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AGRICULTURAL CULTURE OF THE KARAKUYS SETTLEMENT: BASED ON ARCHAEOBOTANICAL MATERIALS OF THE EARLY IRON AGE

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Abstract. Introduction. This article considers the results of an archaeobotanical study conducted on plant macroremains found at the early Iron age Karakuys settlement, located in the territory of East Kazakhstan. **Purpose and Objectives.** The main objective of the research is to reconstruct the paleoeconomic structure and agricultural culture of the ancient tribes in the region, based on soft wheat (*Triticum aestivum*) grains discovered near the ash pits at the archaeological site. **Materials and Methods.** During field and laboratory investigations, the flotation method was applied to soil samples, and taxonomic and morphological analyses were performed on the obtained specimens. **Results.** As a result, alongside soft wheat, the remains of ribwort plantain (*Plantago lanceolata*) and hemp (*Cannabis*), which possess medicinal properties, were identified. These archaeobotanical data are directly corroborated by material evidence such as stone hoes, a small stone hammer, and banded and ornamented early Saka pottery rims found at the settlement site. While the discovery of stone hoes proves the tradition of purposeful land cultivation, the stone hammer and pottery artifacts indicate the processes of grain processing and storage. The obtained archaeobotanical data were comprehensively analyzed alongside paleoclimatic changes, medieval written sources, ethnographic data, and the ancient Turkic linguistic base. **Conclusion.** The conclusion of the study proves that the tribes of East Kazakhstan during the early Iron age were not exclusively engaged in nomadic pastoralism but also steadily practiced agriculture, and this tradition continued uninterrupted for centuries. The article makes a new scientific contribution to a comprehensive understanding of the ancient economic system of the region.

Keywords: East Kazakhstan, Karakuys, early iron age, archaeobotany, soft wheat (*Triticum aestivum*).

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ҚАРАҚУЫС ҚОНЫСЫНЫҢ ЕГІНШІЛІК МӘДЕНИЕТІ: ЕРТЕ ТЕМІР ДӘУІРІНІҢ АРХЕОБОТАНИКАЛЫҚ МАТЕРИАЛДАРЫ НЕГІЗІНДЕ

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Аңдатпа. *Kіріспе.* Бұл мақалада Шығыс Қазақстан аумағында орналасқан ерте темір дәуіріне жататын Қаракуыс қонысынан табылған өсімдік макроқалдықтарына жүргізілген археоботаникалық зерттеу нәтижелері қарастырылады. *Мақсаты мен міндеттері.* Зерттеудің негізгі мақсаты – археологиялық ескерткіштегі күлдіктердің маңынан табылған жұмсақ бидай (*Triticum aestivum*) дәндері негізінде аймақтағы ежелгі тайпалардың палеоэкономикалық құрылымы мен егіншілік мәдениетін қайта жаңғырту. *Материалдар мен әдістер.* Далалық және зертханалық ізденістер барысында топырақ сынамаларына флотация әдісі қолданылып, алынған үлгілерге таксономиялық және морфологиялық талдаулар жасалды. *Нәтижелері.* Нәтижесінде жұмсақ бидаймен қатар, емдік қасиеті бар қандауыр бақажапырақ (*Plantago lanceolata*) және кендір (*Cannabis*) қалдықтары анықталды. Бұл археоботаникалық деректер қоныс орнынан табылған тас кетпендер, ұсақ тас балға, сондай-ақ белдеулі және өрнекті ерте сақ қыш ернеулері сияқты заттай айғақтармен тікелей расталып отыр. Тас кетпендердің табылуы мақсатты түрде жер өңдеу дәстүрін дәлелдесе, тас балға мен қыш бұйымдар астықты өңдеу және сақтау процестерінен хабар береді. Алынған археоботаникалық деректер палеоклиматтық өзгерістермен, ортағасырлық жазба деректермен, этнографиялық мәліметтермен және көне түркі лингвистикалық базасымен кешенді түрде талданды. *Қорытынды.* Зерттеу қорытындысы ерте темір дәуіріндегі Шығыс Қазақстан тайпаларының тек көшпелі мал шаруашылығымен ғана емес, сонымен қатар егіншілікпен де тұрақты айналысқанын және бұл дәстүрдің ғасырлар бойы үзілмей жалғасқанын дәлелдейді. Мақала аймақтың ежелгі шаруашылық жүйесін кешенді түсінуге жаңа ғылыми үлес қосады.

