European Journal of Archaeology 28 (4) 2025, 423–440

Growing, Storing, and Processing Cereals in the Inkerman Valley in Crimea at the Turn of the Bronze Age to the Iron Age

Evelina A. Kravchenko

Institute of Archaeology, National Academy of Science of Ukraine, Kyiv, Ukraine
Email: evekravchenko@gmail.com

This article concerns the economy of one of the few fortified settlements of the Late Bronze Age–Early Iron Age on the northern coast of the Black Sea, the Uch-Bash settlement, and its satellite settlement, Sakharna Holovka, in the Inkerman Valley in south-western Crimea. Archaeological excavations from the 1950s onwards have yielded much information on the cultivation of plants from the settlement, including charred grains and their impressions on pottery, tools for harvesting and processing the crops, storage containers, and other objects. Data were also obtained on the crops that were grown in the Inkerman Valley. Together, this evidence shows that the production of cereals was a major aspect of its economy at the turn of the Bronze Age to the Iron Age.

Keywords: Late Bronze Age, Early Iron Age, agriculture, Crimea, Uch-Bash

Introduction

The Uch-Bash settlement is located on a secluded rocky outcrop in the upper reaches of the Sevastopol Bay on the right bank of the river Chorna in south-western Crimea (Figure 1: 1). It is one of the few fortified large settlements of the Final Bronze Age in the northern Black Sea region. Their emergence during the Final Bronze Age in the upper reaches of navigable bays and estuaries in this region is owed to a coordinated system. This heralded a new stage in the history of the region and laid the foundations for the beginning of the Iron Age (Kravchenko, 2023a). The palaeobotanical and artefactual assemblages recovered at the Uch-Bash settlement and the contemporaneous satellite settlement of Sakharna Holovka (Figure 1: 2) make it possible to identify a number of innovations in the economy of the people who founded and occupied these settlements and developed the Inkerman Valley. Some of the most important innovations are metalworking, iron metallurgy, and cereal cultivation. During the Final Bronze Age to Early Iron Age in the northern Black Sea region, the presence of large quantities of cereal grains and their impressions on ceramics at Uch-Bash and Sakharna Holovka are of special significance, throwing light on the economy of the people who lived there, given that finds of grain are scarce in the region.

doi:10.1017/eaa.2025.10014
Manuscript received 10 May 2023,
accepted 20 June 2025, revised 21 January 2025

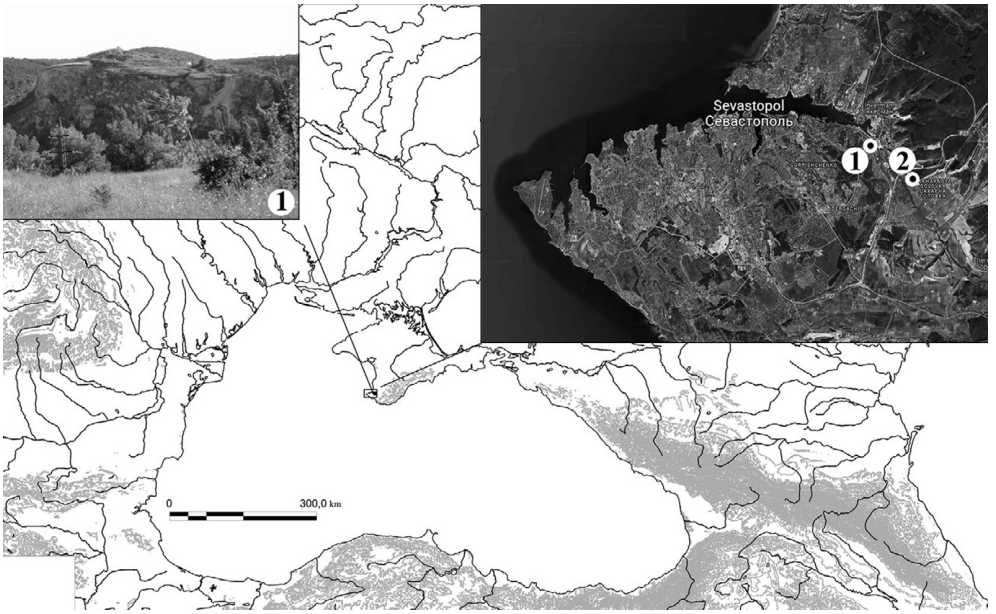

Figure 1. *The settlements of Uch-Bash (1) and Sakharna Holovka (2) in the Pontic region.*

Archaeological Context

In previous studies (e.g. Kravchenko, 2007, 2009, 2010b, 2011), we paid particular attention to the chronology of various features, areas, and layers of the Uch-Bash settlement. Five chronological horizons, i.e. narrow time intervals characterized by a specific traits of material culture, everyday life, or economy, were identified. Based on recurring elements in the ceramic assemblage, the horizons were combined into periods that correspond to the historical periods in the region. The five horizons (I–V) identified at Uch-Bash were combined into three periods: the Older Pre-Taurian, the Younger Pre-Taurian, and the Taurian (named after the tribe recorded in historic accounts of the area). These periods are synchronized with the corresponding cultural periods of the northern Black Sea region, as presented in Table 1. Traditionally the Uch-Bash settlement is attributed to the Crimean Kyzyl-Koba archaeological culture, without further correction or clarification. We do not think that the early sites of the Kyzyl-Koba culture and the sites of the Greek colonization period of the northern Black Sea region belonged to the same ethnic group or tribes. (Kravchenko, 2007, 2020). Therefore, we refer to the first two periods as Pre-Taurian (Early and Late), and the third as Taurian, indicating its association with the Taurian tribes (Kolotukhin, 1996; Kravchenko, 2011).

In terms of absolute dates, the settlement was founded at the end of the twelfth century BC and occupation ended in the eighth–seventh centuries BC. This is one of the few settlements in the northern Pontic region that continued to exist after the decline of the Late Bronze Age Bilozerka culture in Ukraine and Moldova, remaining active during the so-called Cimmerian stage (from the turn of the tenth/ninth centuries BC to the late eighth or early seventh centuries BC), specifically the Chornohorivka period (from the turn of the tenth/ninth centuries BC to the mid of the eighth century BC).

https://doi.org/10.1017/eaa.2025.10014 Published online by Cambridge University Press

Table 1. *Chronology and synchronization of Inkerman Valley sites and complexes of the Kyzyl-Koba culture.*

Periods of Kyzyl-Koba culture	Horizons of Kyzyl-Koba culture	Pontic Steppe	Lower Danube	Central Europe	Aegean Sea	Northern Caucasus
		Bilozerka culture	Babadag I	HaA (late)	Troy VIIb2	
Early Pre-Taurian period	**I-UB** (2nd half 11th–10th c. BC)			HaB1		
	II-UB (mid-10th–end 10th c. BC)		Babadag I/II	HaB2		
	III-UB (end 10th–1st half 9th c. BC)	Chornogorivka stage (Cimmerian culture)	Babadag II	HaB2/3–		Sergen`-Yurt III
Late Pre-Taurian period	**IV-UB** (2nd half 9th–1st half 8th c. BC)		Babadag III	HaC (early) HaC1		Tli Pshysh, Fars
Taurian period	**Ia-UB, V-UB** (2nd half 8th–beg. 7th c. BC)	Novocherkaska type, Zolne, L`govs`ke, pre-Kelermes, Early Kelermes type		HaC2		Kelermes, Mozdok, Zmeevska cemetery
	VI-H (7th–1st half 6th c. BC)	Scythian culture	Geto-Dacian antiquities		Greek ceramic imports: 550 BC	
	VII-K (mid–6th–end 5th c. BC)					
	VIII-K (end 5th–mid–4th c. BC)					
	IX-K (2nd half 4th–3rd c. BC)	Late Scythian culture			300–275 BC	

It declined only after the invasion of the so-called Novocherkassians (middle of the eighth century BC) or during the Early Scythian period (probably in the early seventh century BC). All archaeological material analysed in this article has its own strict context, i.e. connecting with specific layers or features, as shown in the tables. The contexts and features were examined in detail in previous publications (Kravchenko, 2011). Economic issues were also raised, but a comprehensive study devoted to agronomy and grain farming has not been presented by previous researchers (Strzheletskiy, 1951a, 1951b) or in our syntheses. This article is the first contribution to further research on the economy of the region of the Final Bronze and Early Iron Ages, allowing its conclusions to pave the way for further work outlining the directions of historical processes in Eastern Europe.

