



Revisit the Kura-Araxes: The Absolute and Relative Chronology of Qaleh Tepe and Ali Yourd Tepe, Zanzan Province, Iran

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The communities of the Kura-Araxes cultural complex with their highly distinctive cultural and economic features represent the occupation of some parts of the Near East and Caucasia during the Bronze Age. Generally, the origin of this culture is sought in the Southern Caucasus. In Iran, the spread of this cultural tradition represents not only a rupture in the cultural development of the Mesopotamian traditions. Environmental changes linked to Rapid Climate Change (RCC) also forced the population to develop new economic strategies. Until about two decades ago, knowledge of the flourishing Kura Araxes occupation was limited to the north-west of the country and to some parts of the Central Zagros, but recent research in the zones south and north of the Alborz Mountain Range, on the northern edge of the Central Plateau allows by now to present a more detailed picture of the Kura Araxes occupation in both diachronic and synchronic perspective. Recent archaeological excavations in the two sites of Qaleh Tepe and Ali Yourd Tepe revealed some important new data from Kura-Araxes settlements in the corridor of the north Central Plateau and northwestern Iran. The two sites are located in the eastern Zanzan Province in the Abhar Rood Basin. This paper aims to update the chronology of the Kura-Araxes culture based on the radiocarbon dates from the two sites of Qaleh Tepe and Ali Yourd Tepe. The stratigraphy and radiocarbon dates of the two sites reveal the beginning of the Kura-Araxes culture in the region from c. 2900 BCE, followed by a quick extension into the northern Central Plateau, where it is represented by sites such as Shizar, Doranabad, Ostur, and Barlekin. Similarity and diversity characterize the Kura-Araxes cultural complex. However, based on the current data, the ceramic style represents a common feature, but also the architectural remains indicate a common cultural tradition during the first quarter of the third millennium BCE in the Central Zagros, northwestern Iran, and on the Central Plateau.

Keywords: Kura-Araxes Expansion, Kura-Araxes Chronology, Central Plateau of Iran, Qaleh Tepe, Ali Yourd Tepe.

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1.Introduction

Over a period of about two millennia, Chalcolithic communities in the Central Zagros and the northwestern and northern Central Plateau of Iran instigated and witnessed fundamental changes in the development of craft specialization, long-distance communication, movement of craft goods and people and the administration of trade goods. This innovative period ended towards the end of the fourth millennium BCE with the introduction of a new social, economic and settlement system known as the Transcaucasian or Kura Araxes world (Renette and Mohammadi Ghasrian 2020, Sagona 2018, Matthews and Fazeli Nashli 2022). Antonio Sagona characterized the Kura- Araxes archaeological culture in his excellent work as follows:

There is no evidence of rigid hierarchy or political centralization. Instead, we have communities whose decision-making processes were collective and based on horizontal kinship networks. Emerging from the fuzziness of the Late Chalcolithic around 3500 BC, these south Caucasian groups stamped the following millennium with an imprint entirely their own (Sagona 2018, p. 213).

The Kura-Araxes core region presented a new cultural world strongly differing from the traditional hierarchical organization of the neighboring cultures of Maikop and the Mesopotamian Uruk societies. Within the Central Zagros to the northern Central Plateau, there was a tendency towards a vertical hierarchical social organization from the fifth to the fourth millennium BCE. This system shifted to greater heterogeneity (Fazeli Nashli et al 2021, Fazeli Nashli and Matthews 2021) afterwards as represented in Arslan Tepe and Shengavit (Rothman, 2021, Palumbi 2019). Shengavit was a small polity center but a kinship network to exert some controls and the data does not support a high level of hierarchy.

Previously, knowledge of the extension of the Kura-Araxes occupation in Iran was limited to the northwestern and Central Zagros regions (Roaf 1990, 80). Over the last two decades, archaeological investigations revealed new evidence regarding the presence of this cultural tradition over a much wider area of the Iranian Plateau, including the eastern Central Zagros (Abedi et al. 2014; Khaksar et al. 2015; Sharifi 2021), the northern slopes of the Alborz Mountains, and the northern Central Plateau of Iran (Fahimi 2005; Mousavi et al. 2007; Fazeli Nashli et al. 2022, Fazeli Nashli and Abbasnezhad 2005; Piller 2012; Fazeli Nashli et al. 2013) (fig. 1). These new findings have instigated some discussion about various aspects of the Kura-Araxes extension in Iran and their social components, including potential routes of communication and dispersal and internal chronology. But the evidence of the Kura-Araxes extension in Iran is mostly obtained from small-size excavations or regional surveys, which do not provide enough details about the Kura-Araxes sequence in various regions. In addition, the absolute radiocarbon dates are not available at all sites.

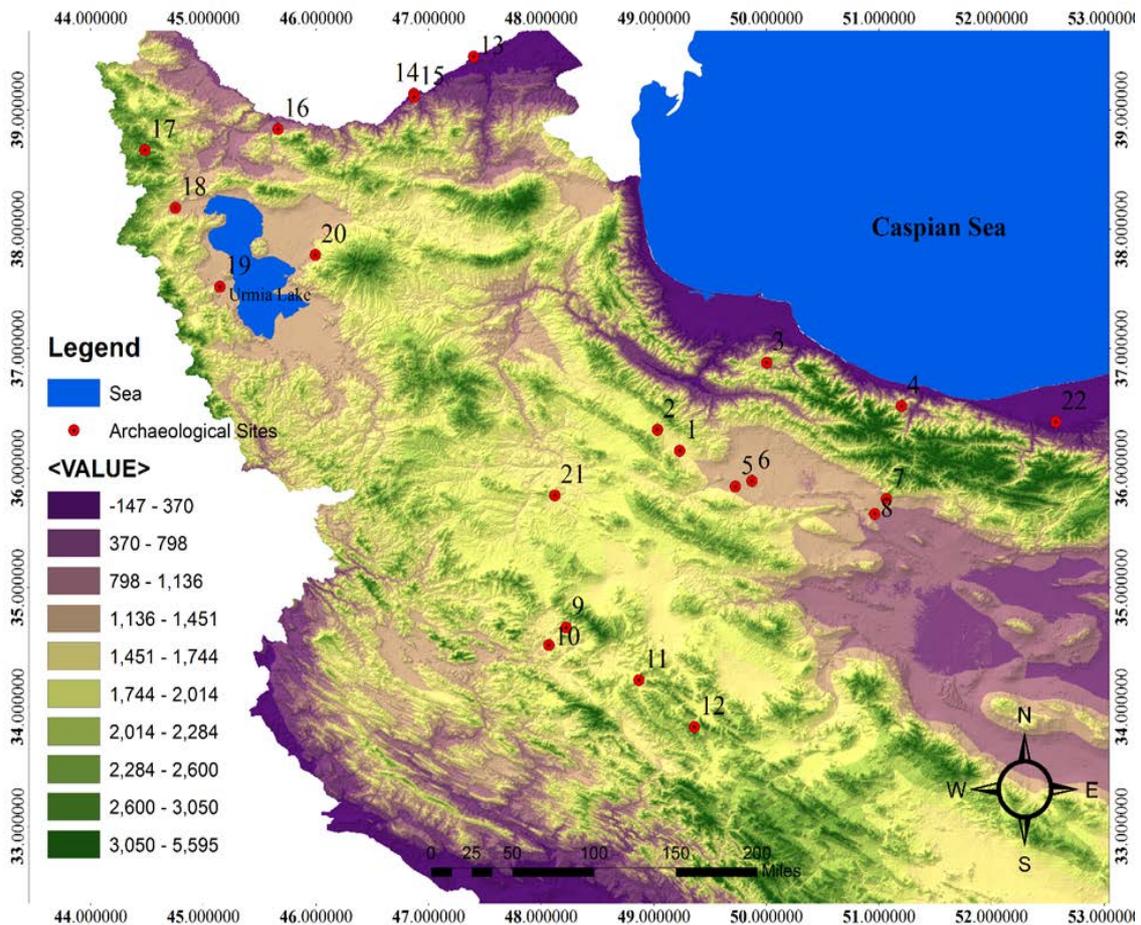


Fig. 1 Important Kura-Araxes sites in Iran: 1. Qaleh Tepe, 2. Ali Yourd Tepe, 3. Diarjan, 4. Taped Kelar, 5. Shizar, 6. Doranabad, 7. Tepe Ostur, 8. Barlekin, 9. Tepe Pissa, 10. Godin Tepe, 11. Tappeh Gourab, 12. Taped Qal'eh-ye-Sarsakhti, 13. Nadir Tepesi, 14. Kohne Pasgah Tepesi, 15. Kohne Tepesi, 16. Kul Tepe near Jolfa, 17. Kohne Shahar, 18. Haftavan Tepe, 19. Geoy Tepe, 20. Yanik Tepe, 21. Chal Tepe Pirtaj, 22. Ghal-e Ben (Map by H. Rostami)

The two sites of Qaleh Tepe and Ali Yourd Tepe in the borderlands between northwestern and central Iran provide important data for a relative dating of the Kura-Araxes occupation and these are corroborated by radiocarbon dates¹. This evidence is presented in the following. Both settlements can be characterized as small villages with a combination of farming and animal husbandry, showing no sharp social differentiation within and between villages. Located approximately 30 km apart from each other, the two sites inhabit a narrow plain in the eastern part of Zanjan province. Like a topographical corridor, this plain connects the northwest of Iran to the Central Plateau and can be considered the most likely route for the Kura-Araxes dispersal into north-central Iran.