Түйін сөздер: Шығыс Қазақстан, Қаракуыс, ерте темір дәуірі, археоботаника, жұмсақ бидай.

Алғыс білдіру: Зерттеу BR24992916 «Абай облысын кешенді тарихи-археологиялық зерттеу» жобасы шеңберінде жүргізілді.

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ЗЕМЛЕДЕЛЬЧЕСКАЯ КУЛЬТУРА ПОСЕЛЕНИЯ КАРАКУЫС: НА ОСНОВЕ АРХЕОБОТАНИЧЕСКИХ МАТЕРИАЛОВ ЭПОХИ РАННЕГО ЖЕЛЕЗА

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Аннотация. *Введение.* В данной статье рассматриваются результаты археоботанических исследований растительных макроостатков, обнаруженных на поселении Каракуйс эпохи раннего железного века, расположенном на территории Восточного Казахстана. *Цели и задачи.* Основная цель исследования – реконструкция палеоэкономической структуры и земледельческой культуры древних племен региона на основе зерен мягкой пшеницы (*Triticum aestivum*), найденных вблизи зольников археологического памятника. *Материалы и методы.* В ходе полевых и лабораторных изысканий к почвенным пробам был применен метод флотации, после чего полученные образцы подверглись таксономическому и морфологическому анализу. *Результаты.* В результате, наряду с мягкой пшеницей, были выявлены остатки подорожника ланцетного (*Plantago lanceolata*), обладающего лечебными свойствами, и конопли (*Cannabis*). Данные археоботанические сведения напрямую подтверждаются такими вещественными доказательствами, найденными на месте поселения, как каменные кетмени, небольшой каменный молот, а также фрагменты венчиков раннесакской керамики с валиками и орнаментом. Находка каменных кетменей доказывает традицию целенаправленного возделывания земли, в то время как каменный молот и керамические изделия свидетельствуют о процессах переработки и хранения зерна. Полученные археоботанические данные были комплексно проанализированы в сочетании с палеоклиматическими изменениями, средневековыми письменными источниками, этнографическими сведениями и древнетюркской лингвистической базой. *Заключение.* Выводы исследования доказывают, что племена Восточного Казахстана в эпоху раннего железного века занимались не только кочевым скотоводством, но и устойчивым земледелием, и эта традиция непрерывно продолжалась на протяжении веков. Статья вносит новый научный вклад в комплексное понимание древней хозяйственной системы региона.

Ключевые слова: Восточный Казахстан, Каракуйс, ранний железный век, археоботаника, мягкая пшеница.

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Introduction. In the study of the life support systems and economic characteristics of ancient societies, archaeobotanical data play a crucial role alongside traditional artifacts (pottery, tools). In this regard, the soft wheat grains found near the ash pit at the early Iron age Karakuys settlement represent unique evidence that allows for a new perspective on the economic structure, including the agricultural culture, of the ancient tribes in the region.

Currently, the study of such plant remains found in archaeological excavations is carried out by a multidisciplinary branch of archaeology – archaeobotany (or paleoethnobotany). Depending on the size of the studied remains (with a boundary of 0.1 mm or 100 µm), this discipline divides them into microremains (pollen, spores, phytoliths) and macroremains. Macroremains such as grains, seeds, and fruits, which are the subject of our study, directly indicate how ancient people utilized plants [Lebedeva, 2016].

As the practice of archaeobotanical research shows, relying solely on isolated finds is insufficient to fully reconstruct the ancient economy and agricultural culture. This is because even materials found in very similar settlements can be interpreted differently from a scientific perspective, sometimes even in contradictory ways [Lebedeva, 2009]. Therefore, to approach historical reality as closely as possible, the discovered plant remains must invariably be considered in a comprehensive manner alongside other characteristics of the monument.

In this regard, the main key to the correct interpretation of the obtained results is the archaeological context. It encompasses not only the specific location of the found sample (for example, near a hearth or ash pit) but also the functional status of the monument as a whole.

Based on these methodological foundations, the main objective of this article is to conduct an archaeobotanical analysis of the soft wheat (*Triticum aestivum*) grains found at the Karakuys settlement. Through this research, it is intended to determine the paleoeconomic structure of the early Iron age tribes, including their agricultural orientation and their place within the regional economic system.

