

CASE STUDY

Absolute Chronology of the Dalma Period in Northwestern Iran: Insights from the Belachak 3 Site

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Abstract

In recent decades, numerous excavations have been conducted at prehistoric sites in northwestern Iran, and the results of these studies have contributed to the development of a chronological framework for the region. The early Chalcolithic period in this area is referred to as the Dalma or Hasanlu X period. Various theories have been proposed regarding the chronological span of this culture, yet challenges and debates about its dating remain. The Belachak 3 site is one of the settlements attributed to this period, excavated by the first author of this article. The excavation results indicate that the site was temporarily occupied. The pottery recovered from this site closely resembles the ceramics found at well-known Dalma sites such as Dalma Tepe and Nad Ali Beig. This article aims first to explore the relative and absolute chronology of the Belachak 3 site. Subsequently, it evaluates the dating of this culture based on the absolute chronology of this and other Chalcolithic sites in western and northwestern Iran. For dating Belachak 3, five animal bones were sent to the Poznań Radiocarbon Laboratory. The results indicate that the site was occupied around 5000–4700 BCE. Additionally, based on the pottery findings and absolute dating, it can be suggested that the Dalma culture likely emerged in the late 6th millennium BCE and became widespread across large areas of western and northwestern Iran from around 5000 BCE onward.

Introduction

During the Neolithic period, various cultures emerged across different regions of Iran (Hole 1987; Jamshidi Yeganeh 2023; Khanipour 2023, 2025; Khanipour and Azizi Kharanaghi 2024; Voigt and Dyson 1992). Based on differences in pottery, Iranian archaeology divides the country into several cultural zones. Malek Shahmirzadi identified nine cultural zones in Iran (Malek Shahmirzadi 2012). So far, many studies have been conducted on the relative and absolute chronology as well as the subsistence strategies of these regions (Abbasnejad Seresti and Sattari Galoogahi 2022; Alirezazadeh and Heydarian 2022; Ashrafi and Shirani 2024; Khanipour 2024a, 2024b; Khanipour and Jamshidi Yeganeh 2025; Khanipour and Nishiaki 2024; Khanipour et al. 2021a, 2021b). The western region of Iran is referred to as the Central Zagros, while the northwestern region is known as the Northern Zagros or the Northwestern Cultural Zone (Khanipour and Akbari 2024; 2025).

In most periods, the cultural materials of these zones are distinct; however, during the Chalcolithic period, a ceramic tradition emerged across the two zones, parts of eastern Mesopotamia, and the southern Caucasus. This ceramic tradition, first identified from excavations at Dalma Tepe in northwestern Iran (Karimikiya et al. 2022), is known as the Dalma culture. Although various reasons have been proposed for the wide distribution of Dalma ceramics, many researchers believe that the nomadic lifestyle and subsistence strategies of Dalma communities played a significant role in their widespread presence (Abdi 2002; Henrikson and Vitali 1987; Heidari, 2016).

Despite decades of archaeological excavations at Dalma-period sites and studies conducted on the topic (Hamlin 1975; Henrickson 1983), major challenges remain regarding the chronology of this period, its place of origin, and the timing and mechanism of its spread across such a vast geographical range. These challenges are primarily due to limited excavations, a lack of absolute dating, and the reliance on relative chronology in earlier studies. Most foundational archaeological research in this region predates the adoption of interdisciplinary studies and absolute dating methods, and even the few absolute dates available lack precision and do not accurately represent the period.

It is therefore essential to conduct radiocarbon dating on multiple sites to establish precise timelines for Dalma settlements in each region. This would enable researchers to determine the origin and expansion timeline of this culture. During the archaeological survey and excavation of the Belachak 3 site, cultural materials similar to those of the Dalma period were uncovered. Given the lack of absolute dates for this period in northwestern Iran, the radiocarbon results from Belachak 3 provide valuable insights into the time frame during which this culture was present in the region.

This article begins by discussing the existing challenges in the chronology of the Dalma period. It then introduces the Belachak 3 site and presents the findings from its excavation, including the absolute dating results. Finally, using a combination of relative cultural material comparisons and absolute chronology, the timeline of the Dalma culture's prevalence in northwestern Iran is evaluated.

Chronological challenges of the Dalma period

The Dalma period in northwestern Iran is classified as the Early Chalcolithic or Hasanlu X phase within the Hasanlu chronology (Neseri Someeh and Bakhtiari 2024). For the first time, Young dated the Dalma painted pottery to the 5th millennium BCE (Young 1963). Hamlin attempted to provide a chronology for the Dalma period. From Dalma Tepe, a radiocarbon date of 4215 ± 85 BCE was obtained. Additionally, five radiocarbon samples from Hasanlu X (the Hajji Firuz period, second half of the 6th millennium BCE) and six radiocarbon samples from Hasanlu VIII (the Pisdeli period, 4th millennium BCE) were analyzed. Based on this evidence, Hamlin proposed a timeframe of 5000 to 4000 BCE for Hasanlu IX (Dalma) (Hamlin 1975, 119–120). Excavations at Lavin Tepe revealed Dalma pottery from strata III to strata VII. Hejebri Nobari and colleagues suggested that Lavin Tepe could bridge the chronological gap between the Neolithic and Dalma periods in northwest Iran, as a gradual transition from the Late Neolithic to the Early Chalcolithic is observable in its stratigraphy (Hejebri Nobari et al. 2012). Despite the significance of this site in pinpointing the emergence of the Dalma culture in the region, radiocarbon dates from Lavin Tepe have not yet been published.

