

## PRELIMINARY RESULTS OF THE STUDY OF TWO LATE CHALCOLITHIC SETTLEMENTS IN THE GARABAGH STEPPE

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**Received:** 14.03.2025; **Revised:** 22.04.2025; **Accepted:** 15.05.2025

### Abstract

During June-August 2022 and October-November 2024, the first and second field campaigns of the Lower Garabagh Research and Excavations Project were conducted. The work was carried out on three Late Chalcolithic settlements (dating to the first half of the 4th millennium BCE): Leylatepe, Janavartepe, and Sarijali 2. The work at Sarijali 2 confirmed that the site had been destroyed. Work at Leylatepe and Janavartepe revealed a complex stratigraphy and rich material culture assemblages, demonstrating the significant differences between the two nearby settlements. This article summarises the initial results of our work since the summer of 2022.

**Keywords:** *Late chalcolithic period, Leylatepe cultural phenomenon, Bronze Age; Kura-Araxes culture, Bedeni culture, Leylatepe, Janavartepe, Cretulae*

*This article is dedicated to the memory of Tufan Akhundov, a scholar, a great man and a friend.*

### INTRODUCTION

The Late Chalcolithic Leylatepe phenomenon (first half of the 4th millennium BCE) of the Southern Caucasus has intrigued archaeologists for several decades (Narimanov *et al.*, 2007; Sagona, 2017). However, the phenomenon associated with the Near Eastern and North Caucasian cultures is not adequately defined chronologically and in terms of material culture. Our project was launched to systematically study the material culture of late prehistoric societies of the Garabagh Steppe.

During June-August 2022 and October-

November 2024, the first and second field campaigns of the Lower Garabagh Research and Excavations Project (LKREP) were conducted. The 2022 season, undertaken on behalf of the German Archaeological Institute and the Institute of Archaeology and Anthropology of Azerbaijan and supported by the German Research Foundation, was directed by M. Iserlis and Kh. Almamedov, with the assistance of M. Aghalarov, A. Qasimov, E. Babazade, G. Maurer, N. Mammedli, K. Hruby, and S. Hasanov (area supervision, environmental team, finds processing and administration). Students

from Azerbaijan and paid labourers from the village of Khindiristan (*Xındırstan*) and the Jalilabad District participated in the excavation. G. Iskenderova and M. Mamedova hosted the expedition.

S. Hasanov and S. Aliyev (administration), M. Aghalarov, A. Qasimov, K. Hruby (area supervision), J. Krumnow (survey), and K. Radezky (restoration) assisted in the 2024 season. Paid workers from the Jalilabad District and Khindiristan participated in the field and post-excavation work. S. Gulmalieva hosted the expedition.

This report presents the preliminary results of our fieldwork and special studies conducted between June 2022 and February 2025.

## RESULTS

### Fieldwork, Summer 2022 and Autumn 2024

Three mounds located close to each other were selected as potential excavation sites (Fig. 1). Janavartepe (*Canavartəpə*) is a mound with a

diameter of ca. 100 m and a height of up to 2.5 m, located on a terrace south of the dry river Shirkhangobusu (40°07'35.5" N, 047°09'56.0" E). Sarijali 2 (*Sarıcalı*) is a 1 m high hill in the middle of a plain, 1.6 km northeast of the village of Sarijali (Almammadov, 2016; 40° 09'13.5" N 47° 12'19.3" E). Leylatepe is a mound (2 m high and 50-60 m in diameter) located at the northern edge of the village of Eivazly (*Eyvazlı*), Aghdam region (Narimanov *et al.*, 2007; 40° 08'19.9" N, 47° 08'19.7" E), 2.6 km northwest of Janavartepe and 5 km southwest of Sarijali 2 (Almammadov & Iserlis, 2022).

The 2022 season lasted three months (June-August), during which we worked on three Late Chalcolithic sites. The 2024 season, which lasted almost two months (October-November), was focused on Janavartepe. The results of two field seasons, summer 2022 and autumn 2024, as well as our initial observations on specific aspects of material culture, will be briefly described below.

