

SPATIAL ANALYSIS OF TURKIC BALBALS AND RUNE INSCRIPTIONS IN WESTERN MONGOLIA

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Abstract: *Scientists have established that the territory of western part of the Mongol Altai's five western provinces has been inhabited by humans since the Lower Paleolithic. However, the area, which has a rich historical and cultural heritage, is extremely poorly studied compared to central Mongolia, and research institutes lacked such opportunities. But in recent years, research has become more active. In this study, we tried to analyze the spatial distribution of the Tureg period manuscripts and Rune inscriptions in five western provinces by administrative units, natural zones, elevations, horizons, soil types, and protected areas, by total of 6 indicators.*

Keywords: *Rune inscription, Turkic balbal, Spatial analysis, Geographic information system.*

ПРОСТРАНСТВЕННЫЙ АНАЛИЗ ТЮРКСКИХ БАЛБАЛ И РУНИЧЕСКИХ НАДПИСЕЙ В ЗАПАДНОЙ МОНГОЛИИ

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Аннотация: *Учеными установлено, что западная часть пяти монгольских западных провинций была заселена уже в эпоху раннего палеолита. Однако, эта территория, имеющая богатое историческое и культурное наследие, весьма скудно изучена, по сравнению с Центральной Монголией, и исследовательские институты не используют эту возможность, хотя в последние годы процесс активизировался. В данном исследовании предпринимается попытка анализа пространственного распределения рукописей тюркского периода и рунических надписей в пяти западных провинциях в зависимости от административного деления, природных зон, типов возвышенностей и горизонтов, типов почв и защищенных территорий, всего по шести показателям.*

Ключевые слова: *рунические надписи, тюркские балбалы, пространственный анализ, геоинформационная система*

1. Introduction

In the age of globalization and the trend of over-consumption, the world's cultural heritage, including historical and cultural monuments, is

eroding over time, with the negative consequences of the scientific and technological revolution and the evolution of socio-economic life. As the threat of being destroyed threatens to escalate, countries must work together to protect it, both nationally and internationally, in accordance with national and international law prohibiting the «illegal import, export and transfer of cultural property» as well as the 1970 UNESCO Convention on the Prohibition and Prevention of the Transfer of Property, the 1972 UNESCO Convention for the Safeguarding of the World Cultural and Natural Heritage, and the 2001 UNESCO Universal Declaration on Cultural Diversity (<https://whc.unesco.org/en/conventiontext/>). The study of historical and archaeological sites in the western part of the Early Mongol Altai was insufficient compared to other regions. An expedition led by the Russian explorer G. P. Potanin first studied the historical and cultural monuments of the region in the late 19th century [3, 4].

Since then, in the 1950s and 1960s, our national archaeologists, including Dr. N. Ser-Odjav, have explored some soums in Bayan-Ulgii province and reported on a few monuments. In the 1960s and 1980s, the Stone Age Research Unit of the Mongolian-Soviet Joint Historical and Cultural Expedition, led by the Academy A. P. Okladnikov, D. Dorj, and A. P. Derevyanko, uncovered some ancient Stone Age monuments in the Khovd and Sagsain river basins and studied them [4].

Professor D. Tseveendorj, V. D. Kubarev and E. Jakobson studied petroglyphs in Baga Oigur-Tsagaan Salaa of Ulaankhus soum, Shiveet Khairkhan and Aral Tolgoi of Tsengel soum within the framework of the Mongolian-Russian joint project «Ancient Altay» in 1994–2005 [1]. The results have been published in 4 volumes and 6 books. Most of these studies have been in the form of circular explorations and petroglyphs, a few local deer statues, and human stones or balbals. There is a need for a modern study of these ancient monuments, as no comprehensive scientific study of them has ever been done before. Historical and cultural monuments include man-made tombs, mausoleums, burial mounds, monuments, petroglyphs, and temple ruins [9].

«Cultural heritage» means cultural heritage that has the value and significance of nature, society, history, culture, art, and science that can represent a particular historical space or time period. Cultural heritage is classified into tangible and intangible in its traditional form [8].