Abedi's excavations at Kul Tepe and Dava Göz proposed a chronology of 5400 to 5000 BCE for Hasanlu X, 5000 to 4500 BCE for Hasanlu IX, and 4500 to 4200 BCE for Hasanlu VIII (Abedi et al. 2014, 2015, tab. 1). Radiocarbon analysis of Kul Tepe revealed dates between 5000 and 4500 BCE for its Dalma layers. Recently, Abedi has proposed a new chronological phase for northwestern Iran, positioned between the Hajji Firuz and Dalma periods, which he has termed the Late Late Neolithic/Formative Dalma. He dates this phase to 5400/5300–5000 BCE (Abedi 2023).

In the Central Zagros, the Dalma period, referred to as Godin X or the Dalma period, corresponds to the Early-Middle Chalcolithic. Various scholars have proposed different dates for this period. Levine and McDonald dated the onset of the Dalma period in the Kangavar plain to 4100 BCE (Levine and McDonald 1977). Henrickson suggested that the Dalma period in the Central Zagros did not precede 4100 BCE, with Dalma ceramic traditions in southern Azerbaijan, eastern Kurdistan, and northeastern Luristan reaching their peak between 4100 and 3700 BCE (Henrickson 1985, 70). Young and Levine proposed relative dates of 4500–4000 BCE based on excavations at Seh Gabi (Young and Levine 1974). Absolute dating at the Soha Chay site in Zanjan provided a timeframe of 4252 to 4038 BCE for the site (Rahimi 2008, 193). The site of Kalanan is another site in the central Zagros attributed to the Dalma period. Three absolute dating samples indicate a time range of 4042 to 3660 BCE for layers 2 to 8 of this site. Based on this, Saed

Table 1. Radiocarbon dates for the Belachak 3 site, the calibration is based on OxCal v4.4.4

Trench	Context	Sample code	Laboratory code	Radiocarbon age (BP)	Calibrate BCE OxCal v4.4.4	Material
A	105	Bla- 1	Poz-150983	5880 ± 40 BP	95.4% probability 4846 (93.4%) 4657 cal BC 4636 (2.0%) 4616 cal BC	Animal bone
A	104	Bla- 2	Poz-150968	5860 ± 40 BP	95.4% probability 4836 (3.8%) 4812 cal BC 4804 (91.6%) 4610 cal BC	Animal bone
B	203	Bla- 3	Poz-150969	5975 ± 35 BP	95.4% probability 4985 (1.1%) 4973 cal BC 4953 (91.7%) 4780 cal BC 4753 (2.7%) 4729 cal BC	Animal bone
B	201	Bla- 4	Poz-150970	6020 ± 40 BP	95.4% probability 5010 (95.4%) 4796 cal BC	Animal bone
A	101	Bla- 5	Poz-150973	5760 ± 35 BP	95.4% probability 4710 (92.7%) 4533 cal BC 4522 (2.7%) 4504 cal BC	Animal bone

Mucheshi suggests that the Dalma period in this part of the central Zagros falls between the late fifth millennium and the first half of the fourth millennium BCE (Saed Mucheshi et al. 2011).

Motarjem and Sharifi, based on excavations at Qeshlaq Tepe and thermoluminescence analysis, estimated the beginning of the Dalma period to be between 5500 and 5000 BCE. They argued that the Dalma culture persisted in this region for approximately 1000 years. They also suggested that the Dalma culture originated from communities familiar with the Hajji Firuz and Halaf traditions (Sharifi and Motarjem 2018). Zamani Dadaneh introducing findings from Narmashir Tepe, proposed a timeframe of 5300 to 4600 BCE for the Dalma period, though no radiocarbon dates were provided, and their basis for extending the Dalma period back to 5300 BCE remains unclear (Zamani Dadaneh et al. 2021, 19).

Renette and Mohammadi Ghasrian, in their chronological table, suggested that the beginning and end of the Dalma period in northwest Iran and eastern Central Zagros occurred simultaneously during the first half of the 5th millennium BCE (Renette and Mohammadi Ghasrian 2020, tab. 1). In subsequent publications, Renette correlated the Dalma period with the Late Ubaid (Ubaid 3–4) and, based on Mesopotamian absolute timelines, proposed that the Dalma tradition emerged in the late 6th millennium BCE and persisted until at least the mid-5th millennium BCE (Renette 2022).

The latest absolute chronology comes from Nad Ali Beig Tepe, analyzed by Bahranipoor, who used cultural materials and 15 radiocarbon analyses to suggest a timeframe of 5000 to 4600 BCE for the site. Since one meter of lower stratigraphy at Nad Ali Beig has not been dated, Bahranipoor proposed 5200/5100 BCE as the earliest date for the Dalma period in the Central Zagros, considering the possibility that Nad Ali Beig might not represent the earliest Dalma settlement in the region (Bahranipoor 2023).