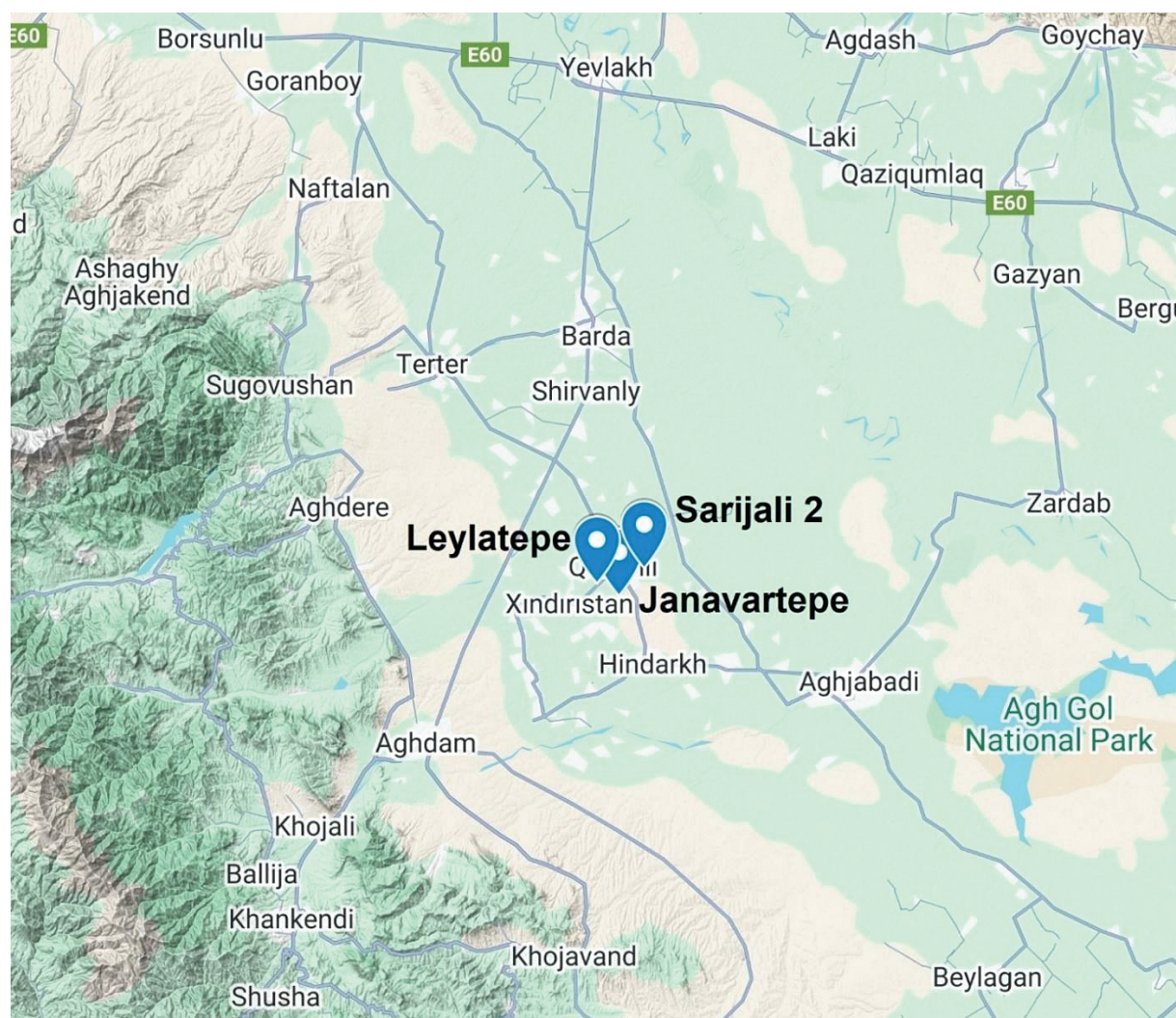


Fig. 1. Map (Google Maps). Location of Leylatepe, Janavartepe and Sarijali 2.



We started our 2022 field season in June at Janavartepe and Sarijali 2. The purpose of the soundings at Sarijali 2 was to assess the potential for possible work before the remains of the mound were completely ploughed up (Fig. 2). Our work revealed a rich pottery assemblage, stone tools, botanical remains, and animal bones without archaeological context. We, therefore, completed the work at Sarijali 2 and refilled the excavation trenches. At the end of the first week of July, we were able to start work at Leylatepe.

Leylatepe was excavated between 1984 and 1990 by Ideal Narimanov (Fig. 2; Akhundov, 2007; Narimanov, 1985; Narimanov *et al.*, 2007). Four “architectural horizons” with depths ranging from 1.55 to 1.65 m were defined in a trench measuring 324 m<sup>2</sup>, excavated in the southeastern part of the site (Narimanov *et al.*, 2007). In the 1990s, the soil from the excavation trench was used as construction material and filled with garbage. Later, an orchard was planted, and a restaurant with pavilions was built on the hill, making it challenging to identify the location of the Narimanov excavations. The results of the excavations at Leylatepe were partially published, and its dating is based on a single sample derived from an unclear context (Korenevskii, 2011, p. 33; Abu Jayeab *et al.*, 2023).



Fig. 2. Sarijali 2, aerial photo. Looking to the east.

The basic aim of our fieldwork in 2022 was to identify the remains excavated at Leylatepe in the 1980s. The 2022 excavation season at Leylatepe was conducted in five trenches: the western (IN-A), west-central (IN-L), northern (A1 and A2), and east-central (TA) parts of the mound. Two trenches (IN-A and IN-L) were opened in the western part of the mound to determine the outline of the Narimanov excavation and identify the architectural remains explored in the 1980s. We opened our trenches in this part of the site based on the information from Tufan Akhundov and our visual observations. The

recovery and identification of the remains excavated by Narimanov made it possible to establish a stratigraphic link between the old and the renewed excavations.

Six strata were defined in Areas IN-A and IN-L: modern Strata 1 and 2 and Late Chalcolithic Strata 3-6. Our Strata 3 and 4 correspond to Narimanov's Horizons 3 and 4. The four Late Chalcolithic strata consist of frequently changing settlement layers with rectangular mudbrick structures of different orientations, pits, and hearths (Fig. 3). In Stratum 5 in Area IN-L, a two-chamber pottery kiln (1.8 m in diameter) was revealed (Fig. 4). The internal layout and function of the rooms had changed entirely in Stratum 4. However, the general orientation of the walls has been preserved (Fig. 3). Stratum 3 includes two phases and comprises rectangular structures, shallow hearths (0.04-0.16 m deep and 0.35-0.65 m in diameter), three postholes (0.3 m deep, 0.1-0.2 m wide) and a storage pit. Strata 2 and 1 mark the modern waste disposal in the Narimanov trench (Stratum 2) and the construction activities related to the restaurant with a garden.

In Area TA, located east of IN-A and IN-L, we expected to find undisturbed contexts of uppermost settlement phases corresponding to Narimanov architectural horizons 1-3. The stratigraphy in Area TA includes three local layers: topsoil, Stratum 1, and Late Chalcolithic Strata 2 and 3. The Late Chalcolithic strata in Area TA comprise of open areas with corners of two rectangular mudbrick houses, pits, and pottery concentrations (Fig. 5). In their brief description of the stratigraphy of the site, Narimanov *et al.* (2007: 9) mentioned that horizon one was almost destroyed by plowing to a depth of 0.4-0.5 m. In Area TA, below a topsoil layer of 0.10-0.15 m, a restorable storage jar was discovered in situ, indicating the presence of the uppermost Late Chalcolithic layer.