Our goals were the following: to analyse the palaeobotanical remains from the Uch-Bash settlement associated with the cultivation, storage, and processing of crops; identify similarities and differences in features at horizon level; correlate palaeobotanical and archaeological data; recognize patterns and differences in feature complexes; and combine the findings of our analysis of the Uch-Bash data with the chronology and conclusions on Uch-Bash's economy that we had reached in previous work. It should also be noted that no special studies have been conducted to analyse agriculture in the Crimea and most other adjacent regions at the transition from the Bronze Age to the Iron Age. This is mainly due to a lack of evidence. In this regard,

https://doi.org/10.1017/eaa.2025.10014 Published online by Cambridge University Press

Uch-Bash provides a unique collection of finds that can contribute to further long-term research.

Archaeobotanical Context

The archaeobotanical data from Uch-Bash come from research conducted in the early 1950s, headed by Stanislav Frantsevich Strzheletskiy (Strzheletskiy, 1952, 1953). At that time, several thousand grains were obtained by sieving material from the pits and buildings of Uch-Bash, which were identified by specialists of the Nikita Botanical Garden in Crimea. The results were collated in a field reports (Strzheletskiy, 1952, 1953), and the grains were kept at the Nikita Botanical Garden (Table 2). The excavation reports (Strzheletskiy, 1952, 1953) indicate that charred grains were present in such quantities in the household refuse pits that they could be seen without specialist equipment. The soil from the pits was drily sieved through specially made screens with different mesh sizes (Strzheletskiy calls them 'grokhoty') several times and the charred grain was picked out manually during this process. The excavation reports of the Uch-Bash settlement from 1952 and 1953 mention 4272 identified grains of *Triticum* sp. and *Hordeum* sp. In addition, the quantities of charred grain from pit 16 in the excavation area are labelled I (eastern) and from pit 10 in area II (central) are called 'a box'. It is likely that they were not counted during identification and were stored at the Botanical Garden in the same box. Other unidentified biological remains were not examined and stored in the archive collection of the National Preserve of Tauric Chersonesos until recently, for example fish bones and scales in large numbers, were kept in large wooden boxes together with the soil from which they were extracted from the settlement. The exact amount of grain that such a box could have contained is unclear, but its presence nevertheless confirms that the settlement yielded significant quantities. After examining the available archaeological material and combining the chronology of the features with our palaeobotanical material results (Table 2), grains of *Triticum* sp. and *Hordeum* sp. were seen to be distributed across all horizons of the settlement: I-UB (158 grains), II-UB (2000 grains), III-UB (42 grains), IV-UB (70 grains), V-UB (+Ia-UB according to Kravchenko's (2020) revised chronology; 384 grains). The significant difference in the number of grains in different horizons is generally associated with the specifics of the economic activity represented in the features that were excavated. The large quantity of grains in a small number of features in the last horizon (V-UB) compared to other horizons is worthy of note. Strzheletskiy's excavations hardly touched the settlement areas where this horizon was present; it was represented by only a few pits and hence such a large quantity of grain from a small number of features in horizon V-UB seems significant.

During our excavations in 2006–2013 at Uch-Bash (Savelia & Kravchenko, 2006, 2007, 2008; Savelia et al., 2009; Kravchenko, 2010a, 2013; Kravchenko, et al., 2011, 2012), no grains were found due to excavation priorities and a lack of flotation, which was not possible because of the working conditions (demining of ammunition depots in the galleries of the rock on which the site is located (Kravchenko, 2023b) and the distance from the water source. Therefore, we analysed the ceramics from Uch-Bash, i.e. the collection of the 1950s excavations and recent finds, to identify the impressions of grains on their surface and fabric. This proved effective, not only providing palaeobotanical (archaeobotanical) data, but also correlating with the results presented in Strzheletskiy's field reports (Table 2).

All collections from the excavations conducted by Strzheletskiy (1952–1953), Savelia

https://doi.org/10.1017/eaa.2025.10014 Published online by Cambridge University Press

Table 2. *Carbonized palaeobotanical remains from features of the Uch-Bash settlement, excavations of 1952–1953 (after Strzheletskiy, 1952, 1953) with horizons identified according to Kravchenko (2011).*

Feature (horizon)	Plants (quantity)
	1952, Area I (Eastern)
Building 1 (II-UB)	*Triticum* sp. (1948 (1950))
Pit 1 (III-UB)	*Hordeum* sp. (2), *Cornus mas* (2), unidentified (2)
Pit 2 (III-UB)	*Hordeum* sp., *Triticum* sp. (9), *Vitis vinifera* (1), melon or cucumber (quantity unknown), unidentified (5)
Pit 3 (III-UB)	*Hordeum* sp. (N), *Triticum* sp. (N), unidentified (8)
Pit 4 (III-UB)	*Triticum* sp. or *Hordeum* sp. (quantity unknown)
Pit 6 (V-UB)	*Hordeum* sp. & *Triticum* sp. (6), *Cornus mas* (2), unidentified (4)
Pit 8 (V-UB)	*Vitis vinifera* (quantity unknown)
Pit 10 (V-UB)	*Hordeum* sp. & *Triticum* sp. (75)
Pit 12 (V-UB)	*Triticum* sp. *&* *Hordeum* sp. (297)
Pit 13 (III-UB)	*Hordeum* sp. & *Triticum* sp. (31), unidentified (2)
Pit 16 (II-UB)	*Hordeum* sp. & *Triticum* sp. (numerous remains), unidentified (12)
Pit 18 (IV-UB)	*Triticum* sp. *&* *Hordeum* sp. (19), unidentified (1)
Pit 19 (undated)	*Hordeum* sp. & *Triticum* sp. (21), unidentified (1)
Pit 23 (undated)	*Triticum* sp. (4), unidentified (4)
	1953, Area I (eastern)
Pit 28 (I-UB)	*Triticum* sp. (2), *Hordeum* sp. (8), *Cornus mas* (2)
Pit under a hearth (I-UB)	*Triticum* sp. (131), *Hordeum* sp. (19), *Quercus* sp. (2), weeds (kept in a matchbox)
Pit 31 (I-UB)	*Triticum* sp. (17)
Pit 32 (undated)	*Triticum* sp. (368)
Pit 35 (IV-UB)	*Hordeum* sp. (1)
Pit 36 (undated)	*Triticum* sp. (44), *Hordeum* sp. (21), unidentified (3)
Pit 37 (IV-UB)	*Triticum* sp. (or *Secale cereale*?) (50)
Pit 38 (undated)	*Triticum* sp. (6), *Hordeum* sp. (1), *Quercus* sp. (4)
Pit 46 (IV-UB)	*Cornus mas* (1)
Pit 50 (II-UB)	*Triticum* sp. or *Hordeum* sp. (2)
Pit 52 (I-UB)	*Hordeum* sp. (1)
Pit 59 (undated)	*Hordeum* sp. (92)
Pit 60 (undated)	*Hordeum* sp. (& *Triticum* sp.) (927), *Cornus mas* (4), *Cerasus* sp. (2)
Pit 66 (undated)	*Hordeum* sp. *(6)*
Pit 68 (undated)	*Triticum* sp. (7)
Pit 69 (I-UB)	*Cornus mas* (2)
Pit 70 (undated)	*Triticum* sp.*&* *Hordeum* sp. (12)
Pit 74 (undated)	*Quercus* sp. *(4)*
	1953, Area II (Central)
Pit 10 (I-UB)	*Hordeum* sp. contaminated with *Triticum* sp. (kept in a box)
Pit 11 (I-UB)	Unidentified (1)
Pit 12, 12a (V-UB)	*Triticum* sp. (6)
Pit 13 (undated)	*Triticum* sp. *&* *Hordeum* sp. (138), *Quercus* sp. (2)
Pit 15 (undated)	*Triticum* sp., *Cornus mas* (quantity unknown)

and Kravchenko (2006–2009), and Kravchenko (2010—2013) were analysed (National Preserve of Tauric Chersonesos, coll. nos. 35971–36028, 36293–36359, 37510, 37519, 37542, 37559, 37576, 37593, 37615; Scientific Archive of the Institute of Archaeology of the National Academy of Sciences of Ukraine, coll. nos. 1571, 1572, 1575). Materials from 2011 were reviewed before selection for further storage. In addition, finds from the settlement of Sakharna Holovka (1944 collection, excavated by O.K. Takhtai; excavations by S.F. Strzheletskiy in 1952; National Preserve of Tauric Chersonesos, coll. nos. 36194–36210) were also reviewed. A total

https://doi.org/10.1017/eaa.2025.10014 Published online by Cambridge University Press

of 148 impressions of grains and seeds from cultivated and weed plants were identified (Tables 3 and 4), of which 144 belong to cultivated species, and four to weeds. Impressions of grains of *Hordeum* sp. were found on pottery from horizons I and IV, while those of *Triticum* sp. were found in horizon II. On one small fragment of pottery from the excavation of surface deposits, eight impressions of *Hordeum* sp. were found and counted as a single case. Mass impressions of *Panicum* sp. on the bases of the pots were not taken into account, as they would introduce a statistical error (for details, see Gorbanenko, 2011, 2014, 2016).

