

## Assessing the Origins, Symbolic Significance, and Social Meaning of Dalma-Type Impressed Pottery on the Basis of Evidence from Nakhchivan and Karabakh

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### Abstract

The impressed pottery of the Dalma tradition was distributed across a wide area extending from the Urmia Basin to the South Caucasus during the fifth millennium BCE. However, the mechanisms underlying this distribution remain insufficiently understood. The Late Neolithic layer uncovered during the 2019 excavations at Nakhchivan Tepe provides an opportunity to reassess this issue. At Nakhchivan Tepe, impressed pottery was recorded stratigraphically prior to painted pottery, a sequence that differs significantly from the classical Dalma stratigraphy. Petrographic and archaeometric analyses indicate the coexistence of stylistic homogeneity and raw material variability. This suggests that the spread of this pottery tradition was associated less with the exchange of finished products than with the transmission of technological knowledge. Radiocarbon dates from Neolithic sites in the Karabakh-Mil Plain indicate an earlier presence of this tradition in the South Caucasus than in the Urmia Basin. These results support a multi-centred model involving Karabakh, Nakhchivan, and the Urmia Basin.

**Keywords:** *Dalma, impressed pottery, Nakhchivan Tepe, Karabakh-Mil Plain, Neolithic, cultural transmission, South Caucasus.*

### Introduction

Dalma Tepe pottery was first identified at the site of Dalma Tepe in the Urmia Basin of northwestern Iran (Young, 1962, pp. 707-709; Young, 1963, pp. 38-39; Hamlin, 1975, p. 111). During the initial investigations, Young suggested that this culture might not be indigenous to the region (Young, 1962, p. 709). According to Henrickson's typological classification, the pottery is divided into three principal categories: plain ware, impressed ware, and painted ware. Plain ware is further subdivided into slipped-burnished, slipped-unburnished, and unslipped-unburnished groups, while red-slipped pottery is treated not as an independent category but as a subtype within

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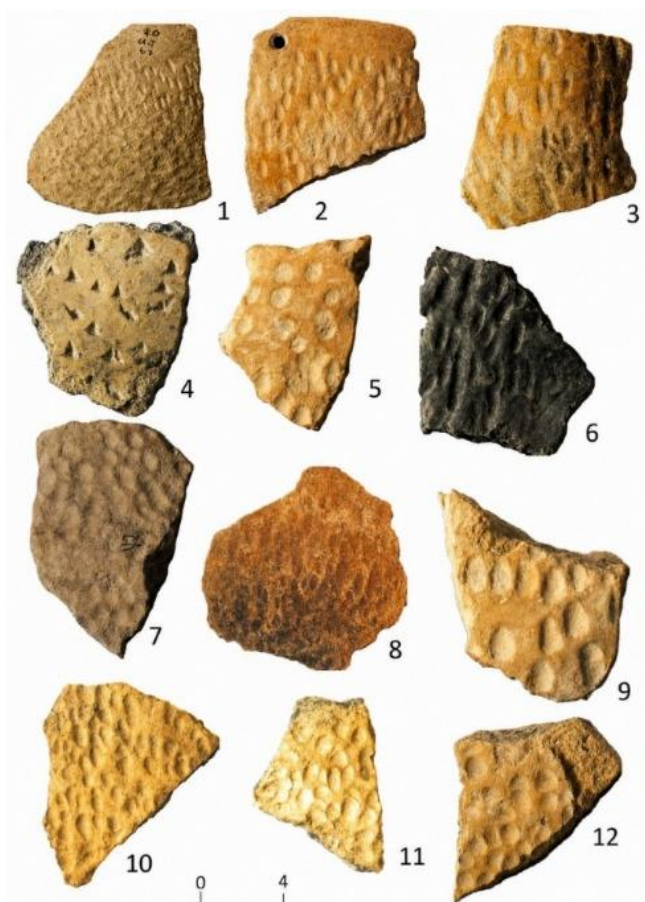
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this ware. Painted ware includes monochrome, bichrome, and banded variants. Impressed ware is characterized by finger impressions, fingertip impressions, and designs executed with reed or bone tools. However, the coverage of the entire exterior surface of vessels by such motifs is not a defining characteristic of all subgroups within this category (Henrickson, 1983, pp. 110-111, 185-186, 196-198).