Two 5 x 5 m squares (Area A) were opened to explore the settlement's northern edge. We expected to find undisturbed contexts of the upper settlement phases in this area, which correspond to Narimanov's “architectural horizons” 1-3. The local Stratum 3 consists of a series of dark ashy layers with concentrations of pottery sherds, pit-like features, postholes, grinding stones, and accumulations of animal bones. In the southwestern part of Area A, remains of a wall were documented. Twenty-one per cent of the cooking vessels and less than 5% of the non-cooking vessels found in secure contexts at Leylatepe in 2022 originated from Stratum 3 in Area A.





**Fig. 3.** Leylatepe, Area IN-A, looking to the southwest. Stratum 6 (pottery sherds and burnt material, upper left); Strata 4 and 3 (walls in the centre, on top of earlier wall, pit and rounded installation). Note the density of the layers (centre), 20th-century mixed garbage in the southern part of the section (upper left) and 20th-century backfill in the section (upper centre and right).



**Fig. 4.** Leylatepe, Area IN-L, looking to the south. Pottery kiln. Note the 20th-century mixed backfill in the section.



**Fig. 5.** Leylatepe, Area TA, looking to the southwest.

Our work in Leylatepe yielded the most remarkable results, including the clarification of the settlement's stratigraphy and the investigation of rectangular mudbrick houses and a two-chamber pottery kiln.

Three excavation areas were opened at Janavartepe: Area A at the southeastern edge and Areas B and C in the northwestern part of the mound (Fig. 6). The southeastern part of the mound was heavily damaged by bulldozers to a depth of 2.3 m. In this part of the mound, Area A, our goal was to document the layers and understand the stratigraphy. A 15 m long section face was first cleared, and a trench was excavated back from the face of the section. The sounding revealed a dense stratigraphic sequence, including Strata 4-2 from the Late Chalcolithic period and Stratum 1, dated to the Late Bronze Age-Early Iron Age period. Two rounded dugouts were constructed in Stratum 4, and the area was carefully plastered. Dugout 3217 includes three parts: a large room (diameter of 3.45 m), a smaller room (diameter of 2.8 m) to the east of it, and a bell pit (1.2-1.7 m) to the north-east (Fig. 7). Piles of mudbricks, mixed with clay installation fragments, animal bones, bone tools, groundstone, and pottery fragments were found on the floors of the rooms. Fragments of *cretulae*, stamped clay lumps used to seal containers and doors (Figs. 10, 8; Frangipane *et al.*, 2007), were found in this destruction debris, together with deer antlers. Structure 3237, located north of Structure 3217, comprises two rooms (with diameters of 2.5 m and 1.7 m). This dugout contained pottery sherds, stone artefacts, animal bones, and several *cretulae* fragments. Stratum 3 structure 3217 was sealed with a clay layer, and rounded structure 3026 was built on top of it. The area was abandoned for some time, leaving behind a layer of washed mudbrick material mixed with organics. Later in the Late Chalcolithic period, an infant burial was inserted into this layer. More than two thousand years later, two Late Bronze Age-Early Iron Age burials were made in Area A, which cut through the Late Chalcolithic remains.





**Fig. 6.** Aerial view. Areas C and B are located in the northwestern part of the mound (upper left), while Area A is in the southeastern part (bottom right).



**Fig. 7.** Janavartepi 2024, Area A, aerial view. Large dugout 3217 (centre) with collapsed mudbricks and destruction layer in two rooms, smaller dugout 3237 to the north (upper part of the photo), and two pits (bottom).





**Fig. 8.** Janavartepe 2022, Area C, looking to the west. Oval dugout in the north (right) with a rounded clay installation and a rounded dugout in the south (left). Note the uppermost floor surface (east) and one of the lower floors (west) in the oval structure.



**Fig. 9.** Janavartepe 2024, Area B. Late Chalcolithic infant burial in cooking pot, covered with large sherds (front). Note the animal burrow channel that destroyed another burial to the east.

In Areas B and C, located northwest of area A, seven strata were defined: Late Chalcolithic Strata 7-5, Early Bronze Age Stratum 4, Middle Bronze Age Stratum 3, Late Bronze Age Stratum 2 and Stratum 1, comprising traces of activities from the late Medieval period to the 20th century (Figs. 8, 9). Stratum 7 (Fig. 8) includes two dugout structures, a rounded clay installation, and remains of a mud plaster floor. The oval dugout in the north included an antechamber with an infant burial in the cooking pot. The structure was furnished with fireplaces and a pillar base in the central part. Rounded clay installation was built at the exterior of the wall in its south-western part (Fig. 8). We were able to describe three main use phases in the structure, defined by floor surfaces with fireplaces (Fig. 8). In contrast to the rounded dugouts at Janavartepe, a minimal quantity of pottery sherds and animal bones was found in this structure. An additional deep dugout of two rooms was found south of the oval structure. The dugout's large room (2 m in

diameter) has two distinct use phases, characterised by a rich assemblage of pottery, stone artefacts, and animal bones. In the western part of Area B, a small elongated structure was uncovered, with a rounded wall and an open area to the south and east. The structure builders excavated a shallow, irregularly shaped depression of 0.08 m and built a mudbrick wall along the outline of the pit. The area was abandoned for a period (Stratum 6) and later utilised for Late Chalcolithic infant burials (Stratum 5; Fig. 9), which were cut into Strata 7 and 6.

In Areas B and C, three Kura-Araxes (Stratum 4) and three Bedeni burials (Stratum 3) were documented (Fig. 9). An Additional burial, dated to the Late Bronze period, was excavated in the eastern part of Area B.

