5, and Karakamar were excavated using standard stratigraphic methods. Grid-based excavation units (2×2 m) were employed, with systematic recording of stratigraphy, spatial distribution of artifacts, and sediment characteristics. Surface sites (e.g., Aidabol 16**,** Lalyakan 24**,** Churuk 2) were documented through systematic collection grids and GPS mapping [1].

All finds were assigned contextual codes and entered into a digital database including information on coordinates, depth, lithology, and artifact associations.

Lithic assemblages were analyzed according to standard typological and technological criteria [11; 14]. Each artifact was classified based on:

- Raw material (flint, quartzite, obsidian, etc.);
- Blank type (flake, blade, microblade);
- Core reduction strategy (prismatic, conical, bipolar, etc.);
- Tool type: microliths, backed blades, scrapers, trapezes, burins, end-scrapers, retouched blades, notched tools, and others;
- Retouch type (blunt, semi-abrupt, scalar, inverse);
- Technological features: platform preparation, dorsal scar pattern, bulb of percussion.

Assemblages from Ustyurt (e.g., Aidabol 25, Aktaylak 1), Kyzylkum (e.g., Lalyakan 41, Daryasay), and Zarafshan (e.g., Charbakti 12, Sazagan 2) were compared to assess regional variability and chronological trends.

A sample of 150 stone tools from stratified contexts (primarily Obishir 5, Sazagan 1, Charbakti 11) was subjected to use-wear analysis. The methodology followed the approach of Semenov (1964) and Keeley (1980), combining low-power (10×–50×) and high-power (100×–500×) microscopy to identify edge damage, polish, and striations. Observations were compared with experimental reference collections to infer tool function and worked materials (e.g., hide, wood, plant, bone).

Radiocarbon dating (AMS) was conducted on charcoal and faunal remains from Sazagan 1 and Obishir 3. Dates were calibrated using the IntCal20 curve [13]. In regions lacking direct radiocarbon evidence (e.g., Ustyurt, Kyzylkum), relative chronology was inferred through techno-typological comparison with dated sites in Central Asia and adjacent areas (e.g., Caspian and Southern Ural Mesolithic).

Environmental conditions were reconstructed based on sedimentological data, geomorphological observations, and regional paleoclimatic studies. Site distribution was correlated with Holocene water sources (paleochannels, springs, lake margins) using GIS-based mapping. Evidence from pollen and phytolith studies from nearby Holocene deposits was used to infer vegetation and habitat types [4-5].

Primary data were supplemented by the published works of E.B. Bizhanov (1978, 1982, 1996), A.V. Vinogradov (1981), U.I. Islamov (1975), and N.U. Kholmatov (2005, 2007), among others. These materials provided essential context for identifying site industries, distribution patterns, and cultural affiliations [9].

RESEARCH RESULTS

As evidenced by the examples of material culture of Mesolithic monuments, this period is the land of Uzbekistan. av. Covers XI-VII millennia. But in the classification of the world, the Middle Stone Age begins with 12 thousand years BC Below we have compiled a cultural periodic table of monuments of the Mesolithic period of Uzbekistan (table 1). According to him, it can be said that the territories of Uzbekistan have been occupied by primitive tribes since the early Mesolithic period. First of all, the north-eastern regions of our country, i.e. Fergana (Obishir culture) and Tashkent oases (Koshlish) were mastered. Later, from the middle of the Mesolithic period, the Zarafshan River valley Charboqti areas (Sazaghon 1) and Surkhandarya (Ayrtom, Old Termiz, Machay), Ustyurt and Kyzylkum regions were occupied.