Overall, the grain impressions on ceramics showed the same trends as the charred grain found in the features excavated in 1952–1953. The cereal impressions on ceramics from different horizons were unevenly distributed across the site, with a significant number of impressions found on ceramics from the last horizon, V-UB (Table 3). In addition, the number of impressions of emmer wheat (*Triticum dicoccum*) grains tends to increase from the first to the last horizons of Uch-Bash. This is also supported by the small amount of material from Sakharna Holovka (Table 4).

The ceramics from the excavations conducted between 2007 and 2013 also yielded some grain impressions. In addition to *Triticum* sp. and *Hordeum* sp., impressions of grains of *Panicum* sp. and rye (*Secale cereale*) were found in the pottery fabric. The pottery from the latest excavations was analysed as thoroughly as possible, including body sherds and indeterminate fragments that had not been transferred to the stored collections from the 1952–1953 excavations. Compared to the material recovered in 1952–1953, more impressions were identified. This increase is based on the analysis of all materials, and not just of those selected for storage. It is possible to compare it with the information from the early excavations only in general terms, since the methodology used for studying palaeobotanical remains from previous years, as can be seen from the published results, differs significantly from that used for the most recent excavations. The fragmentary nature of the collection from the 1952–1953 excavations also plays a role. However, the trend towards an increase in the number of grains in the last V-UB horizon is still evident (Table 5).

Cultivation, Storage, and Processing of Grain

In addition to the finds of charred grain and the impressions of grains on pottery, the early horizons revealed a complete assemblage related to the cultivation, storage, and

Table 3. *Impressions of grains and seeds of cultivated plants from Uch-Bash, by horizons and quantity, excavations of 1952–1953 (after Gorbanenko, 2016: 180).*

	I-UB	II-UB	III-UB	IV-UB	V-UB	Others	Total
Panicum sp.	5	1	3	7	8	5	29
Hordeum vulgare	1	7	1	6	11	5	31
Hordeum vulgare var. coeleste	-	-	-	-	-	1	1
Triticum dicoccum	2	4	5	8	7	11	37
Triticum monococcum	-	-	-	-	1	1	2
Triticum aestivum	2	2	-	1	4	3	12
Secale cereale	2	-	1	2	8	7	20
Pisum sativum	1	1	1	3	3	1	10
Vicia sp.	-	-	-	-	1	-	1
Cannabis sativa	-	-	-	-	1	-	1
Total	13	15	11	27	44	34	144

https://doi.org/10.1017/eaa.2025.10014 Published online by Cambridge University Press

Table 4. *Impressions of grains and seeds of cultivated plants from Sakharna Holovka, by horizons and quantity, excavations of 1952 (after Gorbanenko, 2016: 180).*

	I-UB	II-UB	III-UB	VI-G	Others	Total
Panicum sp.	1	-	-	-	2	3
Hordeum vulgare	1	-	-	1	1	3
Triticum dicoccum	-	1	-	1	2	4
Triticum aestivum	-	1	-	-	-	1
Secale cereale	-	-	1	-	-	1
Total	2	2	1	2	5	12

Table 5. *Impressions of grains and seeds of cultivated plants from Uch-Bash, by quantity, excavations of 2006–2013.*

	IV-UB (quantity/%)	V-UB (quantity/%)	Common to the site (with other horizons) (quantity/%)
Panicum miliaceum	7/29.2	8/21.1	29/22.5
Hordeum vulgare	6/25	11/28.9	31/24.1
Triticum dicoccum	8/33.3	7/18.4	37/28.7
Triticum aestivum	1/4.2	4/19.5	12/9.2
Secale cereale	2/8.3	8/21.1	20/15.5

processing of grain. These include agricultural tools, i.e. hoes, sickles with large flint inserts (Figures 2 and 3), which were found in abundance, large vessels used for roasting or drying (Figure 4: 4, Figure 5), large *pithoi* (Figure 4: 1–3) used for storing grain, grain pits and grinders (Figure 5).

A set of five flint inserts for sickles was found in pit 17 (Figure 2b: 5, 7, 9, 11, 12), one of which was not used after manufacture. The reason these items were found in a household pit is unknown but may be explained by a need for their urgent concealment. At the same time, the fact that these items were found together (perhaps as a 'hoard') suggests that such sets may have been personal possessions and that their production was specialized.

Other sickle inserts, their fragments, sickle blanks, and items in secondary use were found in the Uch-Bash features and layers: about fifty items in all (Razumov, 2016: 100, 102). This is a significant number compared to other settlements in the northern Pontic region and a significant number for the Uch-Bash settlement itself, representing twenty per cent of the flint assemblage (Razumov, 2016: 102). It is worth emphasizing that there is no evidence for the manufacture of these artefacts at the settlement; only signs of their repair, secondary use, and a few sickle blanks. The shine, so-called lustre, on the working blade of the sickles confirms that they were used for harvesting cereals (Shnyrelman, 1989: 47; Razumov, 2016: 101).

Several artefacts and sickle blanks come from a closed context: the floor of Building 2, which was destroyed in a fire. One item is a fragment of a sickle frame (Figure 3: 1), found next to a flint insert belonging to it (Figure 2a: 4), suggesting that the bone sickle broke during use. The handle was made from the mandible of a domestic cow. The spongy tissue from the alveoli was completely removed and the insert was apparently fixed in the centre with some unknown substance. The outer surface of the handle fragment is heavily polished; the right side is slightly damaged from use, as can be seen from the dents in the surface. Another cow mandible was found next to it (Figure 3: 2). The spongy tissue from this mandible was not entirely

https://doi.org/10.1017/eaa.2025.10014 Published online by Cambridge University Press