Materials. The Karakuys settlement is located in the territory of the Kokentau rural district, Zhanasemey district, Abai region. It is situated 19.6 km in the north-north-east direction from the village of Kokentau, 1.8 km south of the Unay wintering ground, on the northern slope of the Karakus mountain system (Fig. 1).



Fig. 1. The geographical location of the Karakuys settlement

A steppe road connecting the Unay and Karasay wintering grounds passes 0.2 km from the northeastern side of the settlement. The monument is surrounded by mountains on three sides, with only the northern side open. The site consists of 4 stone structures located on a slight elevation among the mountains. The area covers 8000 square meters.

The chronological period of the monument is the early Iron age and the XIX–XX centuries, the ethnographic period.

The structure from the early Iron age covers the northwestern part of the monument. Its designation is no. 1. The stones of the object are barely visible from beneath the turf layer. Viewed from above, it has an oval-rectangular shape. The stones are scattered. Above the turf layer in the northern part of the object, 8 stone tools were found. The vast majority are hoe-like stone tools.

Object no. 2 is located 5 m south of object no. 1. Object no. 1 is a dwelling site from the early Iron age, while object no. 2 is an additional structure attached to object no. 1. Viewed from above, it is rectangular. Its dimensions are 15x11.30 m. The height is 0.25–0.35 m. It is built from medium-sized flat stones. It consists of 6 rooms. 50 m southeast of structure no. 2 is structure no. 3. It has an elongated oval shape. The remains of an ash pit are noticeable on the eastern side. The height of the structure is 0.2–0.4 m. It is built from large stones. It consists of five rooms. Dimensions are 14.50x18.30 m. Structure no. 4 occupies the southern part of the monument. It is located 32 m south-south-west of structure no. 3. It has a rectangular shape. It consists of 4 rooms. Dimensions are 14.30x17.20 m.

In accordance with the research methodology, 11 squares measuring 4x4 m were laid out over structure no. 1. The total excavation area was 176 m² (Fig. 2). The north-south direction was designated with Roman numerals, and the west-east direction with letters.

First, at the beginning of the excavation, the surface of the object was cleared of excess debris and grass. To observe the stone structure located at the object, the turf layer was completely removed. The depth of the turf layer was 7–12 centimetres. The thickness of the turf is very thin. During the clearing of the turf layer, neither pottery fragments nor animal bones were found at all. Only stone tools were discovered. This is due to the thinness of the turf layer and the strong flow of mountain water. The stone tools found before the excavation are artifacts washed out by meltwater. After removing the turf layer, some parts of the structure's walls were identified during the clearing process. They are barely noticeable among the scattered stones. Beneath the turf layer, greyish soil mixed with sand was found. The thickness of the cultural layer is 0.15–0.25 m. The lower part borders the sterile soil (subsoil). The color of the sterile soil is pinkish-grey. All material finds were encountered in this cultural layer.



Fig. 2. General view of the Karakuys settlement

During the excavation, pottery fragments were found in the area of square A3. The pottery sherds are greyish in color, with no distinct outstanding features observed. Based on the rim fragments and preliminary observation, a resemblance to early Saka pottery can be noted. A larger amount of animal bones was identified at the sterile soil level of square B3. A sherd with a banded applique, typical of the dongal period, was found in the area of square B2. The quantity is 1 piece. The vast majority of the pottery fragments belong to the body of the vessels. Rims are very few. All the decorated pottery fragments found feature «pearl» (bossed) ornamentation. During the identification of the morphological features of the rims, it was established that they were made with inner and outer cornices, in rounded and flattened shapes.

The total number of stone tools found is 59 pieces. Most of the stone tools were identified while clearing the sterile soil. They belong to the type of hoe-like stone tools. The vast majority of the stones were found in the turf layer. A total of 9 stone tools were identified from the turf layer in square V1. From the turf layer level of square B3, 8 stone tools were identified. Almost all of them were found in the central part of the square. During further excavation works, 8 stone tools were found at the turf layer level of square G2 (Fig. 3).