Table 1. Periodic cultural table of Mesolithic monuments of Uzbekistan

№	Monuments	Dates	Cultures
1	Toshkumir	XI millennia	The first stage of Obishir culture
2	Obishir I-V (2 points, Madyor, Ashi-Kul, Yangi-Qadam 21, Zambar 2 and others)	VIII -VII millennia	Middle stage of Obishir culture
3	Central Ferghana Mesolithic (3, 5, 16 points, Sariq-Suv, Baxrobad and others)	7th millennium	The last stage of Obishir culture
4	Kushilish	X-IX millennia	Tashkent variant of Obishir culture
5	Ayritom, Termez materials	IX-VII millennia	Surkhandarya culture
6	Machai	7550±110 years	Surkhandarya culture
7	Sazagan 1 space	VIII -VII millennia	Sazaghon culture
8	Ochilgor space	IX-VII	
9	Ustyurt. Advanced Mesolithic: (Aydabola 16 and 25)	VIII-VII millennia	?
10	Ustyurt. Late Mesolithic and Early Neolithic: (Aidabol 2, 4, 7, 9, 10, 11, 20, 21, 22, 23, Aktobe 1,Churuk 3, Aktobe 2.	VII-VI millennia	?

Comprehensive paleogeographic and archaeological studies in the territories of Uzboy, Amu Darya, Zarafshan, Kyzylkum and the Central Asian Mesopotamia indicate that these territories were densely populated during the late Pleistocene and early Holocene. The discovered monuments in various ecological conditions indicate that there were favorable natural conditions for human existence. The Mesolithic tribes living in these territories lived in different natural conditions, continued their cultural development and laid the foundation for the further evolution of the Stone Age cultures.

Economy of the Mesolithic tribes. Of course, the importance of studying the Mesolithic monuments of Uzbekistan is great, or it gives us for the first time an idea about the types of economy, about the life of the Mesolithic tribes of Uzbekistan.

Man has made great strides in improving the tools of labor. Already in the Paleolithic, throwing spears - darts were invented. Then man acquired a bow and arrow, which was a huge achievement in the history of mankind. Now it was possible to hunt birds, small swift-footed animals that rarely fell prey to humans in the Paleolithic era.

The bow was essentially the first mechanism invented by man. In the Mesolithic era, the microlitization of guns reaches a height of. Different shapes of geometric tools appear. The era from the appearance of onions to the invention of ceramics covers the period from about the 10th to the 5th millennium BC. e. and is called the Mesolithic [7].

The animal world has also changed. Before that, hunting in mountainous areas, like the previous era, was roe deer, mountain goats and rams, and in the lowland areas - bison, gazelle, horses, hares. Hunting could not be a reliable source of food. This set before the person the task of finding new forms of economy, new means of subsistence. Following the change in the landscape and fauna, the way of life of the people of the Stone Age also changed [8].

According to the faunal remains, paleogeographic and functional data of the materials of the Obishir 1-5 site, representatives of this culture were hunters and gatherers. They hunted Siberian deer, argali, gazelle, deer, etc. animals. The main hunting weapon was a bow and arrow; individual arrows were found from the sites of Obishir and Central Fergana. Stone tools also indicate that hunting was the main business of the economy. In the economy of this culture, the processing of skins and the manufacture of various things from them played an important role. In the economy of representatives of this culture, leather processing played an important role. The existence of collecting is evidenced

by stone sickles and grain grinders found from the Mader locality. In general, representatives of the Obishir culture were engaged in wandering hunting in the foothill and desert zones [7].

According to the quantitative indicators of labor tools, it can be said that there were main long-term camps (Obishir 5, Sarik-Suv, etc.), short-term shelters (point 3, Ittak-Kala 1, etc.) and locations for cutting hunting prey (Ashi - Cool, Mader 11, 2 and point 16, Taipak 3).

To study the economic activity of the Mesolithic tribes of Central Asia, we use a number of sources. This information about the natural environment of the study area, about the visible and quantitative composition of the fauna, the nature of its distribution in the layer, the functional purpose of tools, etc.

Cattle breeding in their economy in this era did not yet exist or did not play a decisive role. The bones of small ruminants from domestic animals were found in the upper layer at Obishir 5 Cave and Machai Cave. The most famous are the presence of cattle bones in both layers of Machai Cave. Hence, it remains to accept that the inhabitants of the cave raised sheep, goats, and possibly cattle. At least there is reason to talk about the initial stage of the timing of large horned animals. Now it is difficult to decide with certainty the question of whether the territory of Uzbekistan will be found as an independent center for the development of cattle breeding or be part of the Central Asian cattle breeding center.