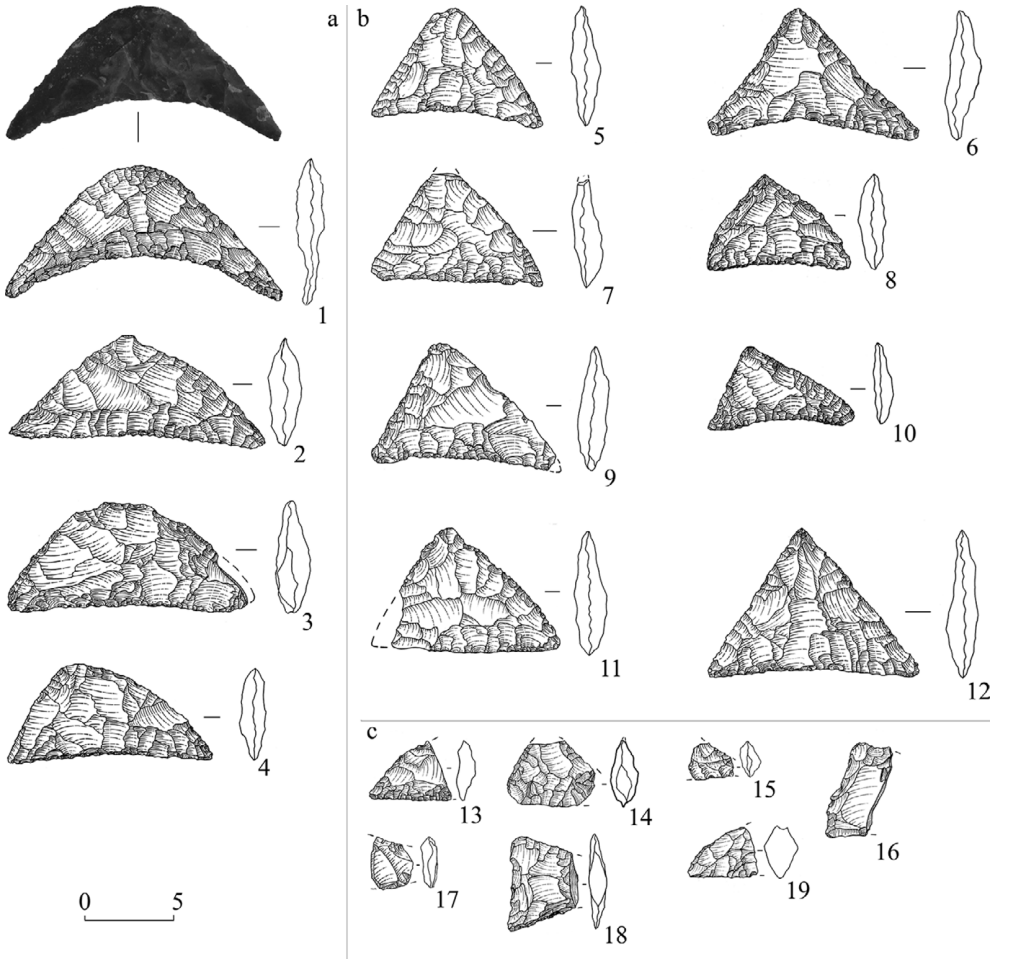

Figure 2. *Flint inserts (a, b) and fragments (c). b: nos. 5, 7, 9, 11, and 12 belong to a 'hoard' of flint inserts found in pit 17.* Reproduced by permission of the National Academy of Sciences of Ukraine (NAN Ukrayiny).

removed. It is likely that the bone had been softened before processing, as the piece was somewhat flattened by the collapse of Building 2's ceiling in the fire, and the processed parts of the bone, where the sponge tissue had already been removed, was chipped off (Figure 3: 3). The inner edge of this jaw had traces of polishing, which may indicate that it had been used as a tool for removing meat from hides. However, traces of further unfinished processing of this bone, such as, for example, the removal of spongy tissue from the alveoli, probably indicates an attempt to make a handle from it, similar to the handle described above. The broken handle and insert refit perfectly, as shown in the reconstruction (Figure 3b). Further experiments with inserting flint inserts from different contexts, somewhat different in shape, also fit with a broken sickle (Figure 3c) (Razumov, 2016: 102, 103, fig. 3.2.5; Sergeeva & Kravchenko, 2016: 171, 172).

Another specialized activity of the Older Pre-Taurian period (late twelfth century BC

https://doi.org/10.1017/eaa.2025.10014 Published online by Cambridge University Press

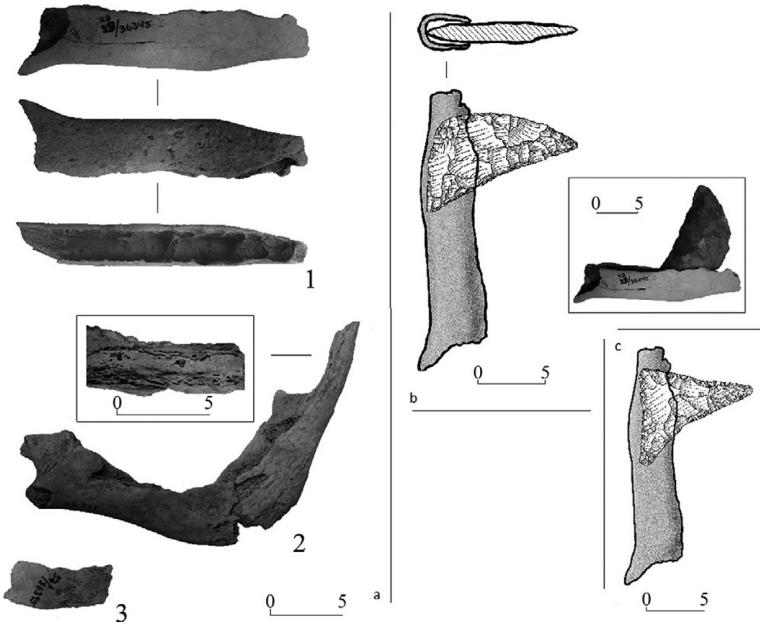

Figure 3. *Bone frames from the floor of Building 1 (a); reconstructions of frames and inserts as sickles, from the floor Building 1 (b), and variant from a different context (c).* Reproduced by permission of the National Academy of Sciences of Ukraine (NAN Ukrayiny).

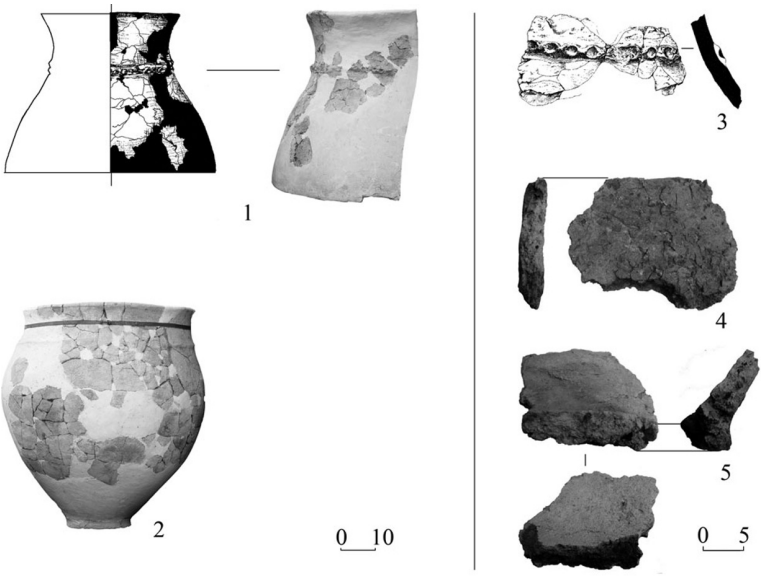

Figure 4. *Vessels:* pithoi *(1, 2, 3) for storing grain and fragments of roasting or drying vessels (4, 5) (after Kravchenko, 2011: 143).* Reproduced by permission of Volynski starozhytnosti and the National Academy of Sciences of Ukraine (NAN Ukrayiny).

https://doi.org/10.1017/eaa.2025.10014 Published online by Cambridge University Press

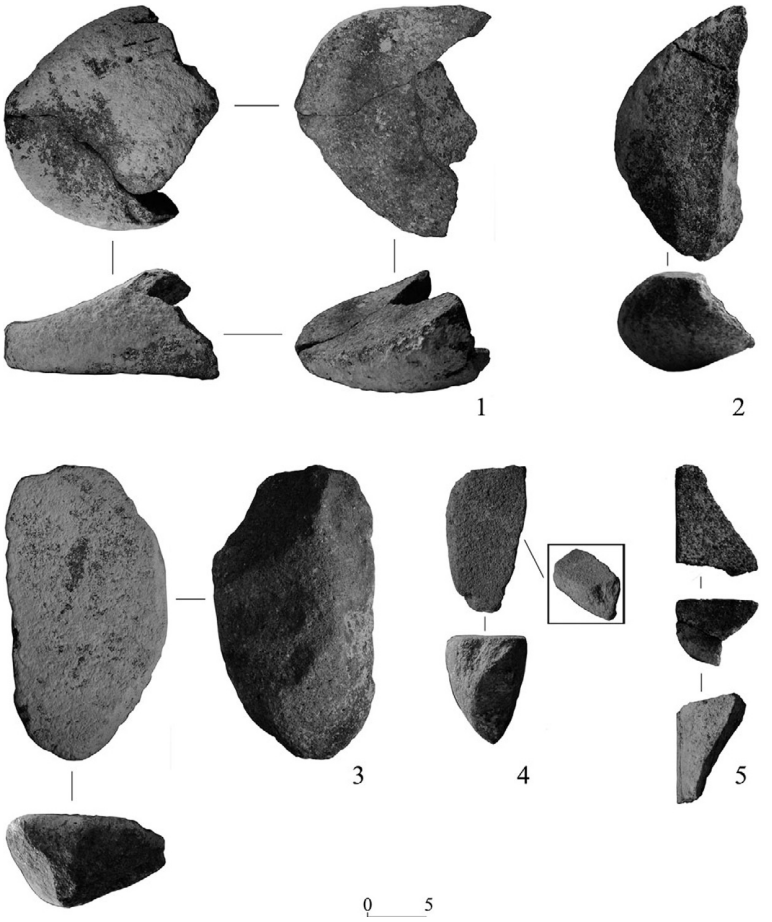

Figure 5. *Grinders and fragments of grinding stones.* Reproduced by permission of the National Academy of Sciences of Ukraine (NAN Ukrayiny).

to the turn of the tenth/ninth centuries BC) may have been the processing of grain, as attested by the remains of a brazier and parts of grinding stones (Figure 5) found at the level of a layer of soil (without anthropogenous influence) over the bedrock in the northeastern part of the northern excavation area, possibly in the courtyard area, subsequently covered by later strata. These grinders, together with other stone items, were analysed in detail by the author in a monograph dedicated to the economy of the inhabitants of the Inkerman Valley. It should be noted that fragments of grinders are mentioned quite often in Strzheletskiy's excavation reports in features that we attribute to the early horizons.