Fig. 3. Small stone hammers

After the complete structural site was opened, a structure with an ash-mixed layer was found in the northeastern part of the excavation, namely in the eastern half of square G1. The western part of the oval-shaped structure enters the excavation area. The remaining eastern part lies outside the excavation limits. The interior of the structure is completely filled with ash.

To further determine the number of structures, the balk was removed. After complete clearing works, the walls of the rooms were identified. The overall dimensions of the structure within the excavation are 7 m from south to north, while the length of the structure from west to east is 20 m. There are a total of 5 structures in the settlement. While removing excess scattered stones, a total of 6 structures were found.

Structure no. 1 is located in squares A3-B3. The width of the northern wall is 0.8 m, the western wall is 0.7 m; an entrance is made in the southwestern part. The shape of structure no. 1 is elongated-oval. The length of the entrance is 0.9 m. Structure no. 2 adjoins the eastern part of structure no. 1. It is located in square B3. Its length from north to south is 2.20 m, and from west to east is 2.90 m. Viewed from above, the structure has a square-oval shape. The thickness of its northern wall is 0.6 m, the eastern wall is 0.4 m, and the southern wall equals 0.7 m. The stones of the structure are laid flat.

Structure no. 3: length from west to east is 4.10 m, from south to north is 2.50 m. The northern wall of the structure is 1.70 m, the southern wall is 2.50 m, and the western wall is 1.80 m. The stones of the room's structure are placed vertically on the sterile soil. It occupies the areas of squares V2 and V3. The door faces east. It connects with an elongated corridor. The corridor has an elongated rectangular shape. Its length is 2.35 m, width is 0.8–0.95 m.

Structure no. 4 is located in square G3. Its length from west to east is 1.95 m, and from south to north is 3.7 m. The door faces east. The width is 0.35 m.

Structure no. 5 is located in the area of square V1. It borders the thick northern wall of structure no. 3. Its length from west to east is 2.70 m, from south to north is 3 m, and depth is 0.6 m. A specific feature of this structure is that it lies deep below the sterile soil level. The room was built by excavating into the sterile soil. The width of its outer walls is 1 m. The stones of the structure's wall were attached to the main structure no. 3 individually at a later time. The door is built from the east.

Structure no. 6 is located in square G1. Only half of the structure entered the excavation area. It is an oval-shaped structure stretching in the south-west-north-east direction. The stones of the structure's wall were originally installed vertically. The inside is filled with ash-mixed soil (Fig. 4). The inner floor lies at a depth of 5–8 cm from the sterile soil. The stones of the preserved wall stand vertically. They are slightly tilted outward.

The preservation of the structure walls that entered the excavation area is at an average level. The wall stones were dismantled for the construction of a Kazakh wintering ground. Due to the thinness of the turf layer, only the lower parts of the wall stones have been preserved.



Fig. 4. Structure filled with ash-mixed soil in square G1

Wheat. Wheat (*Triticum* spp.) is one of the cultivated cereal crops that holds a special place in the formation and development of human civilization. Wheat is an annual plant belonging to the grass family. There are two main types. The first is soft wheat (*Triticum aestivum*). Soft wheat is suitable for baking bread. The second is hard wheat (*Triticum durum*). Hard wheat is used for products like macaroni and noodles. Having exceptionally high strategic importance biologically, ecologically, and culturally, wheat has a vegetation period of 80–120 days. Wheat grown in black, brown, and moist soils yields an abundant harvest [Sosnin, 1954].

Among cereal crops, mainly spring (sown in spring) crops were cultivated. Several varieties of wheat were used; in particular, varieties known as «local» were widespread in the south and southeast of Kazakhstan. The most famous of these varieties were the white-colored «aq biday» (white wheat) and the red-colored «qyzyl biday» (red wheat). «Qyzyl biday» was distinguished by its long stem, the greenish tip of its spike, and its long, thin grain, and it was sown as both a winter and a spring crop. In contrast, «aq biday» was grown exclusively as a spring crop. Although «qyzyl biday» provided an abundant yield, the quality of the flour obtained from it was lower compared to «aq biday». Furthermore, «aq biday» was notable for its drought resistance and was widely sown primarily in non-irrigated fields [Shahanova, 1988].

Spring wheat is a moisture-loving crop. It requires the greatest amount of moisture and nutrients during the period between tillering and heading, as well as during grain filling. During this period, the presence of moisture and plant-available nutrients in the soil is a decisive condition for obtaining an abundant harvest [Sosnin, 1954].