2. The site of Qaleh Tepe and its excavations

The archaeological site of Qaleh Tepe (Lat. 36.0847°; Long. 49.1343°; Elevation c. 1540 m asl.) is located on the eastern edge of the modern City of Abhar. Urban development, land leveling and construction have destroyed large swaths of the site. Today, only a

1. Radiocarbon dating was carried out within the framework of project "ChronIran", granted to Barbara Helwing and Hassan Fazeli Nashli by the Fritz Thyssen Foundation, Germany. Samples were analyzed at the AMS lab of the Curt Engelhorn Centre in Heidelberg.

small part of the site's center with an area of about 1,000 square meters remains intact (fig. 2). Nevertheless, Qaleh Tepe was one of the large mounds in the region. It is situated on a low natural terrace on the southern side of the Abhar Rood, the most important river in the region, which flows in a northwest-southeast direction in the eastern part of a long and narrow plain. The first archaeological excavation at Qaleh Tepe was carried out by A. Mirfatah in 1993 (Mirfatah, 1993). Another excavation was directed by M. Asgarian in 2001 (Asgarian, 2001), and the last excavation was conducted by A. S. Naghshineh in 2011 (Naghshineh, 2017) and is reported in the following. All these excavations were limited in size, but they nevertheless provided evidence for Islamic, historical, and prehistoric occupation. Among these finds, the Early Bronze Age deposits are most interesting and significant.

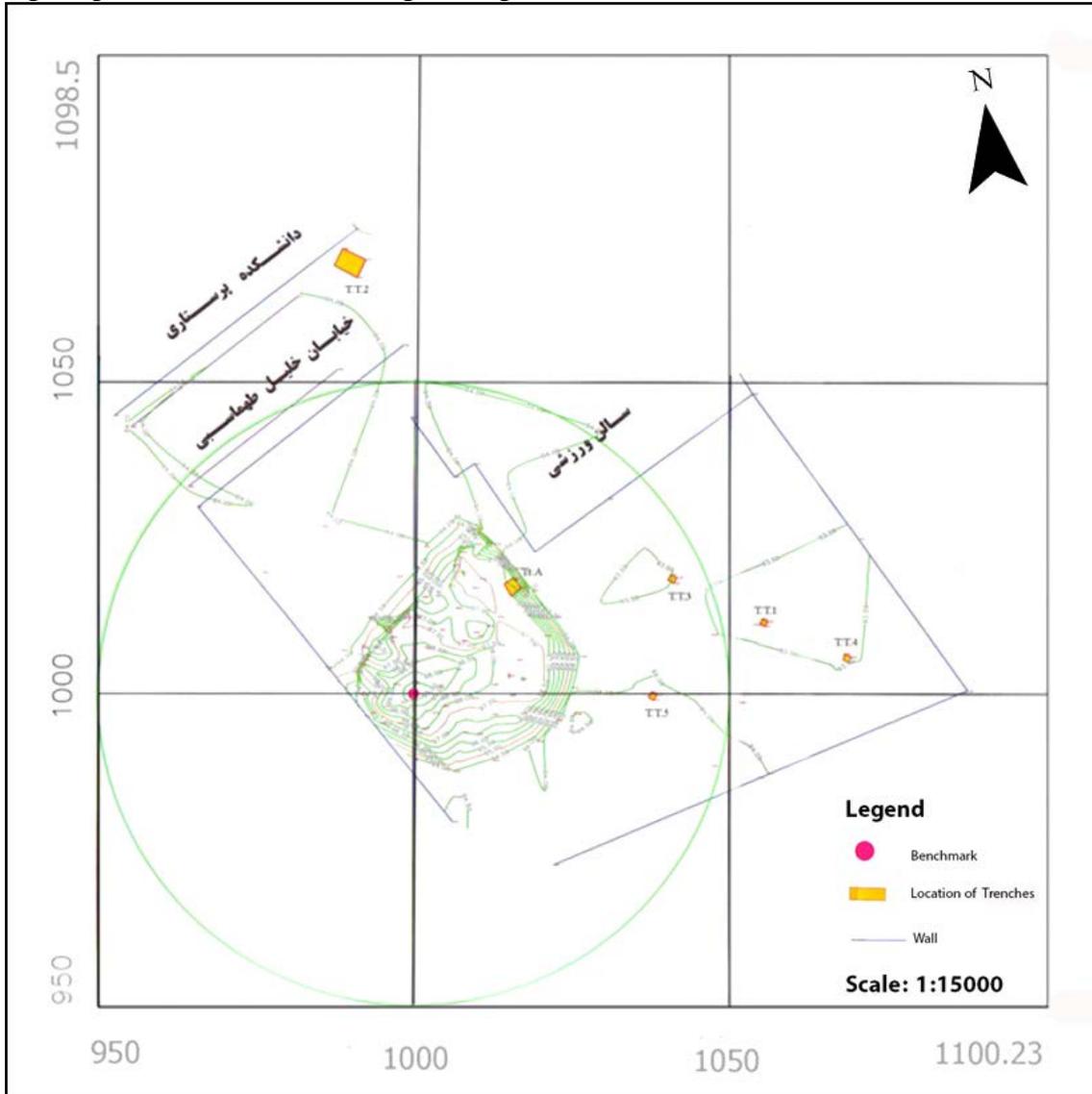


Fig. 2 Qaleh Tepe, Topographic map indicating the location of excavation trenches

In the 2011 excavation, a trench (trench A) in the center of the mound and five test trenches (TT. 1-5) in the leveled parts of the east and north were excavated (fig. 2). Trench A, with dimensions of 2x2 meters, was excavated for stratigraphic purpose on

Revisit the Kura-Araxes: The Absolute and Relative Chronology of Qaleh Tepe and Ali Yourd.. 207

the eastern part of the central part of the mound, which was formed by recent leveling activities in the site. The four test trenches 1, 3, 4, and 5, with dimensions of 1x1 meters, were opened in the leveled eastern part to reach the earliest occupation at the site and potentially Iron Age graves. Test Trench 2 was opened in the northern part of the site alongside a street built in this area. It was later enlarged to 3x4 meters to allow more insight into the Early Bronze Age remains.

In Trench A, 26 contexts (or stratigraphic units) were distinguished with a total depth of 322 cm (fig. 3). The upper contexts were disturbed and contained mixed material culture residues, mainly from historical and Islamic periods. The middle contexts were less disturbed and consisted of remains from the historical period, probably Parthian. The lowermost contexts were exposed only in the eastern part of the trench as a narrow strip on virgin soil. They belong to the first occupation phase during the Early Bronze Age. Occupation was limited to the eastern part of Trench A and did not extend to the higher western part of the site. Finds from the Islamic period were limited to indicator pottery sherds found in disturbed layers, and no considerable architectural evidence from this period was detected, due to the destruction of the upper levels of the site. Only some pottery sherds and fragments of two mud brick walls were found from the historical, likely Parthian period. The Early Bronze Age layers were undisturbed and contained in situ sherds characteristic of Kura-Araxes pottery, but no distinct architectural remains were found. No useable samples for radiocarbon dating were taken from this trench.

Four test trenches 1, 3, 4, and 5 were excavated in the widely disturbed and leveled eastern part of the site. Seemingly, the Qaleh Tepe area has been used as a graveyard during the Iron Age, and traces of these graves were seen during the leveling of the eastern part of the site (Naghshineh et al, 2013-2014). But the four trenches yielded no evidence for graves or a settlement from this period, and there were only disturbed layers with mixed cultural materials. Ultimately, the ancient remains and layers were destroyed in this part of the site. Therefore, no dating samples were retrieved from these trenches.

The presence of Kura-Araxes pottery sherds on the surface of the northern part of the site and the possibility of finding undisturbed Bronze Age remains in this area motivated the excavation of test trench 2. Initially, TT.2 was 1x1 meters in size, but was later extended to 3x4 meters since intact in situ remains were encountered. Due to leveling and the construction of a street in this part of the site, the upper layers have completely disappeared. However, undisturbed remains from the earliest occupation at Qaleh Tepe were found intact underneath the street level. In TT.2, 32 contexts were distinguished with a total depth of 150 cm (fig. 4). While the upper contexts were disturbed by the street construction, the lower contexts with a depth of about 110 cm were intact, which revealed the earliest phase of an Early Bronze Age settlement on virgin soil. Thus, the most important and detailed finds from the Early Bronze Age settlement of the site were found in TT.2.