Intangible heritage is divided into movable and immovable. Traces of fossils of ancient animals and plants in tangible cultural heritage include ancient human dwellings, camps, and monuments that have preserved their traces of residence, places where minerals were mined and processed, ancient tombs, deer statues and human stone and light

monuments, archeological monuments such as petroglyphs and inscriptions. Movable monuments include museum exhibits, temples, and personal artifacts. Immovable monuments include archeological, paleontological, and architectural monuments, such as ancient steppe burial mounds, petroglyphs, inscriptions, and the ruins of ancient cities and temples. For this reason, the Tureg period human stone and Rune inscriptions are a cultural heritage.

1.1. Runic inscriptions monuments of the Tureg period

In recent years, a number of new runic inscriptions related to the ancient Turkic ethnic groups living in Mongolia have been discovered in the five western provinces. These inscriptions are not only important sources for the study of the history, language and culture of ancient Turkic, Uyghur and Kyrgyz countries, but also as historical sources. The inscriptions found in the territory of the five western provinces belong to the category of small monuments of Mongolian runic script and are a line script in terms of writing style and form [6].

The content of these inscriptions, which usually consist of one or two lines, shows that they have very little to do with burial and sacrificial rituals, but that they are mostly about life and hunting. There are currently more than 10 runic inscriptions in the five western provinces, and it is likely that they will continue to be found in the region [3].

1.2. Balbals of the Turkic period

One of the most common types of archeological monuments in Mongolia is the human stone statue. The first researcher of Mongol Altai's Human stone was a well-known Central Asian Scientist G. H. Potanin, who organized two reconnaissance units in Western Mongolia in 1876–1878. The work of this exploration class is still of great value to this day, as it has accumulated invaluable information not only in the ancient studies of the Western Mongolia, but also in history, ethnography, and geography [7].

The Institute of Mongol Altai Studies has been implementing the «Historical and Archaeological Monuments of the Western Altai of Mongolia» project since 2005. During the implementation of the project, archeological research in the region was deepened, and modern archeological research methods were used to classify the monuments by type, form, and time, and to study them in a comprehensive manner [9].

1.3. Legal environment

The laws and regulations issued by the government show that our country is taking a number of measures to preserve its cultural heritage [5]. These include:

Article 7.1 of the Constitution of Mongolia states that historical, cultural monuments, scientific and intellectual heritage of the Mongolian people are under state protection;

Law on Protection of Cultural Heritage renewed in 2014;

The State Enlightenment Supervision Service was established by the protocol No. 172 of the Government of Mongolia in 1998;

«National program for protection and restoration of immovable historical and cultural monuments» approved by the Government Protocol No. 51 of 1998;

Article 17.3 of the Law of Mongolia on Protection of Cultural Heritage classifies the legal protection of immovable historical and cultural monuments as state, local and organizational. It is stated that «the list of immovable historical and cultural monuments under state and local protection shall be determined by the Government based on the proposal of the state central administrative body in charge of culture and science».

2. Research methodology

This study was a combination of spatial and non-spatial data using ArcGIS 10.8 geographic information software to create spatial images with scale 1: 1000000 and 1: 1500000. This database will be connected to the geographic information system in the future and will open up a wide range of opportunities to process, study, monitor and protect information. Spatial information was used, such as Aster DEM, soil classification, administrative boundaries, natural zones, and protected area boundaries.

In this study, D. Tseveendorj, Ts. Turbat's non-spatial information, such as atlases, research reports, and printed sources, such as «Archaeological Monuments of the Mongol Altai», «Atlas of Cultural Heritage Risk» published in 2017, and «Historical and Cultural Monuments of Mongolia» (Thematic Directory) in 1999, were digitized and coordinated and analyzed in combination with spatial data [2].

Five western provinces of Mongolia, Bayan-Ulgii, Khovd, Uvs, Zavkhan and Gobi-Altai provinces were selected for the research.

Uvs province: The lowest point in Uvs province is the Uvs Lake Basin Strictly Protected Area, which is 758.9 meters above sea level, and the highest point is Tsagaan Deglii, which is 4,250 meters above sea level. It is located in the Great Lakes' pit and the Altai mountains, so it has a harsh continental climate. Summers are +40–50 degrees Celsius in July and winters are -40 degrees Celsius in January. The province center is Ulaangom, with 19 soums and 93 bags.