Spring wheat, like winter wheat, is a staple food crop. The grains of spring wheat surpass those of winter wheat in terms of flour and baking qualities, as they are rich in protein, and protein enhances the nutritional value and quality of bread. Protein is particularly abundant in hard-grained wheats [Sosnin, 1954].

Written Sources on Wheat Cultivation in the East Kazakhstan Region. Al-Idrisi noted that the Kimaks, who inhabited the valley of the Irtysh River, grew wheat and barley, and cultivated rice and grapes [Kumekov, 1972; Shakhanova, 1988].

According to I.G. Andreev's data, in the settlements near the Chingistau mountains, in the Aknaiman volost along the Ayagoz River, and between the Bokan and Shegenek rivers, Kazakhs «engage in agriculture, sowing wheat, barley, and millet in sufficient quantities...» [Andreev, 1795; Andreev, 1796].

Furthermore, I.G. Andreev mentioned that all Kazakhs roaming across the Tarbagatai mountains «sow wheat and millet...» [Andreev, 1796; Shakhanova, 1988].

The East Kazakhstan region was one of the agricultural zones. Regarding this, A. Levshin writes: «... there are many valleys suitable for agriculture in this region, clean, healing spring waters, picturesque meadow grasses, and forests» [Levshin, 1832]. During this exact period, there are eyewitness accounts of Kazakhs sowing wheat near the city of Semey and across the Irtysh River [Nedorezov, 1827; Shakhanova, 1988].

A. Yanushkevich's data also indicates the widespread nature of agriculture: «Since the Kokpekty district is suitable for land cultivation, the majority of Kazakhs engage in farming and harvest abundant wheat...» [Yanushkevich, 1966].

In the ancient Turkic language, the names of cereal crops, their types, and foods made from them are recorded: *āšliq* – cereal crops, grain, bread; *avūn* – grain; *bašāq* – ear/spike; *benak* – small grain; *češni* – grains; *boγuz* – bread in the form of grain; *buydaj* (=budaj) – wheat; *buydaj baši* – ear of wheat; *uruy* – grain, seed, seeds; *uruyluq buydaj* – seed (Kamoliddin, 2015); *ašliq* – grain, cereal crops, food, bread; *avzuri* – a dish prepared from a mixture of wheat and barley flour or other flours; *burğul* / *burğun* – a dish prepared from pounded wheat; *buysi* – a dish prepared from wheat, almonds, and sweet spices; *jarma* – groats, pounded wheat, wheat dish; *laqs* / *laqsa* – wheat flour; noodles; *qaruq* – porridge made from barley or wheat; *qavurmaç* / *qoğurmaç* – a wheat dish prepared by frying in oil; *qavut* – porridge made from barley or wheat; *top* – a dish prepared from wheat and oat flour; *topun* – wheat bran [Kamoliddin, 2015].

Research methods. Field research. Archaeobotanical analysis was conducted on 2 samples from the Karakuys settlement. The samples were selected from squares V-3 and G-1. All samples taken for the study were collected near the hearth. The flotation method was applied to a 80-liter soil sample. First, water was poured into a bucket, and the soil taken for the study was added in a ratio of 1/4 or 1/3. The soil was carefully stirred until it was completely broken down. Within a few minutes, light organic matter floated to the surface of the water, and they were filtered out using a sieve lined with a special cloth. Thus, several charred (carbonized) organic samples were collected. The top of the cloth was tied off, and the samples were dried. Laboratory research was conducted on the dried samples [Lebedeva, 2009; Sergusheva, 2013].

Laboratory research. Laboratory studies of the archaeobotanical samples were carried out at the Research Institute of Cultural Heritage of the National Museum of the Republic of Kazakhstan. Based on the degree of preservation, the samples were divided into two groups: intact and fragmented, and taxonomic identifications were performed using a microscope. Through taxonomic research, the samples were identified down to the family, genus, and species levels. For this purpose, various atlases used in archaeobotany were utilized [Artyushenko, 1990; Neef et al., 2012]. Additionally, morphological features such as shape, size, surface structure, etc., were described.