3. Kura-Araxes settlement at Qaleh Tepe

Remains of an Early Bronze Age settlement were found in trench A and TT.2 at Qaleh Tepe, both located atop virgin soil. The settlement was situated on a low curve with a slow slope to the south, overlooking the Abhar Rood River in the north. Since remains of the settlement were found only in the eastern part of Trench A, the settlement seemingly did not extend to the center of the site and was limited to northern and

eastern parts. In addition, it seems that the occupation period of this small settlement was not long, because the Early Bronze Age layers in Trench A measured only about 70 cm in depth (fig. 3). In TT.2, the top layers have disappeared due to the street construction and therefore the final layers of this period cannot be identified, but it seems that the Bronze Age deposits in this area have not been very deep because of the feature and topography of the site. Therefore, the Early Bronze Age settlement at Qaleh Tepe must have been a small and short-lived settlement with an extension of around one hectare.

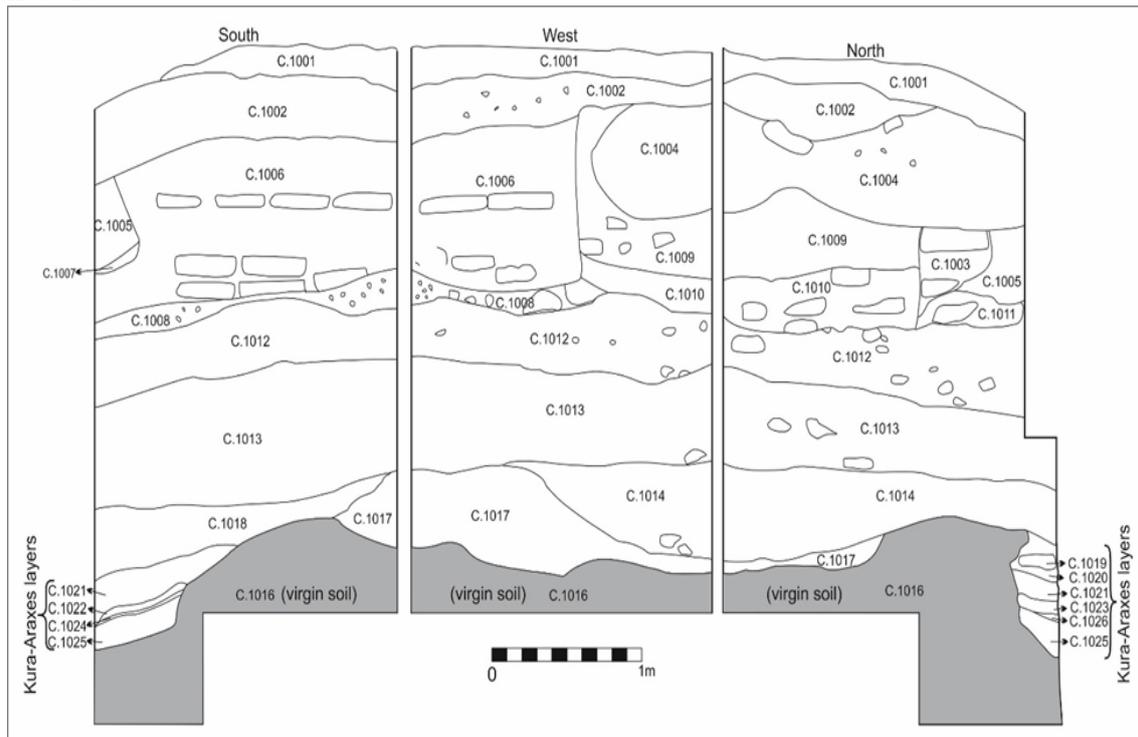


Fig. 3 Qaleh Tepe, stratigraphic sections of Trench A with Kura-Araxes layers exposed on the virgin soil

Significant settlement remains were discovered in TT.2 where the first building phase of a Kura-Araxes settlement was documented in the form of a part of a rectangular chamber (fig. 5). The walls of the chamber were built of mud and there were platforms of the same material along the walls. The surfaces of the walls, floor, and platforms were plastered with clay on which traces of black paint could be seen. This building is comparable with building 3 in Godin Period IV in the following aspects: the rectangular layout, the benches along walls, and the painting on the walls and benches (Young and Weiss, 1974: 208; Rothman 2011, 184, Fig. 5.43). Recovering fragments of two large jars on the floor suggests that the chamber was probably a storeroom. The building was filled with unmixed deposits consisting mainly of debris and layers composed of soil and ash. In addition to pottery sherds, various small objects characteristic of the Kura-Araxes cultural tradition were found, including three animal figurines, a horn knife handle, a bone awl, and three small disc beads.

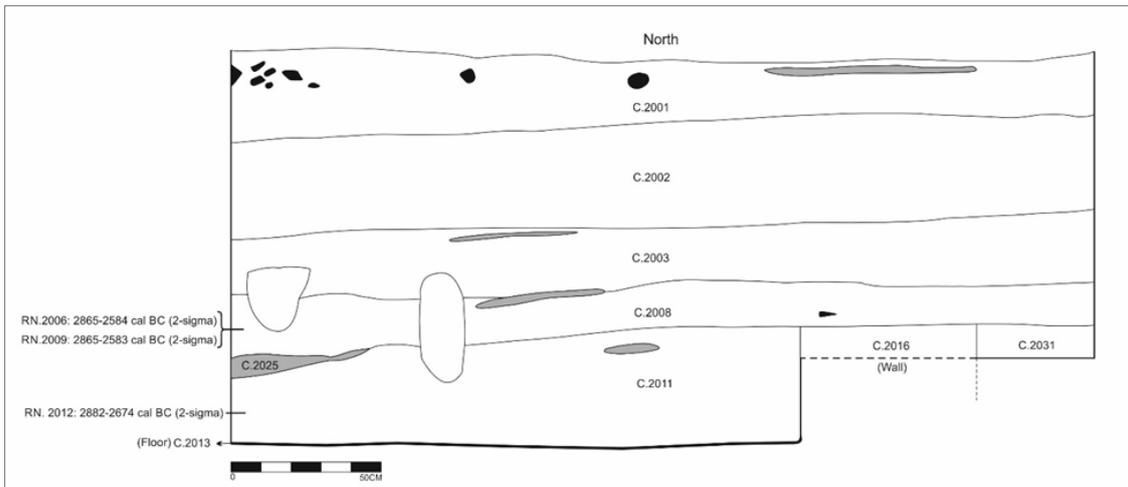


Fig. 4 Qaleh Tepe, the stratigraphic section of TT.2

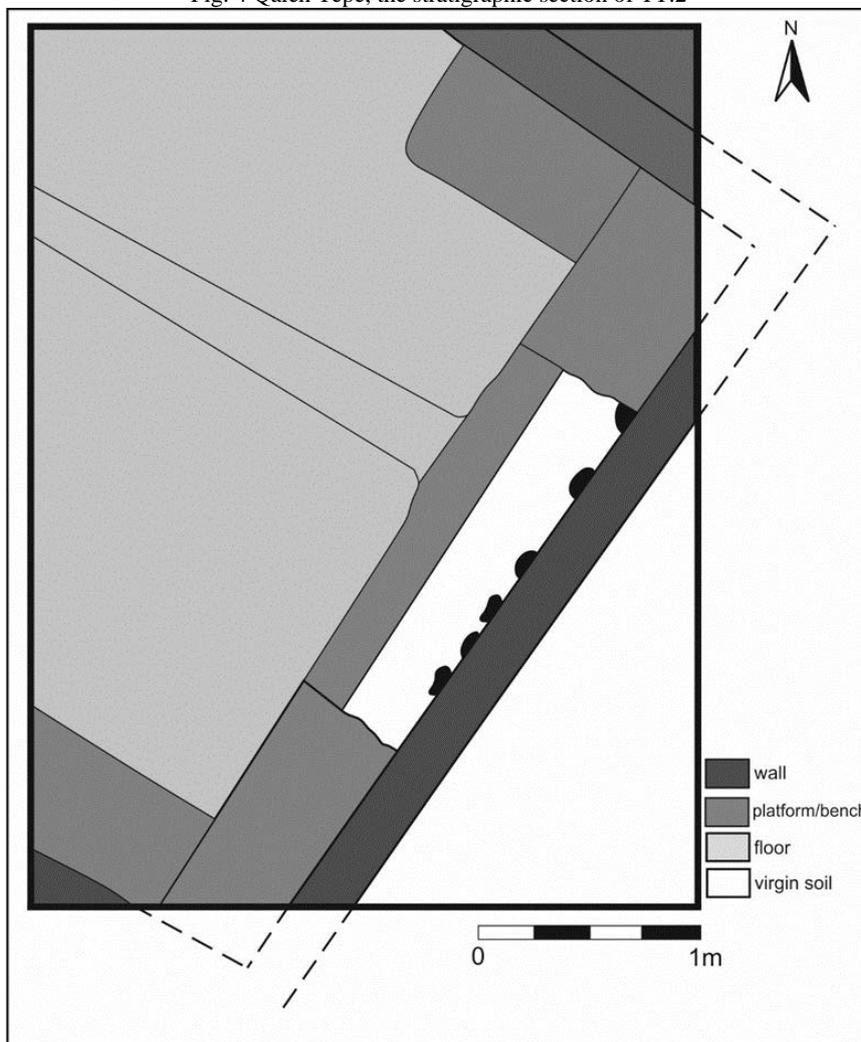


Fig. 5 Qaleh Tepe, plan of the Kura-Araxes structure uncovered at TT.2

Pottery sherds associated with the Early Bronze Age settlement at Qaleh Tepe display characteristics of the Kura-Araxes pottery tradition (fig. 6). They are mainly hand-made