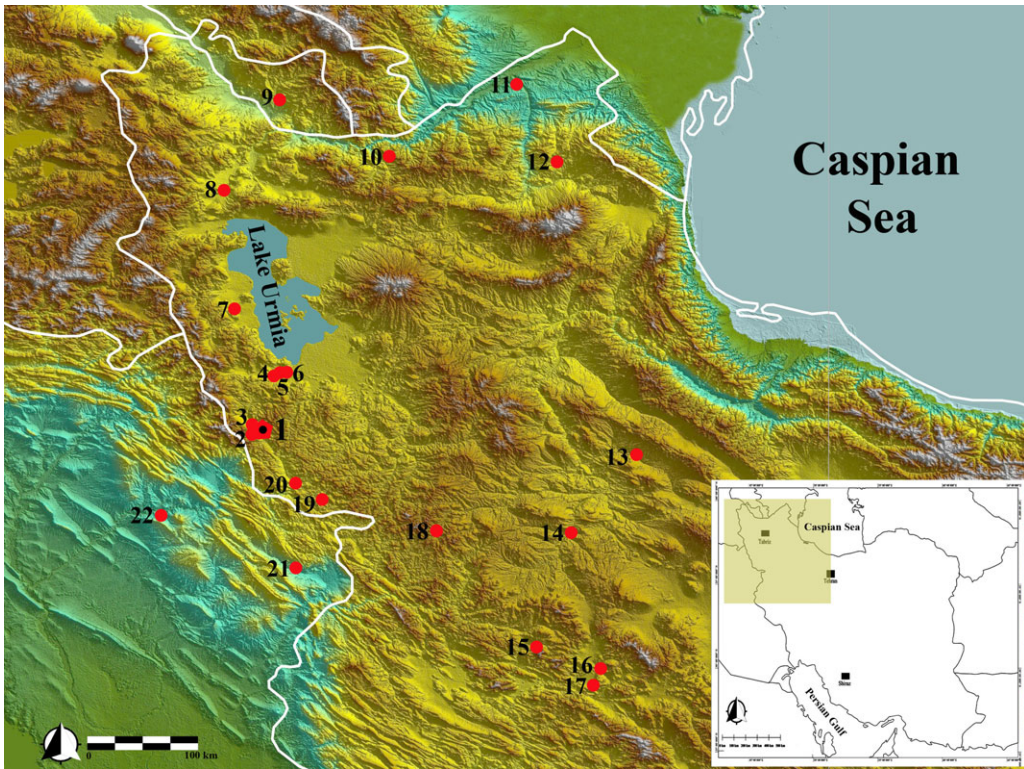


Figure 1. Location of the Belachak 3 site and sites as discussed in the text. 1. Belachak 3 site; 2. Girdi Sheytan; 3. Lavin; 4. Tappeh Dalma; 5. Hasanlou; 6. Pisdeli; 7. Seavan; 8. Dava Göz; 9. Nakhchivan Tappeh; 10. Kul Tepe; 11. Idier; 12. Ghosha Tape; 13. Soha Chay; 14. Qeshlagh; 15. Nad Ali Beig; 16. Seh Gabi; 17. Godin; 18. Kalnan; 19. Namshir; 20. Baqi; 21. Kani Shaie; 22. Surezha.

Belachak 3 site

The Belachak 3 site is located in the little Zab River basin, approximately 1 kilometer north of Lavin village, in Piranshahr County, northwest Iran (Figure 1). This site measures 30×25 m and is situated at an altitude of 1373 meters above sea level. The area has been impacted by the construction of the Kani Sib Dam, which prompted a survey of archaeological sites at risk due to the dam's reservoir by Reza Heydari in 2017 (Heydari 2017). Among the prehistoric sites identified during the survey was the Belachak 3 site. Given that the site would be submerged once the dam's reservoir was filled, a rescue excavation was conducted by the first author of this article in 2020.

During the excavation, two trenches measuring 5×5 (Trench 1) and 3×5 m (Trench 2), as well as two test trenches measuring 2×2 m, were excavated (Figure 2). The cultural deposits at the site reached a depth of 60 cm. Due to the small size of the site, the absence of architectural structures, and the presence of heat-altered deposits (such as hearths), it can be inferred that Belachak 3 was used as a temporary settlement during the Dalma period. Some researchers associate the expansion of the Dalma culture with nomadic communities (Henrikson and Vitali 1987; Solecki and Solecki 1973; Tonoike 2010). Thus, Belachak 3 can be considered evidence supporting the nomadic lifestyle of communities during this period.