Results and discussion. In archaeobotanical studies, the primary object of research is the study of charred grains and seeds, which are well-preserved for thousands of years. Charred grains and seeds are found in crop drying areas where the harvest was gathered, in pits where household waste was discarded, near hearths, and in places where fires occurred. From the soil samples taken for research near the hearth, soft wheat (*Triticum aestivum*), ribwort plantain (*Plantago lanceolata*), and hemp (*Cannabis*) were identified [Table 1].

Among the cultivated crops, only 4 specimens of soft wheat (*Triticum aestivum*) were found (Fig. 5). 2 are intact, and 2 have slightly broken tips. Dimensions are 3–4 x 5–6 mm. To determine the dating of the soft wheat (*Triticum aestivum*), one specimen was sent to a research center in Vilnius. The stem of soft wheat is hollow inside, and its grain is soft and convenient for milling into flour.

The remaining two discovered types belong to wild plants. 3 specimens of ribwort plantain (*Plantago lanceolata*) and 30 specimens of hemp (*Cannabis*) were recorded. The dimensions of the ribwort plantain (*Plantago lanceolata*) are 1.5–2 x 5–6 mm. The dimensions of the hemp (*Cannabis*) are 1.3–1.5 x 3–4 mm. These two aforementioned wild plants possessed medicinal properties.

Taxonomically, soft wheat belongs to the genus Wheat (*Triticum*) and the family Grasses (*Poaceae*); ribwort plantain belongs to the genus *Plantago* and the family *Plantaginaceae*; and hemp belongs to the genus *Cannabis* and the family *Cannabaceae* [Table 2].

Table 1. Archaeobotanical samples of the Karakuys settlement

No.	Name	Total quantity	Dimensions	Period
1	Soft wheat (<i>Triticum aestivum</i>)	4	3–4 x 5–6 mm	EIA
2	Ribwort plantain (<i>Plantago lanceolata</i>)	3	1.5–2 x 5–6 mm	
3	Hemp (<i>Cannabis</i>)	30	1.3–1.5 x 3–4 mm	

Note: Compiled by the author.

Table 2. Taxonomic analysis of archaeobotanical samples found at the Karakuys settlement

Taxonomic analysis	No. 1	No. 2	No. 3
Kingdom	Plants (Plantae)	Plants (Plantae)	Plants (Plantae)
Family	Grasses (Poaceae)	Plantains (Plantaginaceae)	Hemp family (Cannabaceae)
Genus	Wheat (<i>Triticum</i>)	Plantain (<i>Plantago</i>)	Hemp (<i>Cannabis</i>)
Species	Soft wheat (<i>Triticum aestivum</i>)	Ribwort plantain (<i>Plantago lanceolata</i>)	Hemp (<i>Cannabis sativa</i>)

Note: Compiled by the author.

**Fig. 5.** Wheat found at the Karakuys settlement

It is widely known in science that wheat and barley spread from Western Asia, while rice and millet spread from Eastern Asia [Zohary et al., 2012], subsequently converging in Central Asia [Jones et al., 2011; Liu et al., 2017]. Given the evidence of the cultivation of several wheat species, particularly emmer and soft wheat, in the southern and mountainous regions of Central Asia [Moore et al., 1994], the discovery of wheat remains on the territory of Kazakhstan is not coincidental.

Among the earliest cereal crops found in the country are the millet and wheat from the Begash settlement in southeastern Kazakhstan. The cultivated crops discovered at this site, which belongs to the III millennium BC, are dated to 2460–2150 BC [Frachetti et al., 2010; Spengler et al., 2013; Spengler et al., 2014a; Motuzaite Matuzeviciute et al., 2019]. The second most important settlement in this region is Tasbas. Although wheat grains are not abundantly preserved here (dated to 2840–2500 BC), barley, millet, and leguminous crops dating to 1450–1250 BC have been identified (Spengler et al., 2014a). Additionally, it is worth noting that towards the end of the II millennium BC, microremains of domesticated plants were thoroughly studied at the Kyzylbulak and Merki sites in Zhetyysay [Chang et al., 2003; Doumani et al., 2015; Rosen, 2001; Rosen et al., 2000; Spengler et al., 2014b; Spengler et al., 2014c]. Charred wheat remains found near the Alekseev site in Northern Kazakhstan were also initially dated to the middle bronze age, and subsequently to the early iron age [Krivosova-Grakova, 1948; Shishlina et al., 2018].