Items associated with harvesting (sickles) and the primary processing of grain, such as vessels used for roasting grain (Figure 4: 4, 5), together with grinding stones and their fragments were concentrated mainly in the northern part of the settlement, where grain pits from the earliest horizon (late twelfth century BC to late tenth century BC) were found: these pits, originally used for grain storage, had a secondary use as refuse pits, into which the clay paste typical for *pithoi* in the walls and bottom were partly saved (Kravchenko, 2016a: 245). The *pithoi*

https://doi.org/10.1017/eaa.2025.10014 Published online by Cambridge University Press

(Figure 4: 1–3) and most of the pits that contained the remains of charred grain were excavated in the central part of the settlement. These were abandoned as a result of a fire, approximately at the turn of the tenth to the ninth century BC. The *pithoi* are large-volume storage vessels with thick walls made from clay mixed with much straw, and were reported as household vessels in the 1952–1953 excavations. The number of their fragments is substantial; for example, thirty-seven rim fragments, seven base fragments, and 430 body sherds were found on the floor of house 1, which comprised one large vessel (Figure 4: 1). Since the large number of fragments indicates the large size of these vessels, rather than an abundance of different vessels, the sherds from such *pithoi* found in household pits were not counted within the context of refuse disposal. Nevertheless, the presence of *pithoi* fragments in almost all features and contexts from the early horizons indicates their widespread use. The statistics for all finds at Uch-Bash and Sakharna Holovka are presented in alongside an analysis of all categories of finds and their chronology, including that of the early periods of the Kyzyl-Koba culture. The features and stratigraphy of Uch-Bash and Sakharna Holovka are analysed in a separate monograph (Kravchenko, 2011).

The activities associated with the cultivation and harvesting of cereals, as well as the processing and storage of grain and a large number of tools connected with these tasks, indicate that cereal production was a primary aspect of Uch-Bash in the Older Pre-Taurian period. Although the source material does not allow us to reconstruct the yields or sown areas, the significant number of grain residues and the large number of grinders and sickles are noteworthy. The numerous sickles and the presence of five sickle inserts hidden in a pit from the early horizon also testify to the widespread use of these tools for harvesting cereals. This suggests the accumulation of a considerable harvest at the settlement in the autumn, followed by storage and processing until the next harvest. Hypothetically, it can be assumed that harvest could have been used as a unit of exchange for obtaining imported metal or flint. This economic cycle was seasonal and occurred during the warm season. Adjusted for the climate of south-western Crimea, it may be possible to propose that there were two cycles for growing barley (*Hordeum vulgare*).

Grain and other produce

According to previous studies (Gorbanenko, 2016: 185), for horizon IV at Uch-Bash the main cultivated grain crop was emmer (*Triticum dicoccum*), followed by barley (*Hordeum vulgare*) (a little less than a third); other crops (in descending order) included rye (*Secale cereale*), millet *(Panicum miliaceum*), and bread wheat (*Triticum aestivum*)—each accounting for less than a tenth. Horizon V presents a slightly different picture. *Hordeum sp.* is best represented (one third), emmer (*Triticum dicoccum*) accounts for one quarter, *Secale cereale.* The indicators for bread wheat (*Triticum aestivum*) are few (one eighth), but there is no doubt that it was cultivated. Low proportions of millet (*Panicum miliaceum*) complete the list (Gorbanenko, 2016: 186). At the beginning of the Tauric period (second half of the eighth century BC to first half of the seventh century BC), Uch-Bash changed entirely (Kravchenko, 2016b: 255). Agriculture also underwent changes. *Triticum dicoccum, Triticum aestivum*, and *Hordeum vulgare* show an increase in the palaeobotanical material and *Secale cereale* also rises. The absence of flint inserts in sickles from the horizons of the Tauric

https://doi.org/10.1017/eaa.2025.10014 Published online by Cambridge University Press

period is notable. All sickle fragments in these layers were reused to make other items or as strike-a-lights. There is no evidence for oval grinders in the Tauric period, but small one-handled upper stones of querns are present. A *Vitis vinifera* seed from a pit of the Tauric period (pit 8, horizon V-UB) suggests that it continued to be grown or harvested (a seed of *Vitis vinifera* was also found in an earlier context, pit 2, horizon III-UB, late tenth early ninth century BC) by the inhabitants of the Inkerman Valley at that time.

The analysis of the palaeobotanical data indicates that agriculture played an important part in the food supply of the inhabitants of Uch-Bash. The presence of weeds indicates the long-term use of plots of land for cultivation. The increase in the share of *Secale cereale* in horizon V (second half of the eighth century BC to first half of the seventh century BC) in comparison to the previous horizon IV (ninth to mid-eighth century BC) also speaks for the importance of agriculture. In addition, the growing role of *Secale cereale* alongside *Triticum dicoccum*, against the background of the decline of *Triticum aestivum*, may indicate some improvement in tillage techniques that took place alongside a change in the population of Uch-Bash (Kravchenko, 2007, 2020). Perhaps agriculture was supplemented by horticulture and viticulture. Agricultural produce may also have served as raw materials for spinning and weaving, and potentially for oil production, but this requires further research.

Discussion

Currently, Uch-Bash is the only settlement in the northern Black Sea region to have yielded such significant evidence for agriculture from the twelfth to the seventh centuries BC. Other settlements have produced much sparser palaeobotanical data in the form of grains and grain impressions on ceramics, quantity and variety of agricultural tools, and means of processing and storing grain.

Crimea had agriculture in earlier times, during the Neolithic-Eneolithic period (Motuzaite-Matuzeviciute et al., 2013; Salavert et al., 2014) or in the later Bronze Age (Cordova et al., 2001a). However, the cultural diversity of Crimea was transformed dramatically, in terms of its economy and the composition of the population, during the period of historical change in the Pontic steppe in the Bronze Age. Migrants brought their own traditions to the region that differed from local customs. Special studies dedicated to the economy of the Bronze Age of the Crimea have not been conducted in the last half century and it is therefore not currently possible to trace a continuous line of agricultural development in the Crimea from the Neolithic-Eneolithic period onwards.

There is no trace of continuity between the assemblages of the Late Bronze Age and Early Iron Ages from Uch-Bash and Sakharna Holovka, and those from the first ancient Greek settlements in Crimea. No special correlation of materials from the pre-Classical and Classical layers of the Crimean sites has been carried out, and individual studies bypass this issue, citing verbal reports by previous researchers about the futility of such an undertaking (Cordova & Leman, 2003, 2006: 435; Cordova et al., 2001a, 2001b). Without delving into the reasons why the Soviet generation of Sevastopol archaeologists did not want to cooperate in this area with Western scientific institutions, I would point out, in light of our research, that such an endeavour is far from futile. Some palynological data obtained from Crimea shed light on climatic and vegetational change in Crimea during the period of Greek colonization and later during the Byzantine period (Cordova et al., 2001a: 43–46). However, this research did not provide information on agriculture in pre-Greek times, or other specific data on the palaeoecology of Crimea during

https://doi.org/10.1017/eaa.2025.10014 Published online by Cambridge University Press

the Bronze and Early Iron Ages, probably due to a lack of systematic archaeological research of sites from this period in the region.