Bayan-Ulgii province: The territory of Bayan-Ulgii province is 1301–4374 meters above sea level, and 95.3 % of the total territory is located above 1600 meters. As for the temperate climate, the surrounding high mountains attract moisture from the outside air, so the average annual precipitation in the highlands of the Altai Mountains reaches 400–500 mm. The average annual wind speed is 4–9 m / sec. Bayan-Ulgii province has a total area of 45.8 thousand square kilometers with 13 soums.

Khovd province: Khovd province is located in the Great Mountains of Mongol Altai. There are large mountains such as Munkh Khairkhan, Khukh Serkh, Baatar Khairkhan and Myangan Ugalzat, and the Gobi steppe covers about 20 % of the province's territory. Pre-Cambrian bedrock and Quaternary sediments are distributed in the mountains. The high mountains are covered with rocks and soils in the foothills, the light brown soils of the steppe in the northern part of the country, and the gray soils of the Gobi in the southern part. In mountainous areas, alpine and mountain steppe vegetation grows, and in the southern part, Gobi vegetation. Khovd province is located in the western part of Mongolia and has 17 soums and 91 bags.

Zavkhan province: Zavkhan province is located in the western part of the Khangai mountain range, in the eastern part of the Great Mountain Depression, and in the northern part of the Mongol Altai mountain range. The territory of the province has decreased from east to west. Mr. Otgontenger, the highest peak in the Khangai Mountains, is 4031 meters high, and the lowest point is on the shores of Lake Durgun, at 1132 meters above sea level, 2000 meters above sea level. In the territory of the province, Mongolian sand in the direction of the Great Lakes, Bor Khyar sand in the middle part, about 50 percent of the total area from the west along the latitude, and scattered sand in the Tesiin river along the northern border. Zavkhan province is located in the western part of Mongolia and has 24 soums and 116 bags.

Gobi-Altai province: Gobi-Altai province is dominated by high mountain, dry steppe and desert Gobi steppe climate. The humid cold alpine and warm Gobi Desert climate is also formed in the semi-desert and high mountain peaks. There are high mountains such as Sutai, Burkhan Buudai, Alagkhaikhan, Ajbogd and Gichgene. Cenozoic sediments are also found in large pits such as Sharga, Biger, and Khuis, and the mountains are composed of Cambrian and pre-Cambrian bedrock. In the midland of Altai part there is a desert brown-gray soil, in the mountains there are mountain meadows and mountain brown soils, in the northern part there is brown soil, in the Front-Altai there are Gobi

vegetation, in the mountains there are mountain steppe and in the northern part there are steppe plants. Gobi-Altai province is located in the western part of Mongolia and has 18 soums and 87 bags.

3. Results

In the five western provinces, there are 10 Rune inscriptions and 290 Turkic period balbals, for a total of 300 monuments. Zavkhan province has 1 Rune inscription and 81 Turkic period balbals. Gobi-Altai province has 2 rune inscriptions and 17 Turkic period balbals. Bayan-Ulgii province has 3 Rune inscription and 56 Turkic period balbals. Khovd province has 1 Rune inscription and 60 Turkic period balbals. Uvs province has 2 Rune inscription and 77 Turkic period balbals. Table 1 shows the location of Rune inscriptions and Turkic period balbals by administrative unit. Zavkhan province has the largest number of 82 monuments by administrative location. As for the soum, there are 17 Turkic period balbals in Turgen soum of Uvs province (Figure 1).