and in their clay paste used mineral (grit) or rarely ground potsherd (grog) temper. The predominant color of wares is gray and the surfaces are usually polished. Some fine wares are decorated with geometric designs, the most frequent of which is the zigzag pattern (fig. 6 nos. 1 and 5). These zigzags were also common on the Kura-Araxes ceramics in the Zagros region (Young and Levine, 1974: fig. 19, n. 3; Rothman 2011, Fig. 5.60, a,b; Mohammadifar et al, 2009: fig. 3; Heydarian and Safari 2015, Fig. 4,7.9.10.13; Sharifi 2021, fig. 10, 16-17), the Alborz region (Fahimi 2005, Fig. 3, b; Mousavi et al. 2007, Pl. 3,1; 5,9) and the Central Plateau (Burton Brown, 1981: Pl. X, 152; Piller, 2012: Abb. 3, 4 a & b, 5, 6 a & b; Fazeli Nashli et al. 2013, Fig. 7.23; Kleiss, 1996: Abb. 18, 16). Generally, the Kura-Araxes pottery at Qaleh Tepe has more parallels with Kura-Araxes pottery on the Central Plateau and in the Zagros than in northwestern Iran, the southern Caucasus, and Anatolia, and therefore can be similarly dated to the first quarter of the 3rd millennium BC.

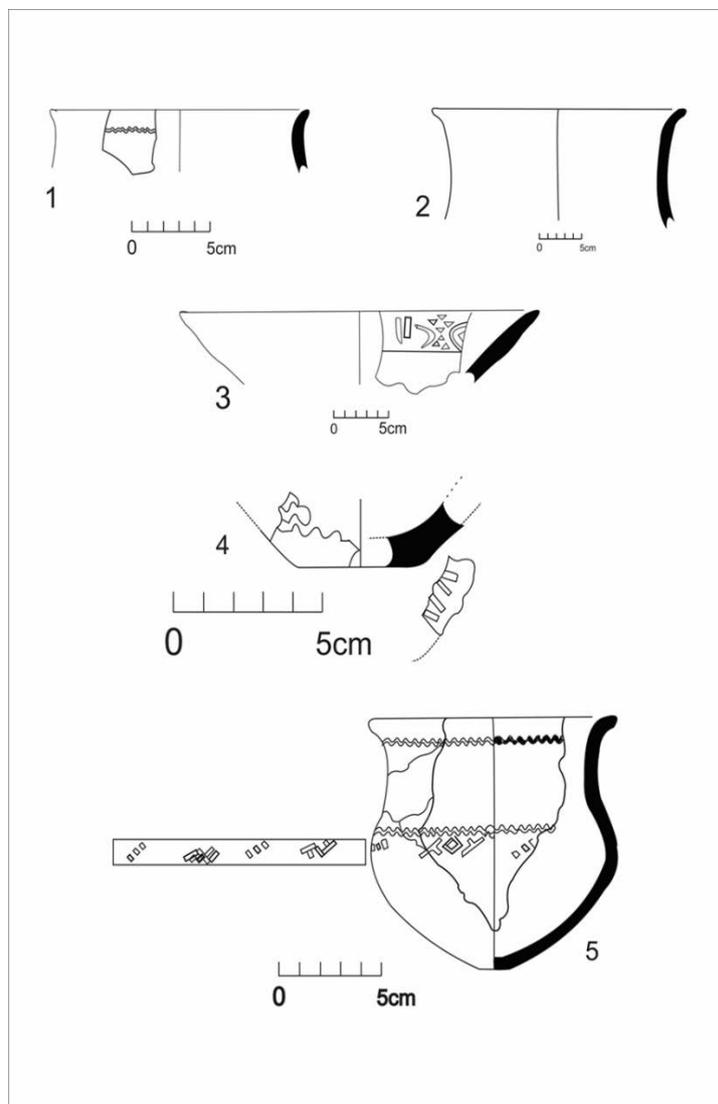


Fig. 6 Qaleh Tepe, Kura-Araxes pottery, TT.2, 1, 3-5 c.2008, 2 c.2006

5. Radiocarbon dates from the Kura-Araxes settlement at Qaleh Tepe

Only the excavation in TT.2 provided usable radiocarbon samples from contexts associated with the chamber (figs 4 and 5, table 1). One sample (RN.2012) was retrieved

Revisit the Kura-Araxes: The Absolute and Relative Chronology of Qaleh Tepe and Ali Yourd.. 211

from context 2011 that consisted of debris on the floor of the northern half of the chamber. It yielded a date range of 2882-2674 cal BC at 2-sigma. Two samples (RN.2006 and RN.2009) were taken from context 2008, a layer consisting of soil deposits, thin ash lenses, and a few mud fragments, located within the ruins of the chamber at a higher level than context 2011. These two samples provide the same dates range of 2865-2584 cal BC at 2-sigma. The fourth sample (RN.2010) was retrieved from context 2006, which comprises the contents of a shallow pit formed within context 2008 that destroyed a part of the southeastern bench of the chamber. This uppermost sample from context 2006 provides a date range of 2877-2637 cal BC at 2-sigma. On the basis of stratigraphic evidence, these contexts were formed in the order described above and belonged to the time of the destruction of the room and a very short time after that. The three contexts revealed homogeneous cultural materials characteristic of the Kura-Araxes cultural tradition. The four radiocarbon dates represent the time of destruction of the room and all fall into the same time range from the 29th to the 27th century BC. This interval describes the chronological span for the beginning of the Kura-Araxes occupation at Qaleh Tepe. Unfortunately, due to the destruction of the upper layers at the site, neither the duration and nor the end of this occupation can be clearly determined, but the shallow depth of Kura-Araxes deposits in Trench A, and the small amount of surface materials from this period, point to a short-term Kura-Araxes occupation at Qaleh Tepe.

Table 1

Lab-No.	Sample name	Context	CAL 1-Sigma	CAL 2-Sigma	Material
MAMS-29957	1-QALEH TEPE RN. 2012	TT.2, 2011	cal BC 2876-2702	cal BC 2882-2674	Animal Bone
MAMS-29958	2-QALEH TEPE RN. 2006	TT.2, 2008	cal BC 2856-2631	cal BC 2865-2584	Animal Bone
MAMS-29959	3-QALEH TEPE RN. 2009	TT.2, 2008	cal BC 2856-2631	cal BC 2865-2583	Animal Bone
MAMS-29960	4-QALEH TEPE RN. 2010	TT.2, 2006	cal BC 2872-2681	cal BC 2877-2637	Animal Bone

6. The site of Ali Yourd Tepe and its excavations

Ali Yourd Tepe (Lat. 36.1921°; Long. 49.0152°, Elevation c. 1768 m asl.) is located in the eastern part of Zanjan province on a natural terrace on the right side of the Abhar Rood River, on a strategic position overlooking a narrow plain that connects geographically the northwest to the Central Plateau of Iran. The site is an oval settlement mound with dimensions of nearly 160x120 m (c. 1.8 ha) that rises 26 m on the northern side and 15 m on the southern side above the surrounding lands (figs 7 and 8).