This agricultural tradition, originating in the bronze age, continued further during the iron age. The discovery of millet, barley, and wheat remains at the iron age (ca. 700 BC) sites of Tuzusai and Tseganka 8 in southeastern Kazakhstan serves as clear evidence of this [Chang et al., 2003; Lightfoot et al., 2015; Rosen et al., 2000]. In this regard, the discovery of soft wheat (*Triticum aestivum*) grains near the ash pits at the early iron age Karakuys settlement in the East Kazakhstan region is a significant addition to paleoethnobotanical studies. This finding demonstrates that the distribution area of cereal crops during the early Iron age was not confined solely to the southern or northern regions, but also encompassed the eastern territories.

The farming practices established in early periods reached their zenith during the Middle ages. Archaeological, written, and paleobotanical sources indicate that South Kazakhstan was a major agricultural region between the IV and XIV centuries [Bashtannik, 2007a]. In the cultural layers of the Talgar settlement dating to the VIII–IX centuries, alongside imported rice husks, phytoliths of locally grown barley, millet, and oats were found, as well as the charred remains of two-row hulled barley, common millet, and a dwarf variety of soft wheat [Golyeva, 2008; Bashtannik, 2002]. This agricultural tradition is entirely corroborated by carpological data (fruits, berries, barley, millet, and rarely wheat) obtained from medieval settlements such as Antonovka, Ornek, Akyrta, Kuiryk-tobe, Konyr-tobe, Zhuan-tobe, and Karaspan-tobe [Bashtannik, 2002; 2007b; 2008]. Furthermore, the remains of multiple varieties of wheat, barley, and millet, as well as legumes and fruits (grapes, melons) found in the citadel of the city of Taraz in southwestern Zhetysu, reflect the high level and diversity of agriculture during that period [Bashtannik et al., 2015].

The new archaeobotanical data obtained from the Karakuys settlement reconfirms the existence of a complex agricultural system on the territory of Kazakhstan that developed continuously from antiquity to the Middle ages, integrating the agricultural traditions of both East and West.

Conclusion. Comprehensive archaeobotanical and material studies conducted at the Karakuys settlement have allowed for new scientific conclusions regarding the economic system of the early Iron age tribes in the territory of East Kazakhstan.

Firstly, the macroremains of soft wheat (*Triticum aestivum*), ribwort plantain (*Plantago lanceolata*), and hemp (*Cannabis*) found near the hearth in the settlement serve as irrefutable material evidence of ancient agriculture in this region and the purposeful use of plants in everyday life (for food and medicinal purposes). These natural data are fully corroborated by the complex of tools and household items excavated from the settlement site. Specifically, while the discovery of stone hoes proves the process of purposeful land cultivation, the small stone hammer and the early Saka pottery rims with banded and ornamented designs indicate the established practice of grinding, processing, and storing grain. In particular, the simultaneous discovery of soft wheat, considered a cultivated crop, and specialized agricultural tools provides concrete proof that the grain-growing area during the early Iron age was not limited only to the Southern or Zhetysu regions, but completely encompassed the territory of East Kazakhstan as well.

Secondly, the ecological changes caused by the climate transition from the late subboreal period to the early subatlantic period (cooling and humidification) in the I millennium BC pushed ancient tribes toward new survival strategies. As a result, a complex (mixed) paleoeconomic model, combining animal husbandry and agriculture, was formed in the favorable recreational-climatic zones of East Kazakhstan (comfort and subcomfort zones).

Thirdly, it is highly significant that the paleoethnobotanical data obtained from the Karakuys settlement fully resonate with medieval written sources, ethnographic data of the XVIII–XIX centuries, and the ancient Turkic linguistic base. This fact demonstrates that the agricultural culture in East Kazakhstan was not an accidental phenomenon introduced from the outside, but rather a fundamental economic tradition originating in the Bronze and early Iron ages and continuing uninterrupted until ethnographic times.

In conclusion, the archaeobotanical materials and agricultural tools of the Karakuys settlement refute the traditional, unilateral view that ancient nomads were engaged exclusively in animal husbandry. They highlight that these societies effectively exploited natural resources, mastered complex agrarian skills, and formed their own sustainable life-support system.

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