Previous studies have argued that the principal core of the Dalma Tepe Culture emerged in the Urmia Basin and the northern Zagros region, from where pottery associated with the Dalma tradition spread into various parts of western Iran, the Trans-Tigridian region, Iraqi Kurdistan, and the South Caucasus (Abedi et al., 2015, pp. 321-322; Henrickson & Vitali, 1987, p. 37; Renette, 2022, pp. 114-115). Subsequent research has demonstrated the wide distribution of the Dalma Tepe Culture throughout northwestern Iran and its presence at numerous settlements in Iranian Azerbaijan (Bakhshaliyev et al., 2018, p. 23).

**Fig. 1** Impressed pottery from Ilanlitepe (Akhundov 2017).



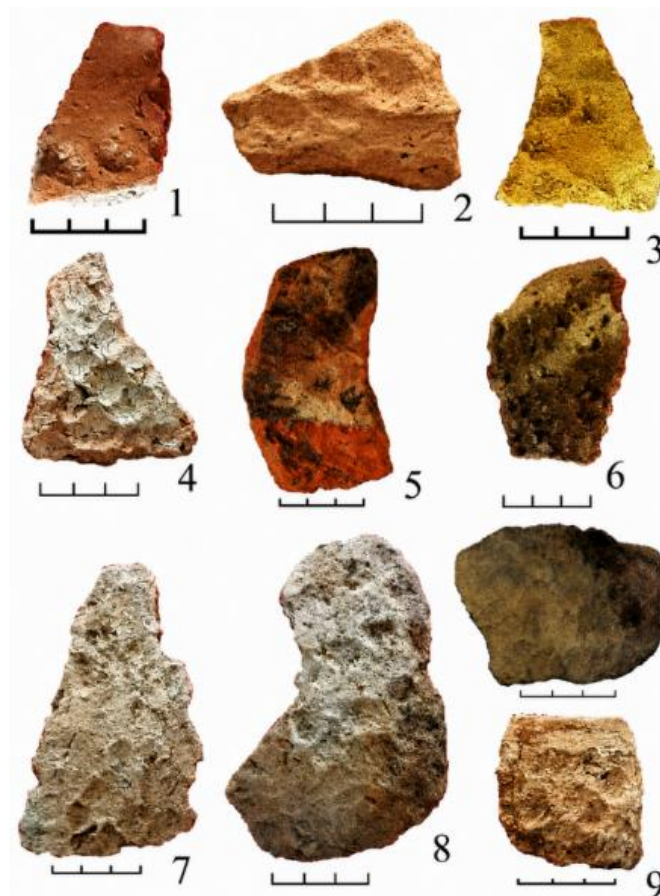
More recent studies, however, have suggested that the formative area of the culture included Karabakh (Fig. 1), Nakhchivan, and the Urmia Basin (Bakhshaliyev, 2020, p. 46; Bakhshaliyev, 2023, pp. 194-195). Excavations conducted at the settlement of Nakhchivan Tepe in 2019



identified impressed pottery within a Neolithic layer, providing an opportunity to reassess the connections between the Mil Plain, Karabakh, and the Urmia Basin (Bakhshaliyev & Bakhshaliyev, 2020, p. 57). Based on the results of these investigations, it has been argued that the impressed-pottery sites of the Mil Plain and Karabakh played an important role in the formation of the Dalma Tepe Culture.

At Nakhchivan Tepe, impressed pottery was documented in the lowest layers (Fig. 2). This was followed by red-slipped plain pottery and subsequently by geometrically painted pottery of the Dalma type. Such a stratigraphic sequence differs from the classical Dalma stratigraphy known from the Urmia Basin and Kangavar and raises new questions concerning the position of the impressed pottery tradition within the Dalma ceramic complex. Research conducted during the last decade has shown that the formative phase of the Dalma Tepe Culture predates the classical Dalma sites of the Urmia Basin and that its roots can be traced to the Late Neolithic cultures of Nakhchivan and Karabakh (Bakhshaliyev & Bakhshaliyev, 2023, pp. 17-18, 23). These results have generated new discussions concerning the formation of the Dalma Tepe Culture and the origins of its ceramic traditions.