The Bilozerka culture settlements, where quantities of grain, including *Triticum* sp., and finds associated with agriculture, including sickles, *pithoi* storage vessels, braziers, and oval grinding stones, were also found, offer the closest parallels for the early Uch-Bash horizon. Flint inserts in sickles are typical for the Bilozerka culture, but they are found in much smaller quantities there. For example, in the publications of the assemblages from the Bilozerka culture settlements in the left bank of the Middle Dnipro (river Dnieper), only some flint sickles are reported (Romashko, 2013: 109, 207): these are small inserts with a retouched working edge, except for a few items, such as a sickle found at the Balta settlement in Budzhak in the Middle Dniester (Vanchugov, 1990: 102). As for finds of flint sickles on the Middle Dniester, they are not as numerous as those at Uch-Bash but include not only small inserts with a retouched working edge, but also completely retouched subtriangular inserts, including quite large exemplars (Krushelnytska 1998: *passim*). The Neporotove settlement of the Final Bronze and Early Iron Age on the Middle Dniester also yielded flint drills similar to those from Uch-Bash (Krushelnytska, 1998: figs. 37, 12; 43, 9). At the sites of the Forest-Steppe Dnipro region, similar flint inserts (but not identical to those from Uch-Bash) appear only on sites of the Final Bronze Age; their appearance is more in line with the Chornyi Lis culture than the Bilohrudivka culture dated to the Final Bronze Age and Early Iron Age of the Middle Dnipro (Kushtan, 2013: fig. 46, 27). Finally, at sites in the Middle Dnipro region, inserts from the Subotiv settlement of the Final Bronze and Early Iron Age (Terenozhkin, 1961: 84) look more archaic than those from Vovkivka of the Final Bronze Age in north-eastern Ukraine (Kushtan, 2013: fig. 46, 27) and are more similar to those found on Late Bronze Age settlements in Crimea (Kolotukhin, 2003: fig. 65).

Flint artefacts are present in the period immediately preceding the appearance of the Uch-Bash settlement in the Final Bronze Age, and possibly the Crimean sites partially synchronous with it, such as Chuyuncha, Druzhne 2, or Alma 1. However, judging by the publication of these items, they differ from the Uch-Bash inserts both in size and form (Leskov, 1970: 34; Kolotukhin, 2003: fig. 65). Flint inserts typologically similar to those from Uch-Bash are presented among the finds from the Kyzyl-Koba settlement (Kolotukhin, 1996: 127), which is synchronous with the Uch-Bash III and IV horizons, and the Ashlama-Dere settlement (Kris, 1981: pl. 6, 1, 4), which is synchronous with Uch-Bash's horizons IV and V. The Kyzyl-Koba assemblage is, however, dominated by smaller inserts compared to those from Uch-Bash, and Ashama-Dere contains one such small subtriangular flint insert.

In Uch-Bash, intact flint inserts in sickles are found mainly in the horizons of the Older Pre-Taurian period, including a possible 'hoard' of five intact inserts discovered in pit 17 of the Eastern excavation area in horizon I. Elsewhere on site, whole sickles are found in layers in the northern part of the settlement. Fragments of sickles, in addition to those assigned to the Older Pre-Taurian period, are found in the loamy layers of the Younger Pre-Taurian period in the Western excavation area; one whole sickle insert was also found in the layers of the Central excavation area from these periods. The ash and refuse layers of the Western area primarily contain fragments of sickle inserts in secondary use.

The extremely narrow range of published palaeobotanical results from the Bilozerka culture settlements does not allow us to compare these directly with the Uch-Bash

https://doi.org/10.1017/eaa.2025.10014 Published online by Cambridge University Press

data. Nevertheless, the published results from the late Sabatinovka culture settlements such as Novokyivske and Vynohradnyi Sad I dated to the Late Bronze Age of the Lower Dnipro (*Triticum dicoccum*, *Triticum aestivum*, *Triticum monococcum*, *Hordeum vulgare*, *Panicum* sp., *Vicia* sp.; Gershkovish, 2011: 169) generally coincide with the palaeobotanical results from Uch-Bash.

Grain and grape seeds were found in the contemporaneous fortified settlement of Dykyi Sad in Mykolayiv in southern Ukraine, at the settlement of Etulia on the Lower Danube in Moldova (Yanushevich, 1986: 14–16), and on several other sites on the Ukrainian Black Sea coast. During the Late Bronze Age, Eastern Europe also saw a transition to broomcorn millet, rye, spelt, bread and glume wheat cultivation (Kvapil, 2021: 249). In particular, the role of *Triticum durum* varieties was increasing (Wardle et al., 1980; Jones et al., 1986). So far, such varieties have not been identified in Late and Final Bronze Age layers on sites in the northern Black Sea region, but the large quantities of different grains of the genus *Triticum* may indirectly suggest that the agricultural practices and origin at Uch-Bash were influenced from the West, the Balkans, and the southern Carpathian regions of Eastern Europe, where the tendency towards increased wheat cultivation can be traced from the Late Bronze Age onwards and is likely to have been caused by climate change.

Conclusions

The finds at the Uch-Bash settlement include a complete set of tools used for growing, storing, and processing grain. The large number of harvesting tools (sickles) is mirrored by a significant quantity of grain found in the Uch-Bash features. Moreover, large grain harvests are indicated by the size of the *pithoi* (large grain storage vessels), the abundant fragments of such vessels, and the so-called braziers found in refuse deposits.

The cereals grown by the people in the Inkerman Valley, in the form of charred grains recovered from excavated features and as impressions on ceramic at Uch-Bash, namely *Hordeum* sp., *Triticum* sp., *Secale cereale, Panicum* sp., have been identified at various times and using different methods; impressions of *Pisum* sp. are also mentioned among the results of the ceramic analysis. The distribution of these species is attested across all chronological horizons.

Currently, archaeological investigations suggest that agriculture did not play a predominant role in the economy of the tribes that inhabited Crimea during the Bronze Age, but this is contradicted by the early features excavated at Uch-Bash. The people inhabiting the Inkerman Valley at the turn of the Bronze Age to the Iron Age (twelfth to seventh century BC) not only practised simple agriculture, but also used their agronomic skills to cultivate cereals.

The presence of developed agriculture, starting from the early horizons of Uch-Bash, speaks for the availability of soils suitable for growing cereals as one of the main factors for the choice to found a settlement. Areas of loamy soils without rubble located near the settlement may have been tilled. In this part of Crimea, the soil formation is characterized by soils with crushed stone (*Hrunty Kryms'koyi Oblasti*, 1967). The absence of stones may thus be associated with intentional cultivation, but it is not currently possible to determine when this occurred.

The discovery of *Vitis vinifera* seeds in the early period of Uch-Bash, which is synchronous with the Late Mycenaean period in Greece, also suggests a deep knowledge of the cultivation or domestication of wild plants. Anthony Snodgrass (1971: 378–80), on the issue of changes in the social organization of the Greek population between the

https://doi.org/10.1017/eaa.2025.10014 Published online by Cambridge University Press

Mycenaean and Classical periods, raised the question of a detailed study of agriculture. While providing data on the mainly meat-based diet of the Mycenaean settlements, Snodgrass highlighted the emergence of a significant cereal component at the beginning of Greek history, with numerous questions related to the transitional period. It is important to note that charred *Vitis vinifera* seeds are rarely found in the northern Black Sea region in this transition period; its presence at Uch-Bash indicates established connections of the northern Pontic region with the Balkans and the Mediterranean.

The large quantity of cereals retrieved from Uch-Bash is so far unique among the contemporaneous settlements of the northern Black Sea coast. In this article, we have summarized all the evidence from the settlements of Uch-Bash and Sakharna Holovka related to the agricultural practices of their inhabitants. While this is insufficient to reconstruct the full story of the emergence and direction of the economy in the Inkerman Valley, or to compare our data with the agriculture of other centres of the Black Sea region and the Mediterranean, the available studies and materials testify to the existence of agriculture as one of the main aspects of the economy of the Inkerman Valley at the turn of Bronze Age to the Iron Age.

References

Cordova, C.E. & Leman, P.H. 2003. Archaeopaleology of Synanthropic Vegetation in the *Chora* of Chersonesos, Crimea, Ukraine. *Journal of Archaeological Science*, 30: 1483–501 https://doi.org/10.1016/S0305-4403(03)00044-X

Cordova C.E. & Lehman D.H. 2006. Mediterranean Agriculture in South-Western Crimean Paleo-environments and Early Adaptations. In: D.I. Peterson, I.M. Popova & A.T. Smith, eds. *Beyond the Steppe and the Sown* (Colloquia Pontica, 13). Brill. pp. 425–47. https://doi.org/10.1163/9789047408215_031

Cordova, C.E., Lehman, P.H. & Gerasimenko N.P. 2001a. Paleoecological Investigations in the Heraklean Peninsula and Adjacent Areas. In: J.C. Carter, ed. *The Study of Ancient Territories: Chersonesos and Metaponto, 2001 Annual Report*. Austin (TX): Institute of Classical Archaeology, University of Texas, pp. 43–46.