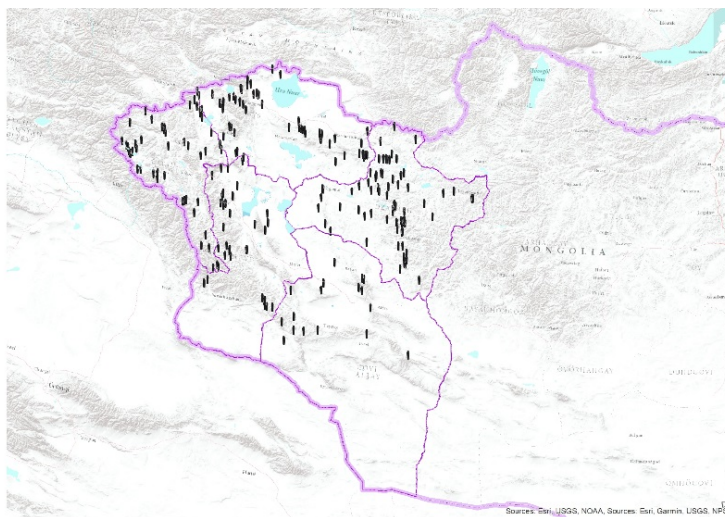


Figure 1. Marked sites of the monuments

Table 1

Number of monuments by administrative unit.

Pro-vice	Soum	Rune inscription	Turkic period balbals	Pro-vice	Soum	Rune inscription	Turkic period balbals	
Zavhan	Altar Khaan	0	4	Bayab-Olgii	Olgii	0	1	
	Bayan Tes	0	2		Altai	0	7	
	Bayar Kharkhan	0	7		Altantsogts	0	2	
	Dorvoljin	0	3		Bayannuur	0	3	
	Zavkhanmandal	0	2		Bugat	0	1	
	Ider	0	1		Bulgan	0	6	
	Ikh Uul	0	2		Deluun	0	6	
	Nomrog	0	1		Nogoonnuur	1	7	
	Santmargats	0	2		Sagsai	0	4	
	Sogino	0	6		Ulaankhus	1	6	
	Tosontsengel	0	1		Tsengel	1	13	
	Tudevtei	0	6		Khovd	Altai	1	1
	Telman	0	2			Bulgan	0	4
	Tes	1	1			Buyant	0	2
	Urgamal	0	3	Duut		0	2	
	Tsagaankhairkhan	0	7	Mankhan		0	3	
	Tsagaanchuluut	0	5	Munkhkhairkhan		0	13	
	Tsetsen-Uul	0	6	Myangad		0	4	
	Shiluustei	0	1	Hovd		0	12	
	Erdenekhairkhan	0	4	Tsetseg		0	9	
Yaruu	0	15	Chandman	0		4		
Uvs	Baruunturuun	0	2	Erdeneburen		0	6	
	Bohmoron	1	7	Govi-Altai		Bayan-Uul	0	1
	Davst	0	2			Biger	1	1
	Zuunkhangai	0	10			Bugat	0	2
	Malchin	0	9			Darwi	0	2
	Omno-Gobi	0	2			Jargalan	0	2
	Undurkhangai	0	1		Taishir	0	1	
	Sagil	1	5		Tonkhil	0	4	
	Tarialan	1	2		Togrog	0	1	
	Turgen	0	17		Khaliin	0	1	
	KHovd	0	5		Chandman	1	0	
	Khyrgas	0	10		Sharga	0	2	
	Tsagaankhairkhan	0	4					

The natural zone with the most monuments is the steppe with 89 monuments, and the zone with the fewest is real desert with only one monument. At an altitude of 1700–1945 meters, there are 27.9 % or 81 monuments of man-made stones of the Turkic period. In Tsengel sum of Bayan-Ulgii province, there is a rune inscription at the highest altitude of 3043 meters (Figure 2).