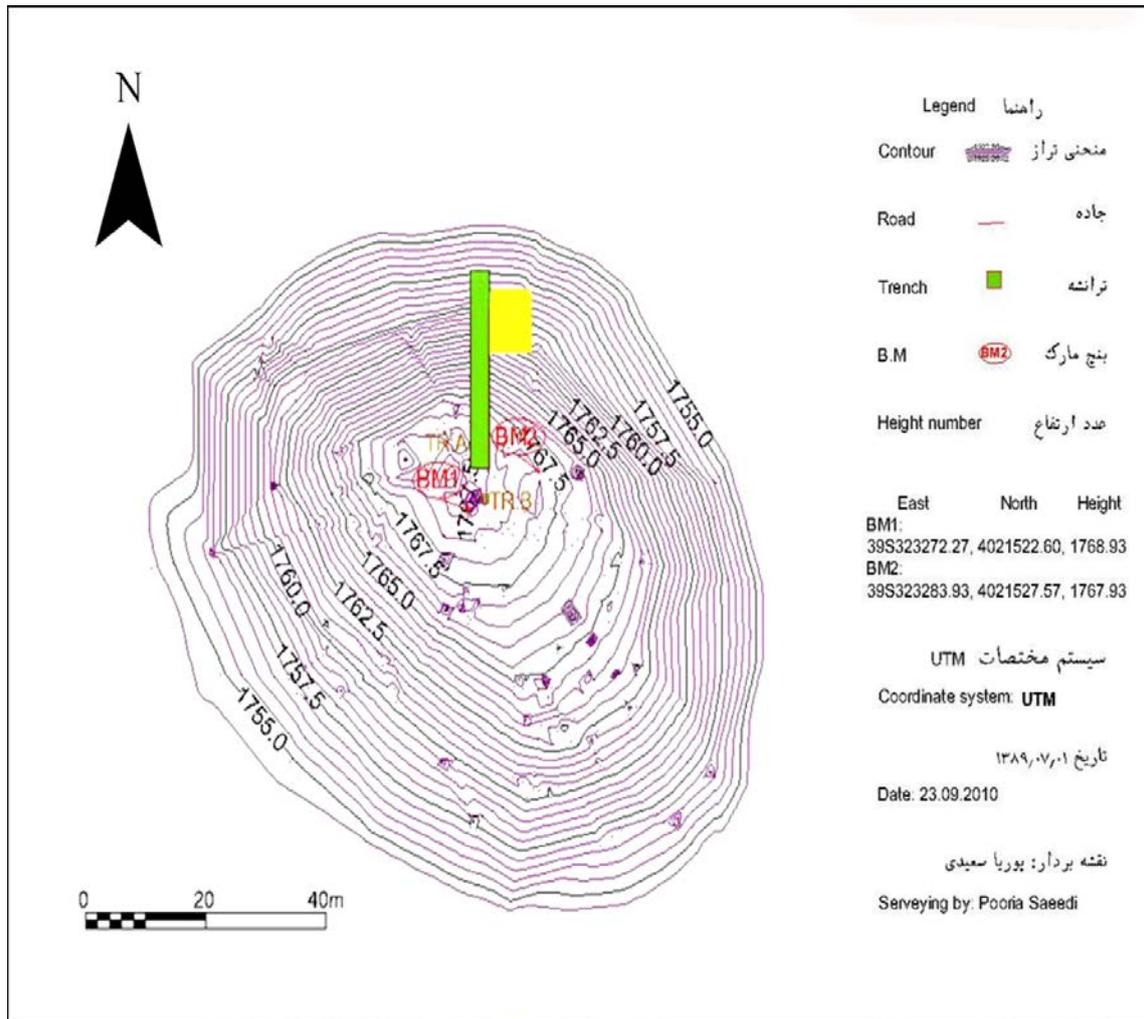


Fig. 7 Ali Yourd Tepe, topographic map indicating locations of excavation trenches

Ali Yourd Tepe was excavated in four seasons (from 2010 to 2014) to establish a complete cultural sequence for the site (Naghshineh, 2011, 2014, 2016). Excavations were carried out with a major step-trench (Trench A) on the northern side of the site, a small sounding (Trench B) on the top of the mound, and an extensive trench (Trench C) adjacent to the bottom part of the step trench. Trench A with a 2 m width and a total length of 30 m was excavated in three 10 m-long sections (A1 to A3 from top to bottom) on the northern slope of the mound. Thereby, natural soil was reached at a depth of 1594 cm below the summit of the mound, revealing that a part of the total height of the site on the northern side is due to the natural terrace underlying the settlement. Trench B was a small sounding (1.2x1.2 m) excavated on the section of an illegally dug pit on the top of the mound, that only exposed a few remains of the Islamic and Parthian periods. Excavation in trench B was stopped at the depth of 330 cm, because of close and limited space. Trench C was an extensive exposure (5 x 8 m) on the eastern side of the lowest section (A3) of step-trench A to find more details from the Early Bronze Age settlement that was inadequately revealed in lower deposits in step-trench A. Because of the end of the excavation season, excavation in this trench did not

Revisit the Kura-Araxes: The Absolute and Relative Chronology of Qaleh Tepe and Ali Yourd.. 213
continue until natural soil and stopped at a depth of about 1400 cm below the summit of the mound.



Fig. 8 Ali Yourd Tepe, view of the mound from the north onto Trenches A and C

The excavations revealed remains from four major periods: Islamic, historical (Parthian?), Iron, and Bronze Ages. Remains of the Islamic period were limited to a small and short-term occupation on the top of the mound, documented in Trenches A and B. In the upper part of section A1 on the top of the mound, remains of one building phase of the Islamic period were found that consisted of a stone foundation, the bottom parts of three ovens, and three trash pits dug into the lower Parthian layers.

Parthian remains were exposed in all three trenches, especially along the steep northern slope of the mound in Trenches A (all three sections A1-A3) and C. The most important architectural remains were walls constructed from large mud bricks extending in east-west-direction. They were badly eroded in most places. Seven of these walls were identified on the slope of the site at different levels in trenches A and C, the uppermost at 170 cm and the lowest at 1518 cm below the summit of the mound. The most probable function of these walls seems to prevent and control soil erosion and landslides on the steep slope of the site by creating a stepped structure with horizontal and usable terraces along the slope. From the Iron Age, no trace of intact remains was identified in any of the trenches, so this occupation was documented mainly from indicator pottery sherds from disturbed layers and surface, therefore, no sample for radiocarbon dating was obtained from this period. The mound likely served as a graveyard during the Iron Age.

7. Kura-Araxes settlement at Ali Yourd Tepe

The Early Bronze Age remains, the earliest occupation at the site, were exposed mainly in the section A3 of Trench A and adjacent Trench C (figs 9 and 10). Four building phases are stratigraphically confirmed in these adjacent trenches (fig. 11); however, there are probably other remains in the upper and interior parts of the mound. There was no gap between the four phases so in some cases the upper phase wall was built directly on the lower phase wall.

The first phase was founded directly on the virgin soil and was exposed only in the lowest level of section A3, consisting only of a corner of a room and a small part of an associated exterior floor. The floor was located outside the room and was 26 cm below the level of the room on natural soil. Because of this difference in depths, the floor was previously considered as an older phase than the room, while this situation was due to the slope of the natural terrace underneath the settlement. One radiocarbon sample (RN.3192) was taken from the soil and ash layer on this floor. In trench C, the remains of the first phase were not excavated due to the end of the excavation season.