Cordova, C.E., Rybak, A.R. & Leman, P.H. 2001b. Vegetation Patterns and Conservation Issues in Southern Crimea. *Post-Soviet Geography and Economics*, 42: 362–85. https://doi.org/10.1080/10889388.2001.10641176

Gershkovich, Ya.P. 2011. Global Causes of Some Local Phenomena During the Late Bronze Age in the Northen Pontic Steppe. In: E. Sava, B. Govedarica & B. Hänsel, eds. *Der Schwarzmeerraum vom Äneolithikum bis in die Früheisenzeit (5000—500 v. Chr.)* vol. 2. Rahden: Marie Leidorf, pp. 166–77.

Gorbanenko, S.A. 2011. Metody interpretatsiyi sil's'kohospodars'kykh materialiv. *Arkheolohiya i davnya istoriya Ukrayiny*, 5: 201–14 (in Ukrainian).

Gorbanenko, S.A. 2014. Zernove hospodarsto siveryan. *Arkheolohiya*, 1: 113–23 (in Ukrainian).

Gorbanenko, S.A. 2016. Zemledelie. In: E.A. Kravchenko, ed. *Ot bronzy k zhelezu: khozyaystvo zhyteley Ynkermanskoy dolyny*. Kyiv: NAN Ukrayiny, pp. 175–90 (in Russian).

Hrunty Kryms'koyi Oblasti 1967. Na pidstavi materialiv obsliduvan' hruntiv 1957–61 rr. Skladeno in-tom 'Ukrzemproyekt' ta Ukr. NDI hruntoznavstva im. O.N. Sokolovs'koho v 1966 r. Kyiv (in Ukrainian).

Jones, G., Wardle, K., Halstead, P. & Wardle, D. 1986. Crop Storage at Assiros. *Scientific American*, 254: 96–103.

Kolotukhyn, V.A. 1996. *Gornyy Krym v epokhu pozdney bronzy – nachale zheleznoho veka*. Kyiv: Yuzhnohorodskye vedomosty (in Russian).

Kolotukhyn, V.A. 2003. *Pozdnyy bronzovyi vek Kryma*. Kyiv: Stylos (in Russian).

Kravchenko, E.A. 2007. K voprosu ob izmeneniiakh v materialnoi kulture naseleniia Gornogo Kryma v predskifskoe vremia. *Revista archeologica*, SN, 3: 282–94 (in Russian).

Kravchenko, E.A. 2009. Materialy rannohalshtatskoho chasu poselennia Uch-Bash. *Arkheolohiya*, 1: 26–40 (in Ukrainian).

Kravchenko, E.A. 2010a. Otchet o raskopkakh poselenyya Uch-Bash v 2010 h (in Russian)

https://doi.org/10.1017/eaa.2025.10014 Published online by Cambridge University Press

(Unpublished report, Kyiv. Naukovyy arkhiv Instytutu arkheolohiyi Natsional'noyi Akademiyi nauk Ukrayiny, 2010/46).
Kravchenko, E.A. 2010b. Khronolohiia Molodshoho dotavrskoho periodu kyzyl-kobynskoi kultury. *Arkheolohiya*, 1: 11–26 (in Ukrainian).
Kravchenko, E.A. 2011. *Kyzyl-kobynska kultura u Zakhidnomu Krymu*. Kyiv & Lutsk: Volynski starozhytnosti (in Ukrainian).
Kravchenko, E.A. 2013. Otchet o raskopkakh poselenyya Uch-Bash v 2013 h (in Russian) (Unpublished report, Kyiv. Naukovyi arkhiv Instytutu arkheolohiyi Natsional'noyi Akademiyi nauk Ukrayiny, 2013/64).
Kravchenko, E.A. 2016a. Obrabotka organicheskikh materialov, aspekty byta i infrastruktura. In: E.A. Kravchenko, ed. *Ot bronzy k zhelezu: khozyaystvo zhyteley Ynkermanskoy dolyny*. Kyiv: NAN Ukrayiny, pp. 235–54 (in Russian).
Kravchenko E.A. 2016b. Khoziaistvo zhitelei Inkermanskoi doliny perekhoda ot bronzovogo k zheleznomu veku. In: E.A. Kravchenko, ed. *Ot bronzy k zhelezu: khozyaystvo zhyteley Ynkermanskoy dolyny*. Kyiv: NAN Ukrayiny, pp. 255–72 (in Russian).
Kravchenko, E.A. 2020. Ceramic Vessel From Mound Near Zolne Village in the Crimea. *Arheologia*, 4: 73–81. https://doi.org/10.15407/archaeologyua2020.04.073
Kravchenko, E. 2023a. The Rests of Fortification of Uch-Bash Hillfort in the South-Western Crimea. *Eminak Scientific Quarterly Journal*, 2(42): 87–108. https://doi.org/10.33782/eminak2023.2(42).643
Kravchenko, E.A. 2023b. Dosvid okhoronnykh arkheologichnykh doslidzhen` na ob`yekti rozminuvannia Inkermans`ki shtol`ni (poselennia Uch-Bash) v misti Sevastopol`. *Muzeynyi visnyk*, 23: 56–58 (in Ukrainian).
Kravchenko, E.A., Razumov, S.N. & Ovchynnykov, E.V. 2011. Otchet o raskopkakh poselenyya Uch-Bash v 2011 h (in Russian) (Unpublished report, Kyiv. Naukovyi arkhiv Instytutu arkheolohiyi Natsional'noyi Akademiyi nauk Ukrayiny, 2011/102).
Kravchenko, E.A., Razumov, S.M., Kvitnyts'kyy, M.V. & Moskalenko, A.V. 2012. Otchet o raskopkakh poselenyya Uch-Bash v 2012 h (in Russian) (Unpublished report, Kyiv. Naukovyi arkhiv Instytutu arkheolohiyi Natsional'noyi Akademiyi nauk Ukrayiny, 2012/87).
Kris, Kh.Y. 1981. Kyzyl-kobynskaya kul'tura y tavry. *Arkheologia SSSR, Svod arkheolohycheskykh ystochnykov*. Vol. D1-7. Moskva: Nauka, pp. 5–127 (in Russian).
Krushelnytska, L. 1998. *Chornolis'ka kul'tura Seredn'oho Prydnistrov'ya*. L'viv: L'vivs'ka naukova biblioteka im. V. Stefanyka Natsional'noyi Akademiyi nauk Ukrayiny (in Ukrainian).
Kushtan, D.P. 2013. Pivden' Lisostepovoho Podniprov'ya za doby pizn'oyi bronzy. *Arkheolohichnyi al'manakh*, 29: 7–232 (in Ukrainian).
Kvapil, L.A. 2021. Bronze Age Europe: Revolutions in Agricultural Adaptation. In: D. Hollander & T. Howe, eds. *A Companion to Ancient Agriculture*. Hoboken (NJ): John Wiley & Sons, pp. 241–64. https://doi.org/10.1002/9781118970959
Leskov, A.M. 1970. Kyrovskoe poselenye. In: A.M. Leskov, ed. *Drevnosty vostochnoho Kryma*. Kyiv: Naukova dumka, pp. 7–58 (in Russian).
Motuzaite-Matuzeviciute, G., Telizhenko, S. & Jones, M.K. 2013. The Earliest Evidence of Domesticated Wheat in the Crimea at Chalcolithic Ardych-Burun. *Journal of Field Archaeology*, 38: 120–28. https://doi.org/10.1179/0093469013Z.00000000042
Razumov, S.N. 2016. Izdeliia iz kremnia: izgotovlenie i ispolzovanie. In: E.A. Kravchenko, ed. *Ot bronzy k zhelezu: khozyaystvo zhyteley Ynkermanskoy dolyny*. Kyiv: NAN Ukrayiny, pp. 99–106 (in Russian).
Romashko, V.A. 2013. *Zaklyuchytel'nyy etap pozdneho bronzovoho veka Levoberezhnoy Ukrayny (po materyalam bohuslavsko-belozerskoy kul'tury*). Kyiv: KNT (in Russian).
Salavert, A., Messager, E., Motuzaite-Matuzeviciute, G., Lebreton, V., Bayle, G., Crépin, L. et al. 2014. First Results of Archaeobotanical Analysis from Neolithic Layers of Buran Kaya IV (Crimea, Ukraine). *Environmental Archaeology*, 20: 274–82. https://doi.org/10.1179/1749631413Y.0000000016
Savelya, O.Ya. & Kravchenko, E.A. 2006. Otchet Sevastopol'skoy arkheolohycheskoy ekspedytsyy ob okhranno-spasatel'nykh yssledovanyyakh Ynkermanskoho otryada na poselenyy Uch-Bash (2006) (in Russian) (Unpublished report, Kyiv. Naukovyi arkhiv Instytutu arkheolohiyi Natsional'noyi Akademiyi nauk Ukrayiny, 2006/2).
Savelya, O.Ya. & Kravchenko, E.A. 2007. Otchet o raskopkakh poselenyya Uch-Bash (2007) (in Russian) (Unpublished report, Kyiv. Naukovyi arkhiv Instytutu arkheolohiyi Natsional'noyi Akademiyi nauk Ukrayiny, 2007/13).