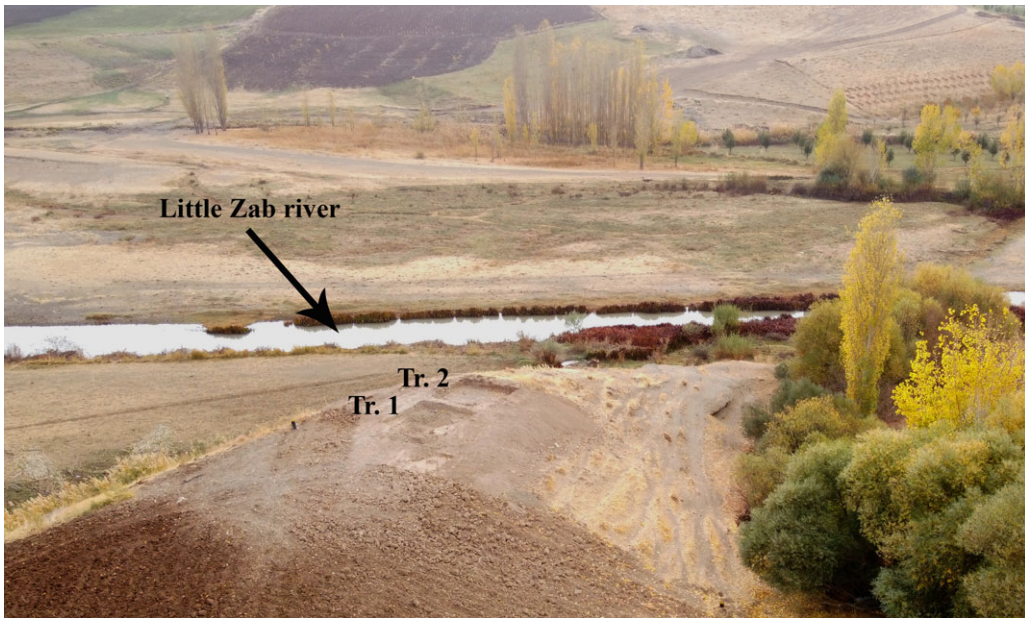


Figure 2. Aerial photo of Belachak 3 site.

Relative chronology and ceramic typology of Belachak 3

In archaeological studies, pottery is commonly used to establish relative chronology and delineate the geographical extent of each culture. During the excavation of the Belachak 3 site, an initial relative chronology was proposed based on ceramic findings. Several researchers have previously studied Dalma period ceramics, typically categorizing them into four groups: plain, painted, red-slipped, and surface-manipulated (Hamlin 1975, 117–120; Henrickson 1985, 69–70; 1986, 91–93; Levine and Young, 1987, 21; Tonoike 2010, 29–33; 2012, 66–68; Zeynivand et al. 2013, 41–44).

For the classification of ceramics at Belachak 3, we adopted a system based on color and decoration. Using this approach, the pottery from this site was divided into twelve categories: plain buff, painted buff, incised buff, impressed buff, buff with red slip, plain red, painted red, incised red, impressed red, streaked, applied Red and red-slipped wares (Figure 3). The decorations are predominantly geometric, featuring motifs such as zigzag lines, filled triangles, and hatched lozenges, painted in black or red. Negative painting, where designs appear through the contrast between the painted background and unpainted motifs, was also observed on a few sherds. While most decorations are on the exterior surfaces, occasional interior decorations were noted.

The pottery was hand-made, and some sherds are gray due to insufficient firing. Most surfaces are well-smoothed. Straw temper marks are also visible on several pieces. The painted pottery resembles those from sites such as Dalma Tepe (Hamlin 1975; Young 1963, 39), Seawan Tepe (Solecki and Solecki 1973), Lavin Tepe (Hejri Nobari et al. 2012), Seh Gabi (Hamlin 1973; Henrickson 1985, their fig. 7), Bāqi (Falahian and Nazhati 2017), Namashir (Zamani Dadaneh et al. 2021, their figs 17–18), Qeshlaq (Sharifi and Motarjem 2018), Girdi Sheytan (Aghalari & Salimi, 2024) and Nad Ali Beig (Bahranipoor 2023, their fig 7). Pottery with impressed motifs has been found across a broader geographical range, including sites such as Kani Shaie, and Surezha in Iraq (Alden et al. 2021; Renette 2022; Renette et al. 2021), as well as the sites mentioned above. All these ceramics are attributed to the Dalma culture. Since all Dalma ceramic types were identified at Belachak 3, and the site lies within the core region of this culture, it can be confidently attributed to the Dalma culture.