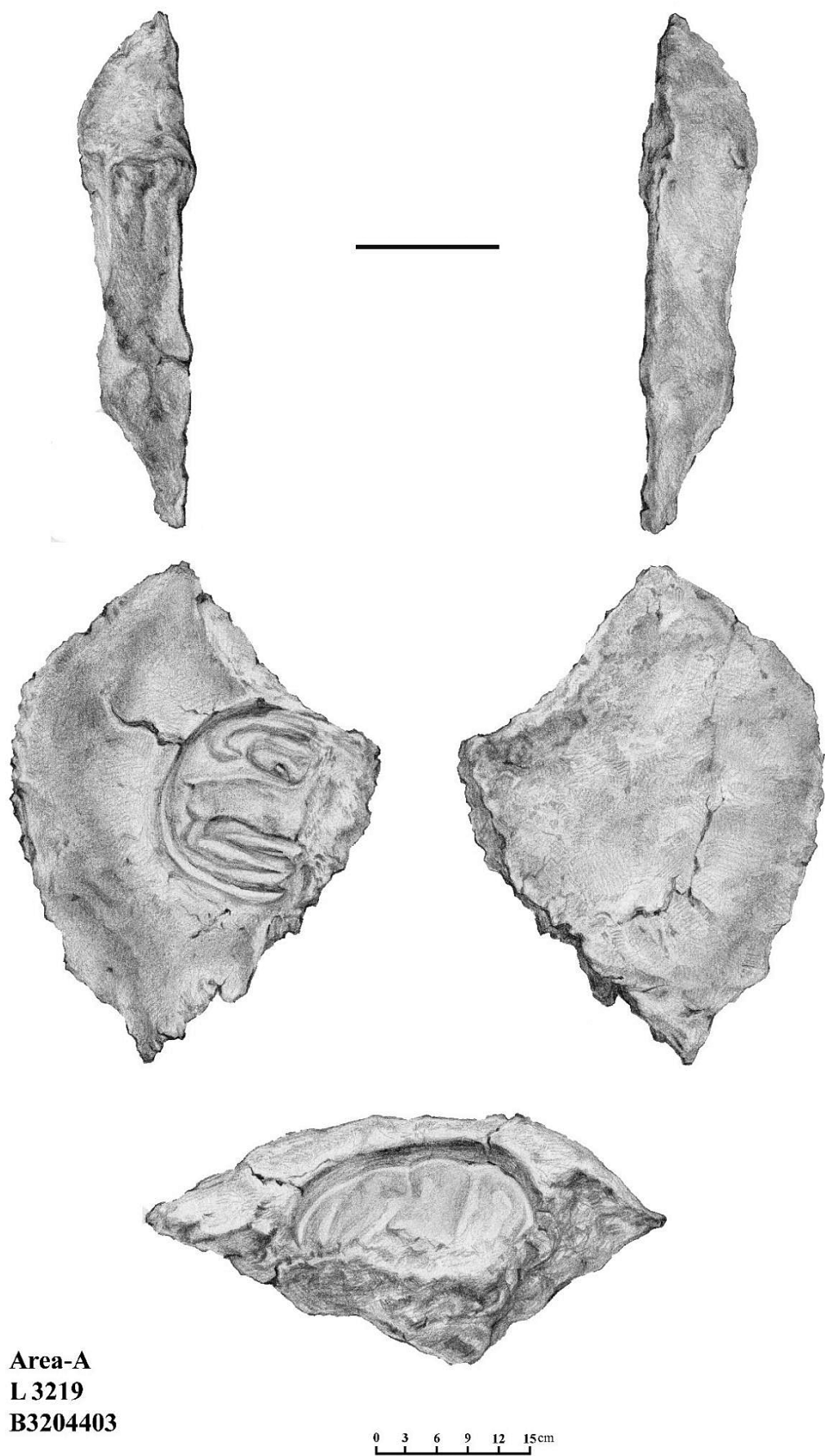
### The Late Chalcolithic Pottery Assemblages

The pottery assemblages of the three sites include bowls, deep bowls with sinuous walls, small globular jars, jars, vats/basins, *pithoi*, cooking pots, and very rare skillets. Several twin jar fragments were found at Leylatepe and Janavartepe. Bowls constitute more than 40% of the Leylatepe non-cooking assemblage. At Janavartepe, bowls constitute about 25% of the non-cooking vessels.

The Leylatepe assemblage was divided by Narimanov *et al.* (Narimanov *et al.*, 2007, pp. 37-39) into three main paste (Russian: *формовочная масса*) groups: (1) fine clay without temper or minimal content of fine sand; (2) fine clay with added fine-chopped vegetal material; and (3) clay with added grus/grit and coarse sand. Rarely were both sand and vegetal temper added.

From the typological and functional standpoints, the ceramic assemblages of the three settlements consist of two main components, typological functional groups: (a) Homogeneous non-cooking pottery and (b) Heterogeneous kitchen pottery with sooted surfaces. The so-called "Sioni" combed vessels (group (c) (Sagona, 2017) constitute 1-7% of the assemblages. Additional components of the assemblages, both at Leylatepe and Janavartepe, are very rare black and/or brown burnished closed vessels. The fragmentary preservation of these pots does not allow us to describe their complete profile; however, during two seasons of excavation, we did not find any open vessels.





Area-A  
L 3219  
B3204403

Fig. 10. Cretula.

Based on first-hand observations, four main wares were defined at Leylatepe and Janavartepe:

*Ware 1.* Fine whitish-pink, beige, and rarely pale brown clay without vegetal temper, without or with very rare visible grit temper; slipped, nicely smoothed, mostly polished, and rarely slightly burnished; sections without cores. Shallow grooves parallel to the neck and base are marked on the inner and/or outer surfaces of 70% of the items. Bowls and jars of the typological-functional group (a) belong to this ware. Less than 10% of the registered indicative sherds belong to this group. The group is identical to group (1) defined by Narimanov *et al.* (2007);

*Ware 11* (group (2) of Narimanov *et al.*, 2007) is almost identical to *Ware 1* regarding clay but contains vegetal material and some large mineral grains. Seventy per cent of diagnostic sherds and vessels belong to this ware. The clay is delicate, ranging from whitish-pink to greenish-white, beige, and rarely pale brown or reddish-brown. The vessels are slipped, well-smoothed or polished, and sometimes burnished. Shallow grooves parallel to the neck are marked on the inner and/or outer surfaces of 40% of the sherds that belong to the ware. These were produced in a full range of non-cooking vessels of typological-functional group (a): bowls, globular pots, jars, basins/vats, and *pithoi*. Most jars, *pithoi*, and vats/basins sections exhibit dark grey to black cores.