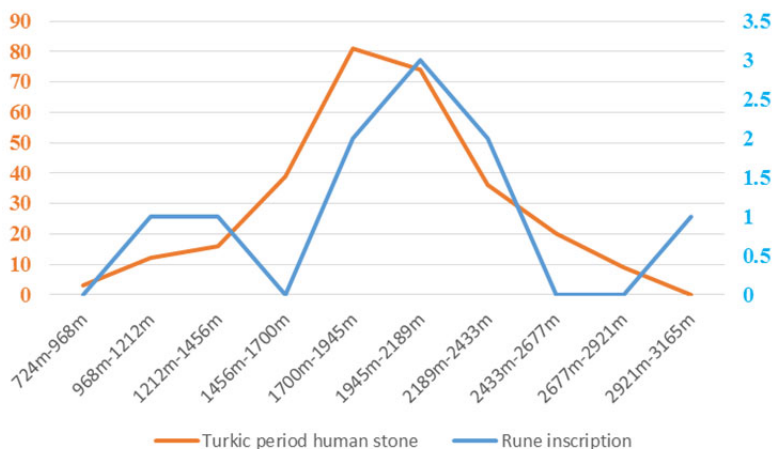


Figure 2. Altitude of monuments

From analyzing the direction, most of the Turkic period balbals face north and northeast, while a small number face east and west. Most of Rune inscription was facing northeast.

Table 2

Aspects of Monuments

Direction	Turkic period balbals	Rune inscription
North	65	2
North East	62	5
East	19	1
South East	33	0
Direction	Turkic period balbals	Rune inscription
South	41	1
South West	26	0
West	19	1
North West	25	0

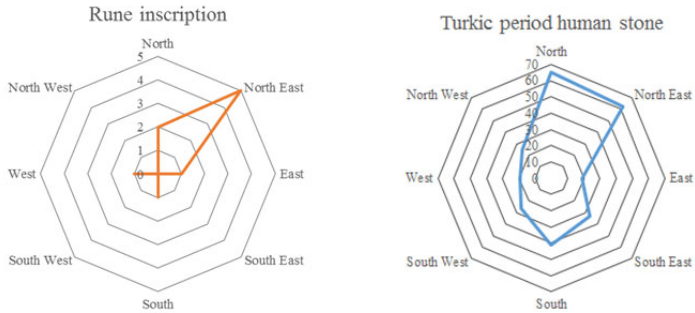


Figure 3. Aspects of monuments

Most of the Turkic period balbals were in mountain soil with it being 141 monuments, the number of monuments in other types of soils is in Table 4 and the lowest was in bare soil with only 4 monuments. Rune inscription were the found most in the mountain soils with 6 monuments, while the lowest was in mountain and hill soils with only 1 monument.

There are 2 Strictly Protected Areas and 9 National Parks in the study area, for a total of 53 monuments. There are 56 monuments in 31 places out of 256 local special use sites. There are total of 109 monuments in the state and local special use areas.

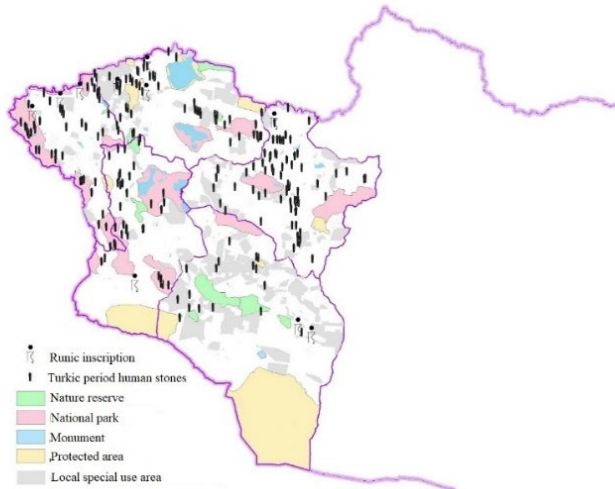


Figure 4. Special protected areas and monuments

4. Conclusion

The stone man are discovered not only in the territory of Mongolia, but also in our neighboring countries' border areas such as Tuva and Altai of Russia and Inner Mongolia and Xinjiang of China.

The spatial distribution of the Turkic period human stone and Rune inscriptions, which are part of the immovable cultural heritage, was analyzed by administrative units, natural zones, elevations, elevations, soil types, and protected areas, for a total of six indicators. Of the 88 soums in the five western provinces, 67 have Rune inscriptions and Turkic period balbals. From an elevation point of view, Rune inscriptions and Turkic period balbals were erected at relatively high altitudes and were usually placed on the north side.

One third of the total 109 monuments are in protected areas, and the rest are unprotected and more vulnerable to damage and looting. Therefore, these monuments should be taken into account and protected. Spatial analysis of other cultural real estate needs to be further collected.

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