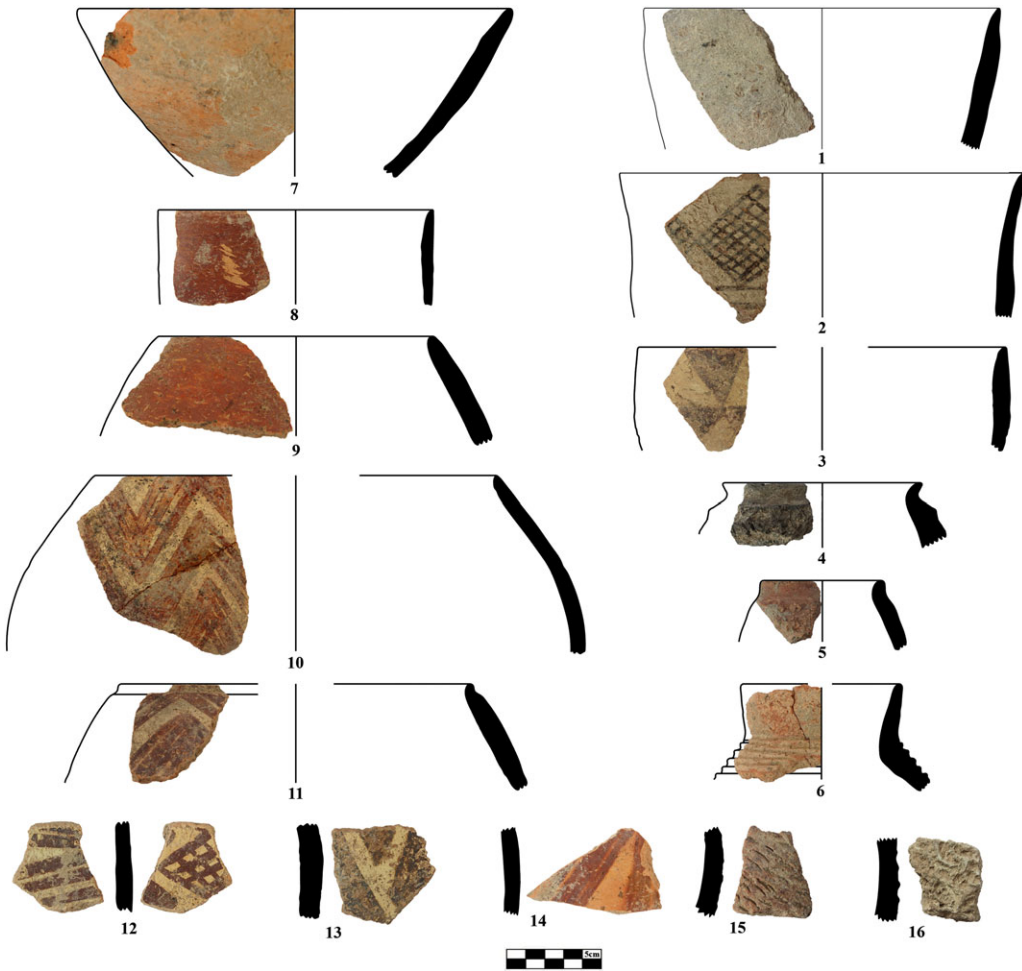


Figure 3. Pottery from Belachak 3 site.

Absolute chronology of the Belachak 3 site using accelerator mass spectrometry

During the excavation of the Belachak 3 site, no suitable charcoal samples were discovered for radiocarbon dating. As an alternative, five animal bone samples were selected and sent to the Poznań Radiocarbon Laboratory in Poland for ¹⁴C analysis. Based on a detailed analysis of the pottery assemblage found from various excavated contexts at the Belachak 3 site, it has been determined that the entire occupational sequence belongs to the Dalma period. The homogeneity of pottery types across all contexts indicates a short-term, single-phase occupation, allowing for a confident correlation between the stratigraphic layers and the absolute chronology associated with the Dalma culture.

In Trench 1, three bone samples were selected from well-stratified and in situ layers: Sample 1 was obtained from Context 105 (Bla-1), the deepest layer in this trench, at a depth of 61 cm. Sample 2 was collected from Context 104 (Bla-2), situated at a depth of 39 cm. Notably, a hearth and a thermally altered structure were found in association with these contexts, suggesting that the deposits have remained undisturbed since their original use during the Dalma period. This enhances the reliability of the radiocarbon dates associated with these samples. Sample 5 was taken from Context 101 (Bla-5), the uppermost well-preserved layer in the trench, at a depth of 13 cm (figure 4). Together, these three samples provide a vertical chronological sequence representing the full depth of Dalma-period occupation in Trench 1.

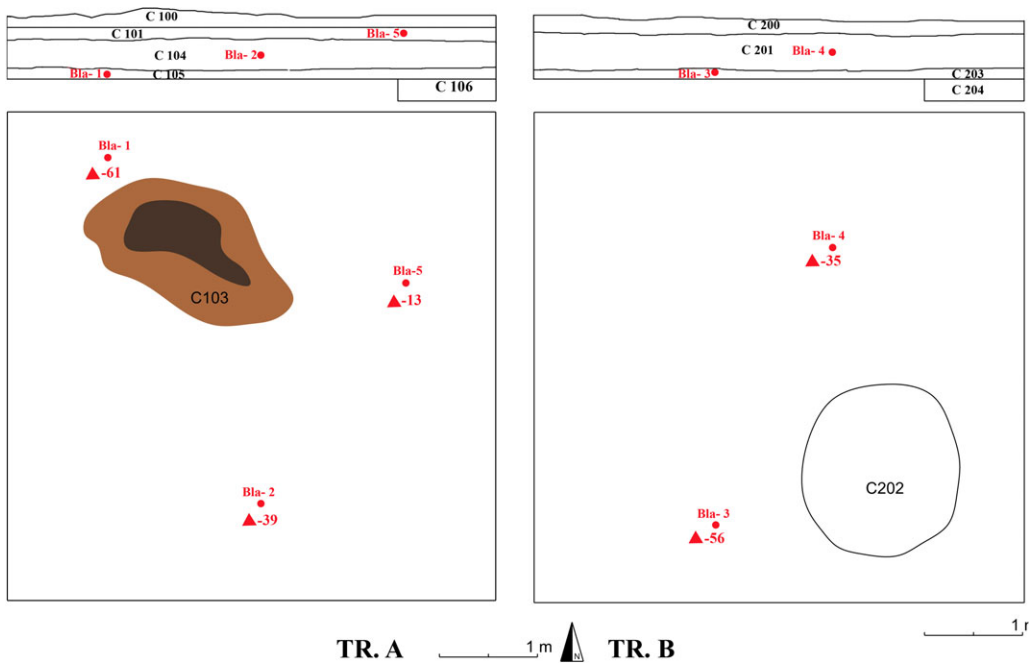


Figure 4. The location of the analyzed samples in the plan and section of Trenches 1 and 2 at the Belachak 3 site.¹