Some of the vats were intensively burnished on the exterior, and others were also burnished on the interior and fired to a red colour. This small group

of vessels ( $n = 10$ , 3% of total sherds) is defined as *Ware 11a*;

*Ware 2.* Coarse dark grey to dark brown, sometimes red clay with coarse sand, and with or without vegetal material temper; the vessels are mainly slipped and well smoothed or polished. The ware includes necked cooking pots and rare skillets of the typological-functional group (b);

*Ware 3.* Coarse grey to brown clay with grit temper; slipped, smoothed, or slightly polished. The exterior surfaces and upper interior are combed (typological-functional group (c). Only so-called “Sioni” jars belong to this ware.

Typological-functional group (a) is associated with *Wares 1* and *11* and characterised by standardised clay type, temper, simplified morphology, and wheel-finishing marks. Typological-functional groups (b) and (c) are associated with *Wares 2* and *3*, respectively.

Seventy-seven diagnostic vessels from Leylatepe were petrographically analysed (Iserlis, 2019). Four fabric groups (A, AA, B, and C) were identified based on the relative quantities of minerals and evidence for the intentional manipulation and treatment of the raw material.

The key clay groups are indicated by uppercase letters, to which numerals indicating different types of inclusions may be added (2 – vegetal material, 3 – grog, 6 – added limestone sand, 17 – granite/granitoid sand). Table 1 and Fig. 12 summarise the main results of the petrographic analysis.

**Table 1.** Leylatepe. Distribution of sampled vessels according to Fabrics

Fabric/Type	A17	A2-17	A3-17	AA6-17	B	B2	B2-17	B2-6-17	B2-3	Bb2	BB	C	C2	Cc2	Total
Bowl						6	1	1	1	24		2		1	36
Beaker										1					1
Basin/Vat										3				1	4
Jar					1	1		1		12	1		1		17
Pithos										4			1		5
Combed “Sioni” Jar				5											5
Brown-Black Burnished Jar		1													1
Total	0	1	0	5	1	7	1	2	1	44	1	2	2	2	69
Cooking pot	2	5	1												8
<b>Total</b>	<b>2</b>	<b>6</b>	<b>1</b>	<b>5</b>	<b>1</b>	<b>7</b>	<b>1</b>	<b>2</b>	<b>1</b>	<b>44</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>77</b>





Fig. 11. Cooking pot.

The morphological, petrographic, and technological analysis of the pottery shows a clear segregation in raw materials, construction techniques, and surface treatment methods between different typological-functional groups and wares (Iserlis, forthcoming):

1) The producers of non-cooking vessels (*Wares 1 and 11*) used only clays of groups B and C (Table 1). The producers of these vessels added mainly vegetal temper (87%,  $n = 55$ , of the sampled non-cooking vessels); vegetal temper, limestone, and granitoid sand; vegetal and granitoid sand, and very rarely, vegetal material and grog. Only 6% ( $n = 4$ ) of the sampled vessels in the group were produced using clay without added temper.

2) All cooking pots (*Ware 2*) were made from local soil A (Fig. 11). Temper was constantly added to the clay: vegetal material and granitoid sand (5 of 8); granitoid sand (2 vessels) or grog and granitoid sand (1 item).

3) Producers of combed "Sioni" jars (*Ware 3*)

used only one Fabric (AA6-17) that was not used by potters of typological-functional groups (a) and (b). The calcareous clay and mixed limestone-granitoid temper strongly distinguish the choices of Sioni potters from the non-cooking and cooking vessel producers (Table 1 and Fig. 12).

**The Ground Stone Tools.** The two seasons of excavations at Janavartepe and one at Leylatepe yielded 370 ground stone tools and tool fragments. Of these, approximately one-third of the artefacts were found in topsoil and disturbed contexts ( $n = 81$ ) or within mixed Bronze Age–Middle Age strata that sealed the Late Chalcolithic remains at Janavartepe ( $n = 41$ ). However, most of the tools ( $n = 248$ ) were retrieved from the Late Chalcolithic layers of both settlements.

The Late Chalcolithic ground stone tool assemblage comprises mostly tools and fragments found at Janavartepe ( $n = 188$ , 75.8%), which has been more extensively excavated to date, and the remaining 60 artefacts (24.2%) were found at Leylatepe. The tools were made of primarily volcanic materials ( $n=150$ , 60.5%). The use of sedimentary rocks is significantly less frequent ( $n = 71$ , 28.6%), with limestone (19.0%) being the most common among these. Metamorphic raw materials ( $n = 8$ , 3.2%) are sporadically present in the assemblage, and in six cases, the origin of these raw materials remains unclear. The preference for volcanic rocks and basalt, mainly, is even more pronounced at Leylatepe (71.7%), while the variety of raw materials at Janavartepe is slightly higher.