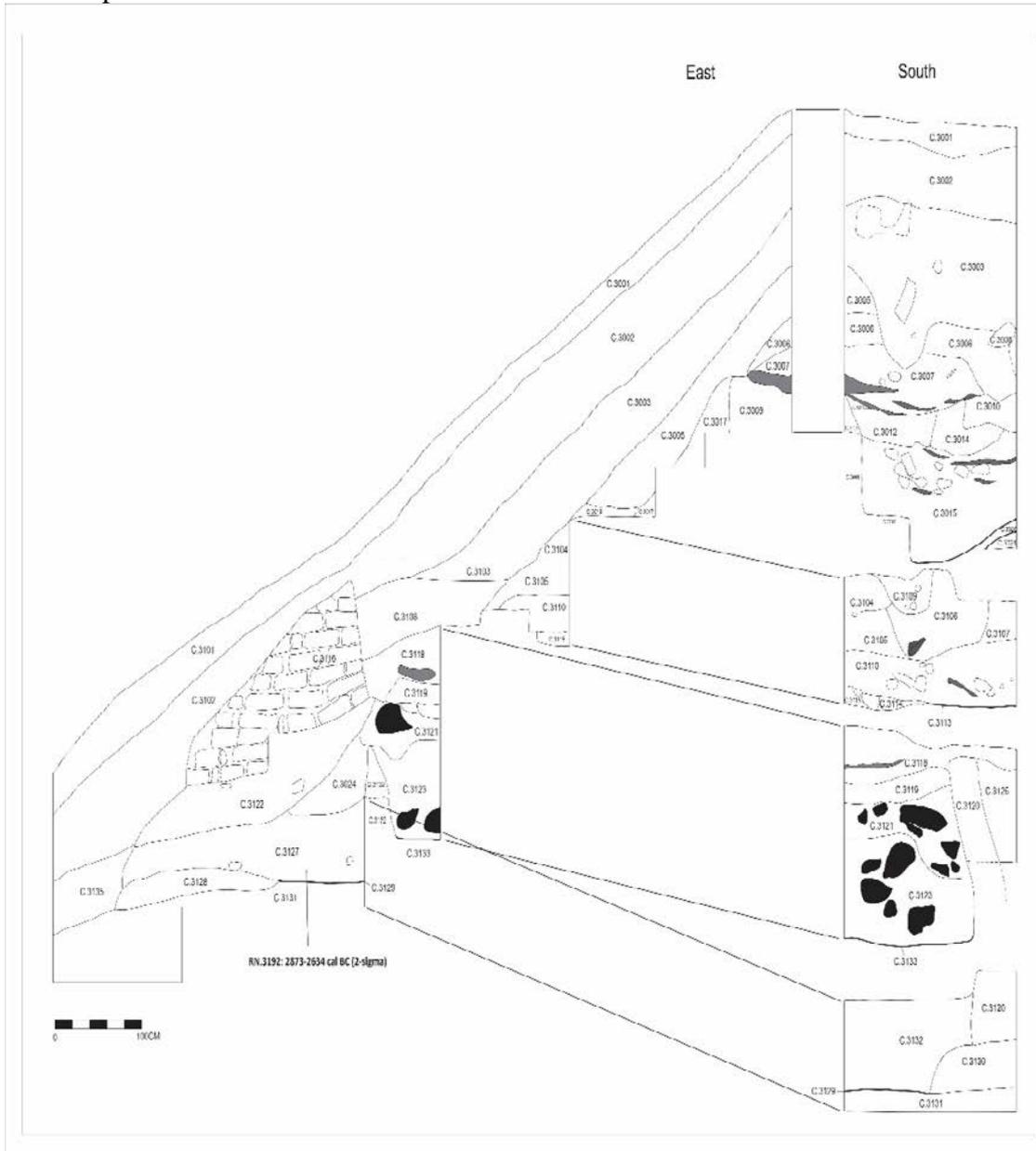


Fig. 9 Ali Yourd Tepe, stratigraphic sections of section A3

The remains of the second phase in section A3 were limited to a clay floor and parts of two heavily damaged hearths. In adjacent trench C, the excavated area in this phase was small, hence only a small part of a room was found in the boundary between the two trenches. From this phase, no appropriate radiocarbon sample was obtained.

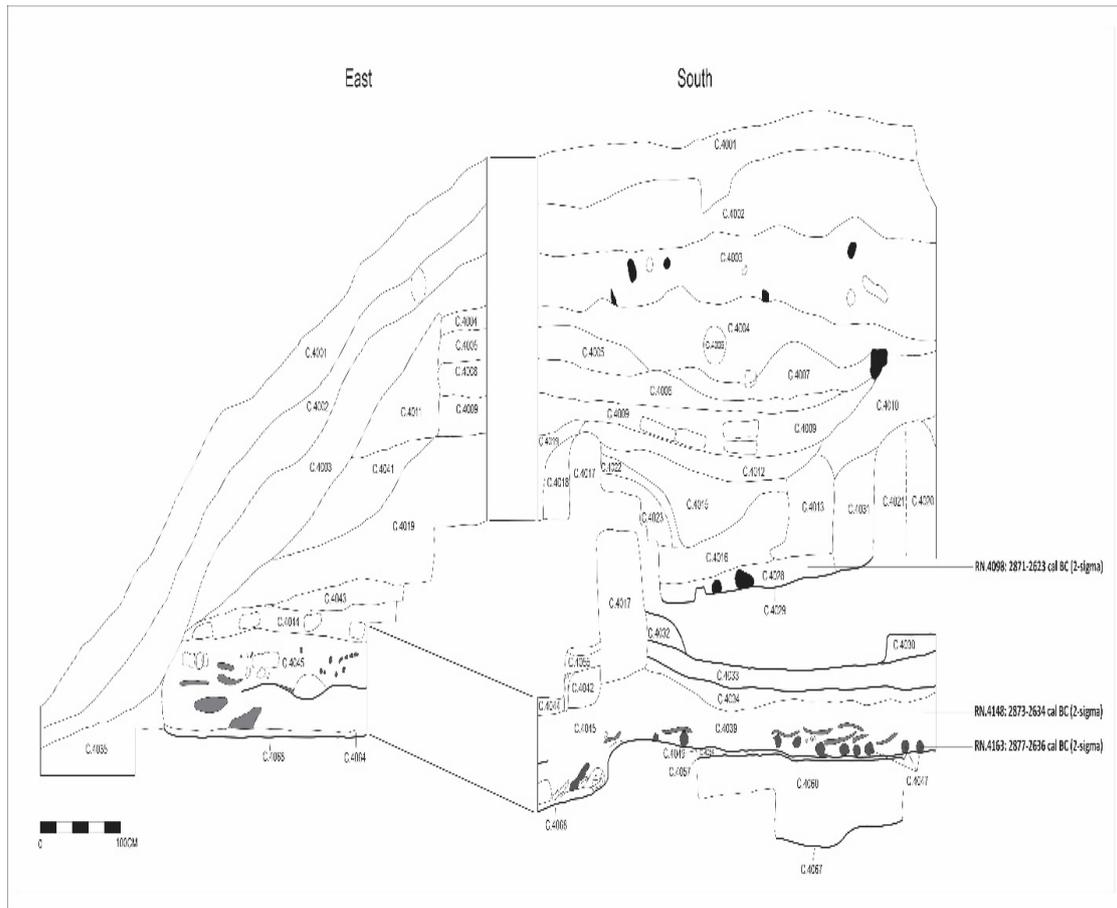


Fig. 10 Ali Yourd Tepe, stratigraphic sections of Trench C

Remains from the third building phase were documented only in Trench C and could not be identified in Trench A. , trench C contained a part of a building consisting of two side-by-side rooms connected by a doorway. The eastern room, of which a small part was unearthed, was placed at a lower depth rather than the western room. A strong fire had destroyed the building and the roof had collapsed on the floor, creating an up to 50 cm thick layer of burnt debris, ash, and charcoal. From this layer, a charcoal sample (RN.4148) was retrieved for radiocarbon dating. In addition, on the floor of the western room, there were remains of the roof's burned beams, of which a radiocarbon sample (RN.4163) was taken.

Remains of the fourth phase were exposed in both trenches A and C, consisting of three side-by-side rooms along an east-west axis, of which the eastern room was located in trench A and the two others extended into trench C. The rooms were placed directly on the burned building of previous phase 3, and some of the new walls were constructed exactly on top of the preserved walls of the burned building. The middle room, which was exposed to a larger extent than the two others, was divided by a bulge on the floor into a northern and a southern part; a thermal structure was found on the edge of the southern part, which was covered several times with thick layers of clay. A radiocarbon sample (S.N.4098) was taken from a soil and ash layer on the middle room's floor.



Fig. 11 Ali Yourd Tepe, Trench C, Kura-Araxes architecture, Phases 2, 3, and 4

Over four seasons of excavations at Ali Yourd Tepe, finds from deposits of different periods were restricted almost entirely to pottery sherds. Sherds from the Early Bronze Age deposits display characteristics of the Kura-Araxes pottery tradition (fig. 12). They are mainly hand-made and polished. The predominant color of wares is light to dark gray, but some pieces have black, grayish brown, or reddish brown surfaces. Temper is mostly mineral, but sometimes organic materials or ground potsherds (grog) are also used as temper. The most common forms include a variety of bowls and jars, which all fit well within the Kura-Araxes corpus of ceramic containers. Around 2% of the ceramics are decorated with incised geometric designs, the most common of which is the zigzag pattern under the rim or on the shoulder of vessels. Best comparisons for this pattern come from the Zagros region, the Alborz region, and the Central Plateau, alike Qaleh Tepe (as seen above). In general, the Kura-Araxes pottery at Ali Yourd Tepe like those from Qaleh Tepe has the most links with the Kura-Araxes pottery on the Central Plateau and the Zagros region. In addition, three broken clay figurines were recovered from a layer underneath the floor of the fourth phase in trench C, which were the most important small finds from the Kura-Araxes deposits.