To further refine the chronology, two additional samples were collected from Trench 2: Sample 3 was obtained from Context 203 (Bla-3), which rests directly on virgin soil and represents the earliest occupation layer in this trench, at a depth of 56 cm. Sample 4 was taken from Context 201 (Bla-4), which directly overlies Context 203, at a depth of 35 cm (Figure 4). As emphasized above, the site's single-period occupation ensures that these radiocarbon dates, derived from securely stratified contexts, provide a robust and refined chronological framework for the Dalma culture in this region.

All measurements at the laboratory were carried out using the MICADAS system, which employs compact AMS technology and ensures high-precision analysis of small carbon samples (Stuiver and Polach 1977). The bone samples underwent pretreatment to isolate collagen, following protocols optimized for archaeological specimens. The procedure involved demineralization of the bone matrix in dilute hydrochloric acid (HCl) to remove the inorganic components, followed by multiple rinses with ultrapure water. Alkali treatment (NaOH) was applied when necessary to eliminate humic acids and other potential contaminants. The samples were then gelatinized in a weakly acidic solution at elevated temperature (typically 58–60°C), filtered to remove particulates, and freeze-dried to obtain purified collagen (<https://radiocarbon.pl/en/about-radiocarbon/>).

The extracted collagen was combusted to CO₂, which was then converted to graphite using the hydrogen reduction method with iron as a catalyst. The resulting graphite targets were pressed into aluminum holders and loaded into the MICADAS (Mini Carbon Dating System) AMS instrument. Radiocarbon measurements were performed using standard operating conditions, and the ratio of $^{14}\text{C}/^{12}\text{C}$ was determined for each sample. Stable carbon isotope ratios ($\delta^{13}\text{C}$) were measured to correct for isotopic fractionation and to assess the quality of collagen. All radiocarbon dates were calibrated using the OxCal v4.4 software (<https://c14.arch.ox.ac.uk/oxcal/OxCal.html#>) and the IntCal20

¹ “C” is the abbreviation for “Context,” and each number following it refers to a specific stratigraphic layer or architectural feature identified during excavation. “Bla” refers to the site name, Belachak, and the number that follows indicates the radiocarbon sample number. The number next to each red triangle in Figure 4 represents the depth (in centimeters) at which each radiocarbon sample was taken.