https://doi.org/10.1017/eaa.2025.10014 Published online by Cambridge University Press

Savelya, O.Ya. & Kravchenko, E.A. 2008. Otchet o raskopkakh poselenyya Uch-Bash (2008) (in Russian) (Unpublished report, Kyiv. Naukovyi arkhiv Instytutu arkheolohiyi Natsional'noyi Akademiyi nauk Ukrayiny, 2008/13).

Savelya, O.Ya., Kravchenko, E.A., Lysenko, R.V. & Shevchenko, D.A. 2009. Raskopky poselenyya Uch-Bash (2009) (in Russian) (Unpublished report, Kyiv. Naukovyi arkhiv Instytutu arkheolohiyi Natsional'noyi Akademiyi nauk Ukrayiny, 2009/2).

Sergeeva, M.S. & Kravchenko, E.A. 2016. Obrabotka kosti i roga i izdeliia iz nikh. In: E.A. Kravchenko, ed. *Ot bronzy k zhelezu: khozyaystvo zhyteley Ynkermanskoy dolyny*. Kyiv: NAN Ukrayiny, pp. 151–72 (in Russian).

Shnyrelman, V.A. 1989. Vozniknovenie proizvodiashchego hoziaystva. *Problema pervichnyh i vtorichnyh faktorov*. Moskva: Nauka (in Russian).

Snodgrass, A.M. 1971. *The Dark Age of Greece*. Edinburgh: Edinburgh University Press.

Strzheletskiy, S.F. 1951a. Ocherki istorii Gerakleiskogo poluostrova i ego okrugi v epokhu bronzy i rannego zheleza (seredina II tys. do n. e. — V v. do n. e.). Sevastopol, 1951 s dopolneniiami 1953–1954 gg (in Russian) (unpublished doctoral dissertation, Nauchnyi arkhiv Natsionalnogo zapovednika Khersones Tavricheskii, Sevastopol, 1343).

Strzheletskiy, S.F. 1951b. Ocherki istorii Gerakleiskogo poluostrova i ego okrugi v epokhu bronzy i rannego zheleza (seredina II tys. do n. e. — V v. do n. e.) (in Russian) (abstract of an unpublished doctoral dissertation, Moscow, Institute of Archaeology of the Academy of Sciences of the USSR).

Strzheletskiy S.F. 1952. Otchet o raskopkakh rannetavrskoho poselenyya Uch-Bash X—VIII vv. do n.e. (in Russian) (Unpublished report, Sevastopol. Naukovyi arkhiv Natsional'noho zapovidnyka Khersones Tavriys'kyy 680/I—III).

Strzheletskiy S.F. 1953. Otchet o raskopkakh rannetavrskoho poselenyya Uch-Bash (in Russian) (Unpublished report, Sevastopol. Naukovyi arkhiv Natsional'noho zapovidnyka Khersones Tavriys'kyy 690/I).

Terenozhkin, A.Y. 1961. *Predskyfskyy peryod na Dneprovskom Pravoberezh'e*. Kyiv: Naukova dumka (in Russian).

Vanchugov, V.P. 1990. *Belozerskye pamyatnyky v Severo-Zapadnom Prychernomor'e*. Kyiv: Naukova dumka (in Russian).

Wardle, K.A., Halstead, P. & Jones, G. 1980. Excavations at Assiros, 1975–9: A Settlement Site in Central Macedonia and its Significance for the Prehistory of South-East Europe. *Annual of the British School at Athens*, 75: 229–67. https://doi.org/10.1017/S0068245400006420

Yanushevich, Z.V. 1986. *Kul'turnye rastenyya Severnoho Prychernomor'ya: paleoetnobotanycheskye issledovanyya*. Kishinev: Shtiyntsa (in Russian).

Biographical Notes

Evelina Kravchenko is a senior research fellow at the Institute of Archaeology of the National Academy of Sciences of Ukraine. She studied world history at the Ivan Franko National University in Lviv (1998) and obtained her MA from the National University of the Kyiv-Mohyla Academy (2002) and her PhD from the Institute of Archaeology of the National Academy of Sciences of Ukraine (2008). She has directed excavations and worked on several international projects in Crimea from 2001 to 2014. She has since been working in Kyiv on the material from her excavations and is monitoring the archaeological heritage of occupied Crimea. Evelina headed the Inkerman expedition (https://iananu.org.ua/struktura-ia/naukovi-viddili/viddil-arkheologiji-rannogo-zaliznogo-viku/ekspeditsiji/inkermanska-ekspeditsiya) of the Institute of Archaeology of the National Academy of Sciences of Ukraine until 2014. Since 2016 she has conducted research on sites of the Middle Dnieper region.

Address: Department of Early Iron Age Archaeology, Institute of Archaeology of the National Academy of Sciences of Ukraine, 12 Volodymyr Ivasyuk Ave., Kyiv–04210, Ukraine. [email: evekravchenko@gmail.com]. ORCiD: 0000-0001-7238-7417.

https://doi.org/10.1017/eaa.2025.10014 Published online by Cambridge University Press

Culture, stockage et traitement des céréales dans la vallée d'Inkerman en Crimée au passage de l'âge du Bronze à l'âge du Fer

Cet article concerne l'économie de l'un des rares habitats fortifiés de l'âge du Bronze final et du début de l'âge du Fer sur la côte septentrionale de la mer Noire, le site d'Uch-Bash, ainsi que son établissement satellite, Sakharna Holovka, dans la vallée d'Inkerman dans le sud-ouest de la Crimée. Les fouilles archéologiques des années 1950 et celles menées plus récemment ont fourni de nombreuses données sur la cultivation des plantes sur ce site, notamment des grains carbonisés, des empreintes de grains sur la céramique, des outils servant à la récolte et au traitement des cultures, des récipients de stockage et autres objets. Des données ont également été obtenues sur le type de plantes cultivées dans la vallée d'Inkerman. L'ensemble de ces éléments démontre que la production des céréales jouait un rôle majeur dans l'économie de la Crimée au passage de l'âge du Bronze à l'âge du Fer. Translation by Madeleine Hummler

Mots-clés: âge du Bronze final, début de l'âge du Fer, agriculture, Crimée

Anbau, Lagerung und Verarbeitung von Getreide im Inkermantal auf der Krim an der Wende der Spätbronzezeit zur Früheisenzeit

Dieser Artikel betrifft die Wirtschaft in einer der wenigen befestigten Siedlungen der Spätbronzezeit und der Früheisenzeit an der nördlichen Küste des Schwarzen Meeres, die Anlage von Uch-Bash, und in ihrer Satellit-Siedlung, die Stätte von Sakharna Holovka, im Inkermantal im Südwesten der Krim. Die archäologischen Grabungen in den 1950er-Jahren und in jüngster Zeit haben viele Angaben über den Anbau von Pflanzen auf dieser Siedlung geliefert, namentlich verbrannte Getreidekörner und ihre Abdrücke auf Tongefäßen, Werkzeuge, die der Ernte und der Bearbeitung von Zerealien dienten, Lagerungsgefäße und andere Gegenstände. Daten über die Pflanzen, die im Inkermantal angebaut wurden, wurden auch erhalten. Zusammen weisen diese Belege darauf hin, dass der Getreideanbau eine wichtige Rolle in der Wirtschaft der Krim an der Wende der Bronzezeit zur Eisenzeit spielte. Translation by Madeleine Hummler

Stichworte: Spätbronzezeit, Früheisenzeit, Getreideanbau, Krim, Uch-Bash

https://doi.org/10.1017/eaa.2025.10014 Published online by Cambridge University Press