In the economy of the Mesolithic populations of Ustyurt, traceological data testify, and it is mainly of an appropriating nature. The main occupation of the population in this era was hunting and gathering. In the household, the main place was occupied by the processing of bones, wood and hides. The Mesolithic population of Ustyurt lived in cultural contacts with the cultures of adjacent territories and played an important role in the development of the subsequent Neolithic era.

On the basis of the achievements made by the Mesolithic tribes of the south, it became possible for their transition from gathering to the cultivation of cultivated plants - to agriculture and breeding of domestic animals. Equally naturally, in the course of time, the inhabitants of the steppes and mountain regions, probably with the help of their settled neighbors, switched from hunting wild animals to cattle breeding. The first farmers and pastoralists owe all this to their predecessors, the people of the Mesolithic time, in which the first cracks in the ancient consuming economy, which dominated for several million years, began, when the search for new sources of livelihood, new forms of life and culture. These first timid steps of the Mesolithic people prepared a great turning point - the transition to a productive economy, and with it many other progressive changes in all areas of culture and human life.

CONCLUSIONS

The results obtained from the study of Mesolithic sites in Uzbekistan align with and expand upon the existing body of research regarding the early Holocene human occupation of Central Asia. Similar to findings by Korobkova (1969, 1977, 1982), our analysis confirms that hunting and gathering were dominant subsistence strategies, with the bow and arrow playing a pivotal role in enhancing hunting efficiency. The identification of microlithic tools with diverse geometric shapes is consistent with broader Mesolithic technological trends observed across Eurasia [13-14].

The evidence of early animal domestication at sites like Machai Cave offers a valuable contribution to the ongoing debate on the origins and spread of pastoralism in Central Asia. While some scholars argue for an independent center of animal husbandry development in this region [8], our findings suggest that Mesolithic communities in Uzbekistan were likely involved in initial stages of domestication, possibly influenced by neighboring Neolithic cultures.

Furthermore, the settlement patterns identified-long-term camps, short-term shelters, and hunting stations—reflect a complex adaptation to diverse ecological zones, a pattern that resonates with Mesolithic adaptations documented in other parts of the world [10]. These findings emphasize the adaptive flexibility of Mesolithic populations, supporting the hypothesis that shifts in subsistence strategies were closely tied to environmental changes and resource availability.

Our study thus reinforces the significance of Mesolithic cultural innovations as precursors to Neolithic agricultural and pastoral economies. It also highlights the need for further interdisciplinary research combining archaeological, paleoenvironmental, and bioarchaeological data to deepen understanding of cultural transitions in Central Asia.

The conducted research on the Mesolithic monuments of Uzbekistan has allowed for a comprehensive understanding of the economic and cultural development of the Mesolithic tribes inhabiting Central Asia during the late Pleistocene and early Holocene. The study confirmed that hunting and gathering were the primary means of subsistence for these communities, with the bow and arrow serving as a key technological innovation that expanded hunting possibilities. Evidence from sites such as Obishir and Machai indicates the beginnings of animal domestication, marking a transitional phase from purely appropriating economies to early productive forms.

These findings significantly contribute to filling gaps in our knowledge about the evolution of human economies in Central Asia and the formation of later Neolithic cultures. The practical significance of this research lies in its potential to guide future archaeological investigations and conservation efforts of prehistoric sites in Uzbekistan and surrounding regions.

Prospective studies should focus on detailed paleoenvironmental reconstructions and the exploration of new Mesolithic sites, aiming to better understand the spatial-temporal dynamics of cultural development and the processes leading to the Neolithic revolution. Moreover, interdisciplinary approaches combining archaeological data with advanced methods such as ancient DNA analysis and isotopic studies could yield deeper insights into population movements, subsistence strategies, and cultural interactions in prehistoric Central Asia.

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