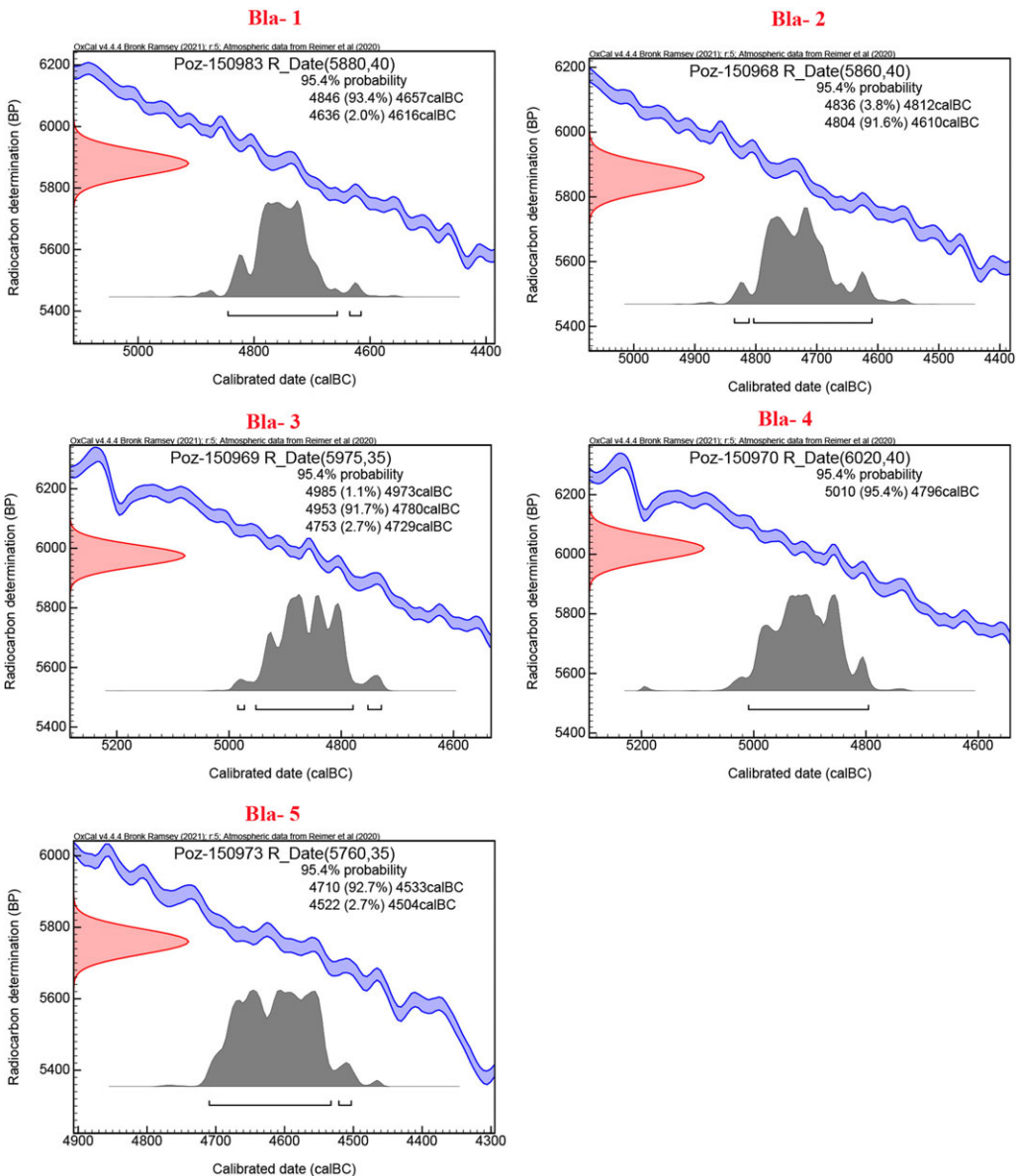


Figure 5. ^{14}C radiocarbon dates of Belachak 3.

calibration curve (Reimer et al., 2020). Calibrated age ranges are reported at the 95.4% probability level (2σ). The calibrated results range from approximately 5000 to 4700 BCE (see Table 1; Figures 5 and 6), firmly situating the site's occupation within the Dalma period. These radiocarbon dates, in conjunction with ceramic typology and stratigraphic observations, support the interpretation of Belachak 3 as a short-term seasonal settlement during this period.

Evaluation of Dalma period chronology based on absolute dating

As discussed above, it can be stated that even after several decades of research on the Dalma period, no consensus has yet been reached regarding its chronology. Reviewing various articles reveals significant

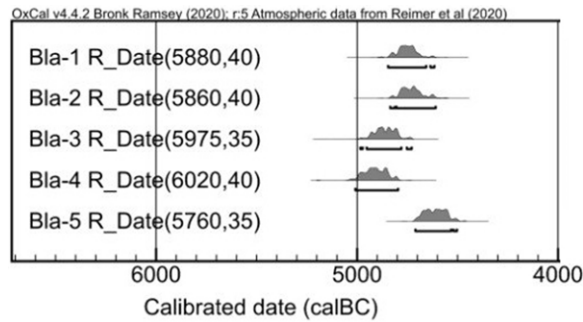


Figure 6. Calibrated radiocarbon dating for the Belachak 3.

confusion about the dating of this period. This lack of clarity stems from the absence of laboratory-based dating methods for many sites and the inadequate definition of Dalma ceramics. For the chronological study of the Dalma period, four types of sites can be identified:

1. Excavated sites with only relative absolute dating, such as Lavin Tepe and Namashir Tepe.
2. Sites with outdated absolute chronology, where newer analyses suggest inaccuracies, such as Dalma Tepe.
3. Sites associated with the Dalma culture, where some ceramics resemble Dalma types but do not represent the full Dalma assemblage (e.g., Surezha), or their ceramics significantly differ from Dalma (e.g., Soha chay and Kul Tepe).
4. Sites with all types of Dalma ceramics, along with updated absolute dating, such as Nadi Ali Tepe in central Zagros and Nahçivan Tepe in the southern Caucasus.

To date this ceramic culture, it is essential first to define the Dalma period and identify the characteristics that qualify a site as Dalma. The Dalma culture is distinguished by its ceramics, which are markedly different from those of neighboring regions. According to Hamlin's classification (Hamlin 1975), Dalma ceramics are categorized into four main types. If this entire ceramic assemblage is found at a site, it can be attributed to the Dalma culture. However, if only some types coexist with distinct ceramics, such sites should be considered related to Dalma, as Renette has effectively categorized into Dalma and Dalma-related sites (Renette 2022).

During excavations at Kul Tepe (Abedi et al. 2014), painted red ceramics were discovered from phase VIII, with an absolute date ranging from 5000 to 4500 BCE. Consequently, the site was attributed to the Dalma period by its excavator. However, no impressed wares were found, and the motifs on the painted ceramics differ significantly from Dalma ceramics. Therefore, Bahranipoor suggests that this site does not belong to the Dalma period (Bahranipoor 2023). Soha Chay (Rahimi Sorkhani and Eslami 2018) is another site attributed to Dalma, with an absolute date in the last quarter of the 5th millennium BCE. However, Bahranipoor argues that the ceramics of this site correspond to Godin VII rather than the Dalma period (Bahranipoor 2023). Another site attributed to the Dalma period is the Kalanan site. The excavator of this site stated that no painted pottery from the Dalma period was found, and only a few sherds with impressed decorations were discovered, based on which the site was attributed to the Dalma period (Saed Mucheshi et al. 2011). Contrary to the excavator's opinion, since the majority of the pottery from this site significantly differs from Dalma pottery, it cannot be attributed to the Dalma period. Considering the ceramic evidence and absolute dating, this site should instead be associated with Godin VII.