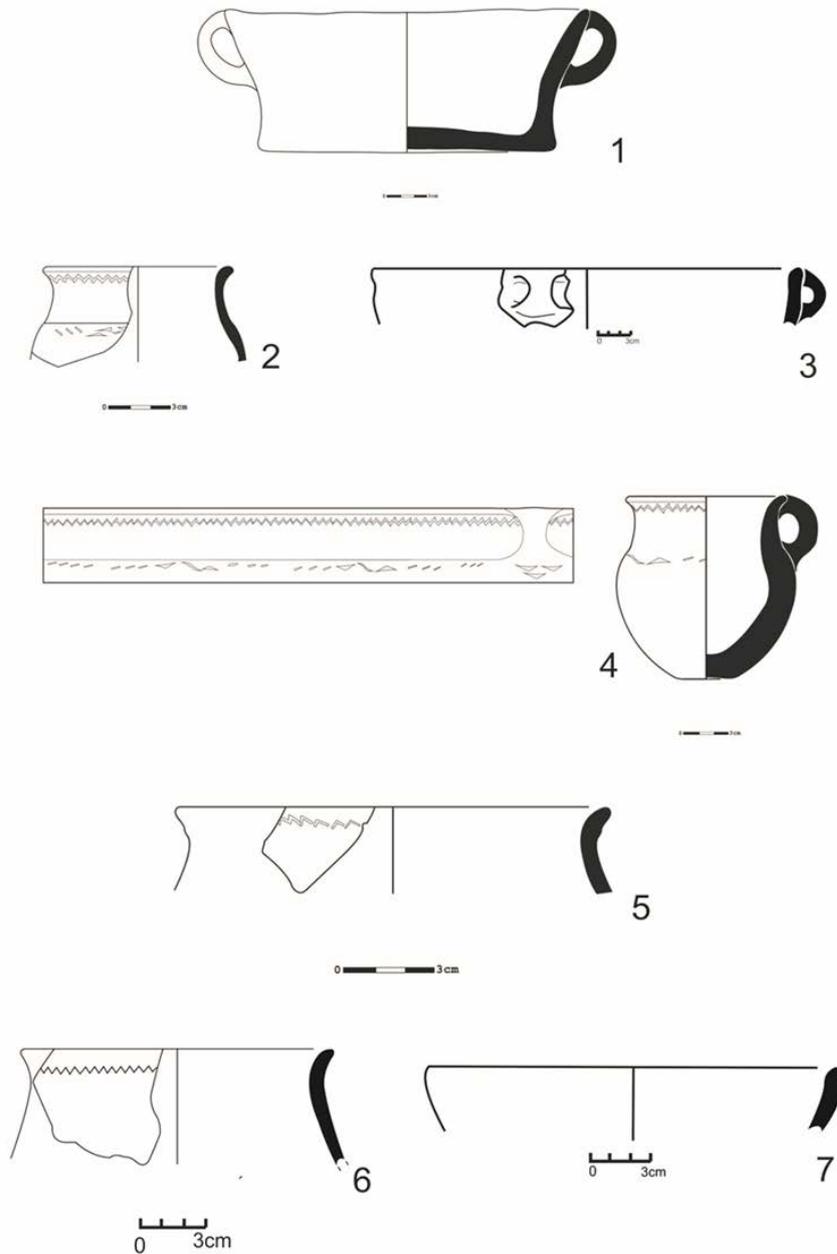


Fig. 12 Typical Kura-Araxes pottery from Ali Yourd Tepe; 1) Conical bowl with two handles from c.4023, phase 4; 2) Small jar with incised decoration from c.4046, phase 2; 3) Handled bowl from c.4064, phase 2; 4) Small handled jar with incised decoration from c.4061, phase 3; 5) Jar with incised decoration from c.4061, phase 3; 6) Jar with incised decoration c.3124, phase 4; 7) Rounded bowl from c.3123, phase 4

8. Radiocarbon dates from the Kura-Araxes settlement at Ali Yourd Tepe

Five radiocarbon samples were taken from contexts associated with different phases of the Kura-Araxes occupation at the site excavated in trenches A and C (figs 9 and 10, table 2). These samples were taken from contexts containing cultural materials, particularly

pottery sherds, which display characteristics of the Kura-Araxes cultural tradition. The stratigraphically oldest sample (RN.3192) was taken from a soil and ash layer on the floor of the first building phase on natural soil. The sample yielded a date range of 2873-2634 cal BC at 2-sigma. From the second building phase, no convenient sample was recovered. Two samples were taken from the third phase, one (RN.4163) from burnt beams fallen on the floor of the middle room (fig. 13), as well as another (RN.4148) from the debris layer on the same floor, both in the trench C; the former yielded a date range of 2877-2636 cal BC at 2-sigma and the latter a range of 2873-2634 cal BC at 2-sigma. From the fourth building phase, two samples were retrieved, one (RN.4098) from the debris layer on the floor of a room exposed in trench C and another (RN.2291) from a soil and ash layer higher than the ruins of the fourth building phase in the lowermost level of the section A2, which is the uppermost sample. The former yielded a date range of 2871-2623 cal BC at 2-sigma and the latter a date range of 2867-2587 cal BC at 2-sigma.



Fig. 13 Ali Yourd Tepe, Trench C, burnt beams fallen on the floor of a room from the Kura-Araxes third building phase

These samples set in on the stratigraphic sequence with four architectural phases of the Kura-Araxes occupation at the site. The sample (RN.3192) from the first phase was taken from a layer that was probably disturbed by surface erosion or a stone structure belonging to the later periods because there were many stones on the deposits of the first phase. The sample (RN.4163) from a burnt beam fallen on the floor of a room in the third building phase point to the time of construction of the room (RN.4148). The result of the sample (RN.4098) from the debris of the fourth phase is very close from the third phase; probably, the duration of the third building phase has been very short due to fire accident. The result of the stratigraphically latest sample (RN.2291) from a layer above

Revisit the Kura-Araxes: The Absolute and Relative Chronology of Qaleh Tepe and Ali Yourd.. 219

the ruins of the fourth building phase indicates a longest time span expands to the early 26th century BC. Hence, the beginning of the Kura-Araxes occupation at Ali Yourd Tepe falls into a similar time span as the occupation at Qaleh Tepe between the 29th and 27th century BC. The end of the Kura Araxes occupation is not clear. In levels above the fourth phase in section A2, there are further Kura-Araxes deposits, but due to limited excavation no convenient radiocarbon sample was recovered. Therefore, occupation must continue after the fourth phase, but its extent is not known, likely not for a long time.

Table 2

Lab-No.	Sample name	Context	CAL 1-Sigma	CAL 2-Sigma	Material
MAMS-29975	2871.1 Ali Yourd, RN. 2291	Trench A2, C.2232	cal BC 2857-2633	cal BC 2867-2587	Animal bone, Caprini, shaft of metacarpal
MAMS-29976	5 Ali Yourd, RN. 3192	Trench A3, C.3127, D: 1585cm	cal BC 2865-2674	cal BC 2873-2634	Animal bone, Caprini, Molar 3, Right maxilla
MAMS-29977	11 Ali Yourd, RN. 4163	Trench C, C.4047, D: 1324cm	cal BC 2871-2680	cal BC 2877-2636	Charcoal, large piece
MAMS-29978	12 Ali Yourd, RN. 4148	Trench C, C.4039, D: 1318cm	cal BC 2865-2673	cal BC 2873-2634	Charcoal
MAMS-29979	13 Ali Yourd, RN. 4098	Trench C, C.4028	cal BC 2860-2636	cal BC 2871-2623	Charcoal

Lab-No.	Sample name	Context	CAL 1-Sigma	CAL 2-Sigma	Material	Building phase	Stratigraphical description
MAMS-29976	5 Ali Yourd, RN. 3192	Trench A3, C.3127, D: 1585cm	cal BC 2865-2674	cal BC 2873-2634	Animal bone, Caprini, Molar 3, Right maxilla	1	from a soil and ash layer that was probably disturbed by surface erosion or a later stone structure
-	-	-	-	-	-	2	
MAMS-29977	11 Ali Yourd, RN. 4163	Trench C, C.4047, D: 1324cm	cal BC 2871-2680	cal BC 2877-2636	Charcoal, large piece	3	from a burnt beam fallen on the floor
MAMS-29978	12 Ali Yourd, RN. 4148	Trench C, C.4039, D: 1318cm	cal BC 2865-2673	cal BC 2873-2634	Charcoal	3	from a debris layer on the floor
MAMS-29979	13 Ali Yourd, RN. 4098	Trench C, C.4028	cal BC 2860-2636	cal BC 2871-2623	Charcoal	4	from a debris layer on the floor
MAMS-29975	2871.1 Ali Yourd, RN. 2291	Trench A2, C.2232	cal BC 2857-2633	cal BC 2867-2587	Animal bone, Caprini, shaft of metacarpal	4	from a soil and ash layer above the ruins of the fourth building phase

9. Discussion

The settlements at the two sites of Qaleh Tepe and Ali Yourd Tepe have several similarities in diverse aspects. Both are located on the natural terraces on the southern side of the main river of the region on the floor of a narrow valley, which geographically connects the northwest to the north central of Iran. These situations enabled the inhabitants of both sites to conveniently access fresh water, agricultural lands, and connecting routes, therefore, they settled in the heartland of the region. The

Kura-Araxes settlements at both sites were small with an estimated extension of around one hectare. In addition, both sites were first occupied by Kura-Araxes populations and after this time abandoned for several centuries until the Iron Age, when they were used as graveyards. On the other hand, no trace of relationships with other cultural traditions was found in the Kura-Araxes levels at both sites, whereas the presence of chalcolithic societies has been documented in the region (Alibaigi et al. 2012, 463). Seemingly, the Kura-Araxes populations occupied the valley and settled at previously unsettled locations, such as the places where Qaleh Tepe and Ali Yourd Tepe formed, and after a period of around one to two centuries these communities disappeared again.