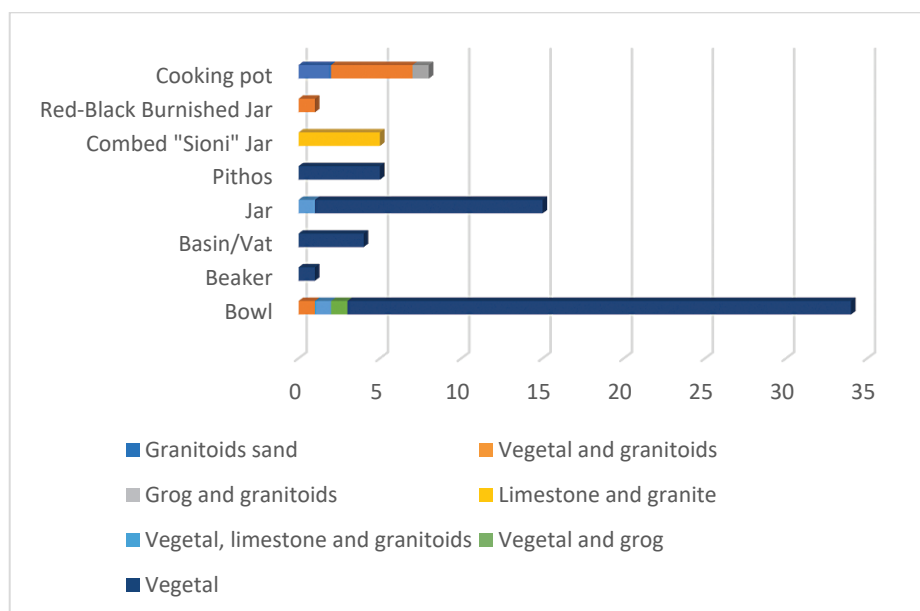
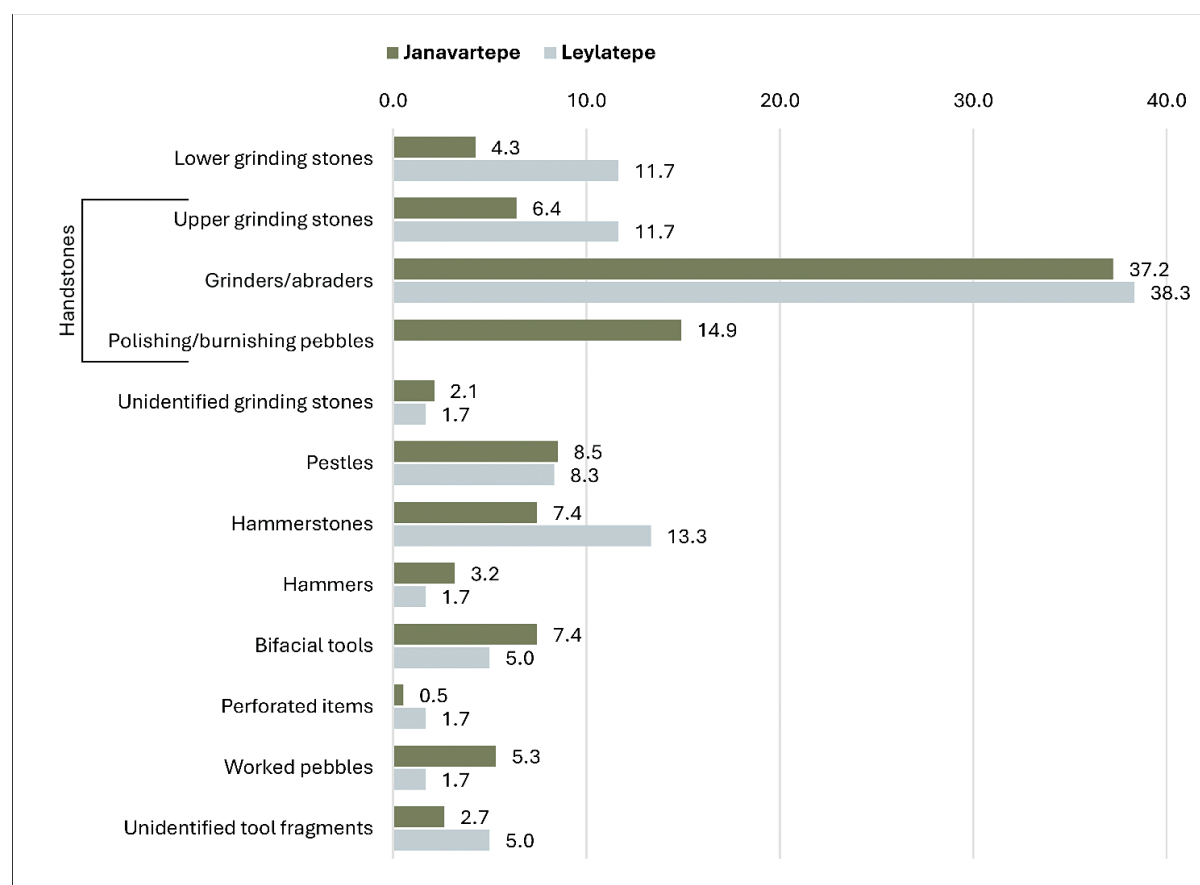


Fig. 12. Leylatepe. Distribution of sampled vessels according to temper types.



**Fig. 13.** Frequencies of ground stone tool types at Janavartepe and Leylatepe.



**Fig. 14.** Two large upper grinding stones found *in situ* in the central dugout in Area A, Janavartepe.

The tools were grouped into technomorphological categories (Fig. 13), including lower grinding stones (passive grinding implements,  $n=15$ , 6.0%) handstones (active grinding, abrading, or polishing/burnishing tools,  $n = 140$ , 56.5%), pestles ( $n = 21$ , 8.5%), hammerstones and elongated hammers ( $n = 29$ , 11.7%), bifacial tools (axes, adzes, chisels and bifacial discs,  $N=17$ , 6.9%), perforated items ( $n=2$ , 0.8%), worked pebbles ( $n = 11$ , 4.4%), and unidentified grinding stones fragments ( $n=5$ , 2.0%) and other unidentified tool fragments ( $n=8$ , 3.2). Both at Janavartepe and Leylatepe, the

assemblage exhibits a prevalence of grinding, abrading/polishing, and percussion tools (91.6%; Fig. 14), while perforated items appear incidentally (single limestone perforated weights at each site), and stone vessels are absent from the Late Chalcolithic strata.

### Zooarchaeology, Janavartepe 2022

The initial zooarchaeological analysis at Janavartepe focused on taphonomy, species and elemental identification, fusion data, dental wear, and measurements. Additionally, two teeth were analysed for sequential stable oxygen and carbon isotopes.