Abedi, based on the chronology of Dava Göz, proposed a formative phase for Dalma and claimed that its origins should be pushed back to 5400/5300 BCE (Abedi 2023). While this hypothesis may be valid, as Abedi has not published images of the ceramics from this phase, it remains unclear whether they resemble Dalma ceramics from sites such as Dalma Tepe or Kul Tepe. If they are similar to those from Kul Tepe, they cannot be considered representative of Dalma's formative phase. Abedi also

references the findings from Idier Tepe and Ghosha Tepe to support his hypothesis. However, these sites lack absolute chronology analyses and may instead be categorized as Dalma-related sites.

The ceramics of Kul Tepe (Abedi et al. 2014, 2015), Ghosha Tepe (Derakhshi and Hejebri Nobari 2009), and Idier Tepe (Hessari 2019) suggest the possibility of a distinct ceramic culture in the eastern Lake Urmia region, which shared significant cultural connections with Dalma. While some ceramics resemble Dalma types, others show considerable differences.

Three sites—Nahçivan Tepe in the southern Caucasus, Belachak 3 southwest of Lake Urmia, and Nadi Ali Beig in the central Zagros—have yielded complete Dalma ceramic assemblages and demonstrate cultural similarities. Their absolute chronologies provide reliable benchmarks for the Dalma period. The complete Dalma ceramic assemblage found at Belachak 3 confirms its association with this period, leaving no doubt about its attribution. Its results contribute to the absolute chronology of the Dalma period southwest of Lake Urmia, indicating its prevalence in this region during the first half of the 5th millennium BCE (approximately 5000–4700 BCE). However, since this site was temporarily occupied and lacks settlement continuity, it may not represent the earliest Dalma sites. Nevertheless, it confirms the presence of the Dalma culture in this area in the first quarter of the 5th millennium BCE. The chronology of Belachak 3 suggests that the Dalma culture was widespread in the northwest during the first half of the 5th millennium BCE, and the absolute chronology of Dalma Tepe (Hamlin 1975) cannot be accurate. The radiocarbon results from Dava Göz also support this, as Pisdeli ceramics were common in the region during the second half of the 5th millennium BCE (Abedi et al. 2015).

At Nahçivan Tepe, four occupational phases have been identified. Phases II and III, associated with the Chalcolithic and concurrent with the Dalma period, yielded radiocarbon dates of 4720–4529 BCE and 4945–4722 BCE, respectively. Although Phase IV was initially attributed to the Neolithic and compared to Hajji Firuz ceramics, later dating reassigned it to the Dalma period (Bahşeliyev 2021).

The results from Nadi Ali Beig are critical for Dalma chronology in the central Zagros. Radiocarbon analysis of 15 samples dates the Dalma occupation at this site to 5000–4600 BCE. Since approximately one meter of its lower layers remains undated, it has been suggested that the Dalma period in the central Zagros began around 5200/5100 BCE (Bahranipoor 2023).

The ceramic assemblages from Belachak 3, Dalma (Hamlin 1975), Nadi Ali Beg (Bahranipoor 2023), and other Dalma sites indicate that while the four primary types of Dalma ceramics in the northern and central Zagros are similar, regional variations exist. For example, bichrome and polychrome ceramics, as well as black-on-buff wares found in the central Zagros, are absent in the northern Zagros. Additionally, although the overall ceramic repertoire of Dalma sites is consistent, the frequency of ceramic types varies across regions.

Conclusion

During the salvage excavation at the Belachak 3 site, evidence of the Chalcolithic period was identified. Based on its limited area, lack of architecture, and remaining cultural deposits, the site is interpreted as a temporary settlement. Some researchers suggest that small groups of nomadic shepherds seasonally migrated between scattered villages, acting as intermediaries in the distribution of goods such as obsidian and pottery. In light of this, Belachak 3 might have served a similar purpose. The discovery of several obsidian pieces at the site further suggests connections with the southern Caucasus region or Anatolia region.

A variety of pottery was recovered from the site, identified in Iranian archaeology as part of the Dalma culture. This suggests that the Belachak community consisted of nomadic people who occupied the region seasonally, likely during spring or summer. Given the area's cold climate and snowfall, it is unlikely that the site was used during the winter months.

The radiocarbon results from this site indicate that the Dalma culture was prevalent in this region at least from 5000 to 4700 BCE. Considering the results from other sites, it can be suggested that this culture emerged in the late 6th millennium BCE, and the period from 5000 to 4500 BCE can be considered the time frame for the prevalence of the Dalma period in Iran. During this time, extensive

cultural interactions existed between communities in the Central and Northern Zagros and the southern Caucasus, reflecting a broad network of cultural connectivity.

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