The Kura-Araxes materials from both sites are very similar. Architectural remains at both sites reveal rectangular buildings formed by mud walls. The Kura-Araxes ceramics at both sites are predominantly gray and decorated with some impressed or incised geometric designs, particularly zigzag designs. Some of these designs are filled with a white paste that is “typical and apparently exclusive” to Iran (Palumbi, 2019: 33). Generally, the pottery forms and decoration style of the Kura-Araxes occupations at both sites are more comparable with the Zagros region and the Central Plateau than with northwestern Iran. Therefore, the similarities between the Kura-Araxes materials from both settlements point to a close date for them.

The results of radiocarbon dating from the Kura-Araxes occupations at Qaleh Tepe and Ali Yourd Tepe are the most important evidence for dating these occupations and also the presence of Kura-Araxes cultural tradition in the region, which generally confirm the relative dating suggested above. All dates are close together and fall on a time span from 29th to 27th centuries BC. None of them extends back to beyond 2900 BC (tables 1 and 2), therefore, the Kura-Araxes occupations at Qaleh Tepe and Ali Yourd Tepe were not begun before this time. The end of the Kura-Araxes occupations at both sites is not precisely identified, because of the destruction of upper levels at Qaleh Tepe and the absence of radiocarbon dates from upper levels at Ali Yourd Tepe. However, it is clear that the duration of occupation at Ali Yourd Tepe was longer because there are four building phases as well as some Kura-Araxes deposits in the upper levels, while the Kura-Araxes deposits at Qaleh Tepe are obviously of a lower depth.

The dating of the Kura Araxes occupations at both sites is equivalent to the second phase of development of the Kura-Araxes tradition in which it extended to the west, south, and east; the phase started about 3000/2900 BC and is characterized as “the period of highest regionalism” (Sagona 2018: 226). Ceramics with incised and excised decorations filled with white paste are typical of Kura-Araxes pottery in Iran and are known from the Urmia region to the Zagros Mountains and the Central Plateau, dating between 3000 and 2750 BC (Palumbi, 2019: 34). This ceramic decoration style is also attested at Qaleh Tepe and Ali Yourd Tepe. All the evidence indicates that the cultural tradition spread in the Zagros region and the Central Plateau of Iran during this period. On the Central Plateau, the Early Bronze Age II, which represents the Kura-Araxes tradition in the region, was dated after 2900 BC, predominantly based on radiocarbon dates of the contexts containing Kura-Araxes ceramics at Tepe Shizar (Fazeli Nashli et al. 2013: 114, tab. 7.1. and 7.3). The site of Shizar is located on the western edge of the Qazvin Plain. One probable route for the spreading of the Kura-Araxes tradition towards the Qazvin Plain and Shizar is through the geographical corridor of the Abhar

Rood basin, where the two sites of Qaleh Tepe and Ali Yourd Tepe are located. It is worth noting the considerable similarity of the Kura-Araxes pottery in these three sites.

From the two sites Kelar and Ghal-e Ben, located on the northern side of the Alborz Mountains, Kura-Araxes materials have been found, which are associated with several radiocarbon dates. Although there are more finds at Kelar, the details of their dating have not yet been analyzed, but the dates generally indicate the first half of the third millennium BC (Mousavi et al. 2007: 484, pl. 4, 5; Heydarian and Mousavi Kouhpar, 2021: 5, table 1). At Ghal-e Ben, only a few Kura-Araxes sherds have been found, which were situated within a context containing local ceramics related to a common Bronze Age tradition in northeastern Iran. Seemingly, this limited evidence cannot demonstrate the presence of a Kura-Araxes settlement at Ghal-e Ben, however, based on the results of radiocarbon dating, a date of 2500-2400 BC has been proposed for the presence of Kura-Araxes culture in the region (Fazeli Nashli et al., 2022: 124, 129, drawing 2 n. 3, 4, 15). A similar date has been suggested for Kura-Araxes occupation at the two sites of Barlekin and Tepe Ostur near Tehran (Matthews and Fazeli Nashli, 2022: 248). On the other hand, the Kura-Araxes occupation at Godin IV was dated sometime between 2900 and 2600 BC, on the basis of radiocarbon dating (Rothman, 2011: 163, table 5.2). In general, it seems that the radiocarbon dates of Qaleh Tepe and Ali Yourd correspond more closely with the dates of Shizar and Godin IV than Ghal-e Ben, which indicates a date later than other Kura-Araxes settlements in the Zagros region and the Central Plateau of Iran.

10. Conclusion

The results of radiocarbon dating in the two sites of Qaleh Tepe and Ali Yourd Tepe have shed new light on the time of expansion of the Kura-Araxes cultural tradition towards its eastern borders in the Central Plateau of Iran. These results correspond well with similar dates at Tepe Shizar, the nearest excavated Kura-Araxes settlement, and confirm the presence of Kura-Araxes tradition in the region sometime after 2900 BC. Seemingly, the expansion of the Kura-Araxes culture onto the Central Plateau of Iran occurred a short time after the abandonment of the Proto-Elamite settlements, therefore, no traces of Proto-Elamite traditions have been found in any of the Kura-Araxes sites. This cultural change has been the basis for separating the Early Bronze Age in the region into two phases I and II (Fazeli Nashli et al. 2013: tab. 7.1.). The end of Kura-Araxes in the Central Plateau cannot be dated precisely; the excavations have not exposed clear evidence, and there are no radiocarbon dates in this regard. But it seems that the Kura-Araxes tradition did not last more than 2 or 3 centuries in the region. This timeframe for the Kura-Araxes tradition on the Central Plateau is very close to the period of Kura-Araxes occupation at Godin Tepe that “almost certainly lasted less than 250 years” (Rothman 2011: 167). It seems that the cultural developments in the early centuries of the third millennium BC had a similar trend in the Central Zagros and Central Plateau so that the Kura-Araxes tradition spread in these regions and formed a cultural horizon around 2900-2600 BC.

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Revisit the Kura-Araxes: The Absolute and Relative Chronology of Qaleh Tepe and Ali Yourd.. 223

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چکیده

جوامع کورا-ارسی با ویژگی‌های فرهنگی و اقتصادی به‌شدت متمایز خود، طی عصر مفرغ در بخش‌های وسیعی از قفقاز و خاور نزدیک پراکنده شدند. عموماً خاستگاه این فرهنگ در جنوب قفقاز در نظر گرفته می‌شود، ولی گسترش این سنت فرهنگی در ایران نشانگر یک گسست فرهنگی در توسعه سنت‌های فرهنگی مرتبط با بین‌النهرین است. همچنین تغییرات محیطی مرتبط با تغییر سریع اقلیم نیز جوامع انسانی را وادار به توسعه راهبردهای اقتصادی جدید کردند. تا حدود دو دهه پیش، آگاهی باستان شناسان از حضور فرهنگ کورا-ارس در ایران محدود به شمال غرب و بخش‌هایی از زاگرس مرکزی بود، ولی پژوهش‌های اخیر در مناطق شمالی و جنوبی رشته‌کوه‌های البرز و بخش شمالی فلات مرکزی، امکان ترسیم تصویری دقیق‌تر از سکونت جوامع کورا-ارسی را در دو چشم‌انداز در زمانی و هم‌زمانی فراهم می‌کند. کاوش‌های اخیر در دو محوطه قلعه تپه و علی یورد تپه، واقع در حوزه آبریز اهررود در استان زنجان، داده‌های جدید و مهمی را از استقرارهای کورا-ارسی در مسیر طبیعی ارتباطی میان فلات مرکزی و شمال غرب ایران آشکار کرده‌اند. این مقاله قصد دارد بر پایه تاریخ‌گذاری‌های رادیو کربن از این دو محوطه گاهنگاری فرهنگ کورا-ارس در ایران را به‌روزرسانی نماید. لایه‌نگاری و تاریخ‌گذاری‌های رادیو کربن در این دو محوطه نشان می‌دهند که آغاز استقرار جوامع کورا-ارسی در منطقه در بعد از ۲۹۰۰ پ.م رخ داده و به دنبال آن به‌سرعت در فلات مرکزی در محوطه‌هایی همچون شیزر، دوران آباد، اوستر و بارلکین گسترش یافته است. مشابهت و متمایز بودن از ویژگی‌های مجموعه فرهنگی کورا-ارس است و داده‌های اخیر، خصوصاً سبک سفالی و همچنین شواهد و بقایای معماری، نشانگر حضور سنت فرهنگی مشترکی در نیمه اول هزاره سوم پ.م در مناطق زاگرس مرکزی، شمال غرب و فلات مرکزی ایران هستند.

واژه‌های کلیدی: گسترش کورا-ارس، گاهنگاری کورا-ارس، فلات مرکزی ایران، قلعه تپه، علی یورد تپه