The Late Chalcolithic zooarchaeological assemblage from Janavartepe is dominated by domestic taxa, amongst which caprines are the most frequent, followed by cattle. Pigs are present in small quantities. Sheep significantly dominate over goats at Janavartepe. Wild ungulates account for a small amount of the identifiable assemblage, consisting of gazelle and deer (2.6%). Overall, Janavartepe exhibits a mixed herd composition, with a focus on livestock and a small number of equids. Hunting played a minor role at the site.



**Table 2.** Janavartepe 2022, taxonomic abundance

Taxa	NISP*	NISP %
<b>Domesticated Ungulates</b>		
<i>Bos</i>	33	22
<i>Sus</i>	9	6
<i>Ovis/ Capra</i>	58	39
<i>Ovis</i>	38	26
<i>Capra</i>	11	7
<b>Domestic sub-total</b>	<b>149</b>	<b>100</b>
<b>Wild Ungulates</b>		
<i>Gazella</i>	2	1.3
<i>Capreolus capreolus</i>	1	0.6
<i>Cervidae</i>	1	0.6
<b>Wild ungulate sub-total</b>	<b>4</b>	<b>2.6</b>
<b>Canines</b>		
<i>Canis</i>	1	0.6
<b>Total identifiable</b>	<b>154</b>	<b>100</b>
<b>Body size category</b>		
Large bovid/cervid	3	
Medium bovid/cervid	73	
Small bovid/cervid	9	
Large bovid	2	
Medium bovid	1	
Large mammal	31	
Medium mammal	10	
Small mammal	2	
<b>Body size sub-total</b>	<b>131</b>	
<b>Total</b>	<b>285</b>	<b>100</b>

**Archaeobotany, Janavartepe 2022**

During the 2022 excavation season, 52 environmental samples, totalling approximately 1,470 litres of sediment, were recovered from Janavartepe. G. Maurer and N. Memmedli processed all the samples on-site.

Of the entire assemblage, 14 samples (approximately 26%) were sterile. The remaining 38 samples produced 1,067 seeds, seed fragments, post-processing waste (chaff), and food remains. Of these, 840 specimens (around 78%) were categorised as indeterminate—fragmented cereals and arable weeds lacking identifiable features. Overall, the assemblage is predominantly composed of cereals, followed by arable weeds, with a small quantity of other edible plants and food remains.

The dominant crop in the assemblage is barley

(*Hordeum vulgare* L.), including naked barley (*Hordeum vulgare* L., var. *nudum*) and indeterminate barley (*Hordeum vulgare* L., sensu lato), followed by various varieties of wheat. The wheat category is primarily represented by free-threshing wheat (FTW) (*Triticum aestivum/durum*), with smaller quantities of Timopheev's wheat (*Triticum timopheevi* Zhuk) and indeterminate wheat (*Triticum* spp., L.). Aside from two glume wheat fragments and two spikelet fragments, no chaff was found in the analysed contexts.

**Table 3.** Presenting the summary of food crops, including the glume fragments\*

Presence	Sum
<i>Cereal</i>	
Naked barley	41
Barley indeterminate	39
Free-threshing wheat	40
Timopheev's wheat	6
Cerea fragments indeterminate*	803
Total cereal	923
<i>Other edible plants</i>	
Melon	2
Egyptian cucumber/sponge gourd	1
Cucurbits fragments indeterminate	3
Total other edible plants	6
Total food crops	929

Among the wild weed species, likely arable weeds, the most common are small grass fragments (*Poaceae* L.); a few grains of *Chenopodium* L. and *Gallium* L., both native to the region. The high number of unspecified and fragmentary seeds is likely due to poor preservation, potentially caused by fire (evidenced by heavily burnt seeds) and other post-depositional processes.

Of particular interest is the absence of legume species, which have been found in other known assemblages from Late Chalcolithic or transitional (LC to EBA) sites in the Caucasus, such as Areni-1, Godedzor, and Ovchular Tepesi (Hovsepyan *et al.*, 2015). This absence could be due to a lack of inter-crop storage practices, crop storage seasonality, or an early stage of the later observed trend of complete renunciation of legume cultivation. The lack of pulses in the archaeobotanical record was observed in the Early Bronze Age assemblage,

\* Note: NISP — Number of Identified Specimens (refers to the total count of all bones or bone fragments).

which was preceded by the gradual decline of pulse cultivation throughout the Chalcolithic period (Hovsepyan *et al.*, 2015).

Noteworthy are the findings from the Cucurbitaceae family: two melon seeds (*Cucumis melo* L.), one Egyptian cucumber/sponge gourd seed (*Luffa cylindrica* L.), and three fragments of indeterminate cucurbits. Melons may have originated during the Bronze Age in the Indus Valley or even earlier in predynastic Egypt (Fahmy *et al.*, 2011; Wengrow *et al.*, 2016). The origin of the Egyptian cucumber/sponge gourd is still under investigation, though it is likely a cultivar from the tropical regions of Southeast Asia or North Africa.

Fragments of food remains have been found within the assemblage, and they are currently being analysed to determine their food category.

### Radiocarbon Dating

Thirty samples from different strata of the two studied sites, 12 from Leylatepe and 18 from Janavartepe, were selected for radiocarbon dating. The initial results of data modelling for Leylatepe indicate that the Late Chalcolithic sequence began around 4000 cal BCE, representing one of the earliest currently known occurrences of Leylatepe communities (Fig. 15a). The settlement appears to have ended after 3800 cal BCE.

The settlement at Janavartepe began slightly later, shortly after 4000 cal BCE, and overlapped with Leylatepe for some time (Fig. 15b). The latest Chalcolithic layers indicating a later reuse of the settlement, date roughly to 3600–3400 cal BCE, aligning with the transition from the Late Chalcolithic to the Early Bronze Age, associated with appearance of the Kura-Araxes

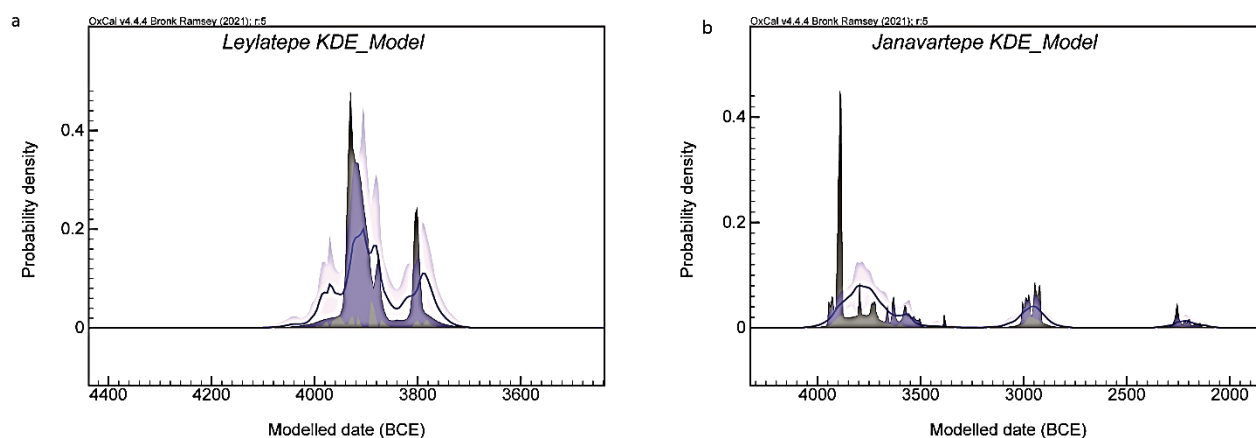
communities. Early Bronze Age burials at Janavartepe have been dated to 3000–2900 cal BCE. One of the Bedeni burials was dated to 2300–2150 cal BCE. Two more dates from the Common Era originate from Strata 2 and 1 in the northern part of Area C.

**Burials and physical anthropology.** Eight tombs were discovered at Janavartepe during the 2022 field campaign (L2009, L2010, L2015, L2023, L2024, L2078, L2085, L2090). The archaeo-anthropological study of the burials initially focused on the biological analysis of the skeletons, including sex determination, age-at-death estimation, dental health assessment, and the identification of bone pathologies.

All burials are individual except for L2023. In total, 11 individuals were analysed (Table 3): one adult, one older adolescent, and nine immature individuals, including two who died in the perinatal period.

Bone samples from each individual were collected for radiocarbon dating and isotopic analyses, which are currently underway (conducted by Estelle Herrscher, CNRS, France). Burials from the Late Chalcolithic, Early Bronze Age (Kura-Araxes culture), and Middle Bronze Age (Bedeni culture) were analysed.

Analysing funerary practices will provide insights into burial modes and body positions. However, the Janavartepe burials are exceptional in terms of their chronology. Until now, primary individual burials from the Kura-Araxes and Bedeni periods were unknown in this region.



**Fig. 15.** Kernel density plots for the Late Chalcolithic and Bronze Age periods from the (a) Leylatepe and (b) Janavartepe.



**Table 4.** Burials at Janavartep, 2022.

#	Burial Number	Period	Adult/Immature
1	L2090 B20157	Early Bronze Age	Adult
2	L2085 B20162	Late Chalcolithic	Immature
3	L2010	Late Chalcolithic	Immature
4	L2015	Late Chalcolithic	Immature
5	L.2023 B. 20031.01	Early Bronze Age	Immature
6	L.2023 B20031 Individual C	Early Bronze Age	Immature
7	L.2023 B20031 Individual A	Early Bronze Age	Immature
8	L2023 B520031 Individual B	Early Bronze Age	Immature
9	L2078 B20124	Bedeni	Adolescent
10	L2024	Late Chalcolithic	Immature
11	L2009	Bronze Age?	Immature

## CONCLUSIONS

Leylatepe and Janavartep are geographically close (2.6 km) and are part of the same cultural phenomenon. They have coexisted for some time, but have different characters. The layers of the 40th to 38th centuries BC (cal. 4010-3760 BC) at Leylatepe consist of frequently changing settlement layers with rectangular mudbrick structures, plastered surfaces, food preparation areas, pits, and a two-chamber pottery kiln. The Late Chalcolithic Janavartep layers contain rounded dugouts, plastered surfaces, infant burials, and pits.

Impressions of at least seven seals were found in two dugouts at Janavartep, indicating that at least seven people performed administrative tasks and sealed goods. Who were these people? What was the nature of the relationship between these settlements?

Continuing our project will answer many interesting questions about the Leylatepe phenomenon and contacts with near and distant regions.

## ACKNOWLEDGEMENTS

We thank our workers, colleagues, students, and visitors. Without their work and advice, our work would not be possible. Special thanks go to Dr. Manson I. von Berghoffnung and Darcy Florance. The research has been supported by the Eurasia Department of the German Archaeological Institute and the German Research Foundation, Grant No. IS 312/3-1 ("Die Keramik des Maikop-Phänomens im archäologischen Kontext", Iserlis), Gerda Henkel Stiftung Grant AZ 39/V/24 ("Administration Practices in the Late Chalcolithic Southern Caucasus? High Resolution Excavations at Janavartep, Azerbaijan", Iserlis and Almamedov), Fritz Thyssen Stiftung Forschungsstipendium ("Maikop Phenomenon of the Northern Caucasus: Back to Basics", Iserlis), Minerva Fellowship of the Minerva Stiftung Gesellschaft (Hruby) and National Science Center of Poland Project UMO-2021/41/N/HS3/03939 ("Perennial plants in the Chalcolithic of the South-Western Asia. Domestication, cultivation, and commodification. The case of Gurga Chiya (Iraqi Kurdistan), Nippur (Iraq) and Tel Qedesh (Israel)", Joka).

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