**Fig. 2** Impressed pottery from the Late Neolithic level at Nakhchivan Tepe (Bakhshaliyev 2020).



### Archaeological and Archaeometric Evidence

The Dalma ceramic complex is best documented at Dalma Tepe in the Urmia Basin and at Seh Gabi Mound B and Godin Tepe Op. XYZ in the Kangavar Valley. It is characterized by the co-occurrence of impressed and painted pottery groups (Henrickson, 1983, pp. 178-202, 473-474). At Tepe Qishlaq, impressed, incised, and painted pottery assemblages likewise occur together. At the same time, painted pottery constitutes only a limited proportion of the overall assemblage, whereas the principal ceramic complex consists of impressed and incised wares characteristic of the Dalma tradition (Motarjem & Sharifi, 2014, pp. 57-60). In contrast, at settlements in the Trans-Tigridian region and the western-central Zagros that have been associated with the Dalma Tepe Culture, Dalma-type pottery forms only a limited component of the overall ceramic assemblage and stands out as a non-local element. At these sites, Dalma materials are represented primarily by impressed wares, which occur in higher proportions than painted pottery (Alden et al., 2021, p. 6; Renette, 2022, p. 116).

**Fig. 3** Dalma impressed pottery (Alden et al. 2021).



Analysis of the material from Dalma Tepe indicates that painted pottery was more common in the earlier levels, whereas impressed pottery (Fig. 3) became increasingly prevalent in the later



strata (Alden et al., 2021, p. 5). Renette has likewise noted that Dalma painted pottery was largely restricted to the Northern Zagros, while impressed pottery had a considerably wider geographical distribution (Renette, 2022, p. 114). From this perspective, the predominance of impressed wares in the Trans-Tigridian region and the western-central Zagros may indicate an association with the relatively later phases of the Dalma tradition.

The comparative table presented below synthesizes published excavation data and previous research concerning the stratigraphic distribution of the principal ceramic groups at settlements associated with the Dalma Tepe Culture. The data presented are based on the assessments provided in the published studies (Table 1).

**Table 1.** Stratigraphic distribution of ceramic groups at settlements associated with the Dalma Tepe Culture.

Site	Geographic Region	Painted Pottery	Impressed Pottery	Red-Slipped Ware	Plain Ware	Reference
Dalma Tepe	Urmia Basin	Dominant during the early phase	Increases during later phases	Present	Present	Hamlin 1975
Seh Gabi / Godin X	Kangavar Valley	Present during the early phase (monochrome)	Increases during later phases	Present	Present	Henrickson 1983
Nad Ali Beig	Central Zagros	Linear motifs during the early phase; complex geometric motifs during later phases (monochrome)	Increases during later phases	Present	Present	Bahranipoor 2021
Soha Chay Tepe	Zanjan, Iran	Dominant during the early phase	Increases during later phases	Present	Present	Rahimi Sorkhani et al. 2016
Surezha	Erbil Plain (Iraq)	Continues in high percentages throughout LC1 as a continuation of the Ubaid tradition	Dalma-type impressed examples occur only in the upper (late) LC1 levels	Not reported	Present	Stein & Fisher 2020
Kani Shaie	Bazyan Basin,	Present during the early	Present during the	Appears from	Present	Renette et al. 2021



	Southern Iraqi Kurdistan	phase (Late Ubaid), decreasing during later phases	early phase (Late Ubaid), absent in LC1	LC2 onward		
Nakhchivan Tepe	Nakhchivan Autonomous Republic, Azerbaijan	Rare during the early phase, increasing during later phases	Dominant during the early phase	Present	Present	Bakhshaliyev 2020; Bakhshaliyev and Bakhshaliyev 2023
Neolithic Sites of Karabakh (Ilanlitepe, Ismayilbeytepe, Chalagantepe, Kamiltepe, etc.)	Mil-Karabakh Plain	Rare, mainly appearing during later phases	Present from the early phase and becoming widespread and standardized during later phases	Present	Present	Narimanov 1987; Akhundov 2017; Almammadov 2018

The data presented in the table indicate that the proportions of ceramic categories are not uniform across settlements associated with the Dalma tradition. At Surezha, painted pottery continues in high frequencies throughout LC1 and is characterized as a continuation of the Ubaid tradition. Impressed pottery, by contrast, is represented only in the later LC1 levels and occurs in limited quantities of Dalma-type examples. At Kani Shaie, both painted and impressed pottery are present during the earlier phase (Late Ubaid). In subsequent phases, painted pottery decreases, whereas impressed pottery disappears entirely during LC1.

The evidence from the South Caucasus presents a different pattern. At Nakhchivan Tepe, impressed pottery predominates during the earlier phase, while painted pottery is present only in small quantities and increases only in later phases. A similar trend can be observed at the Neolithic settlements of Karabakh. There, impressed pottery is present from the earlier phase and becomes more widespread and standardized in subsequent phases, whereas painted pottery occurs in limited quantities and is largely confined to the later phase. This parallel may suggest that the early predominance of impressed pottery constituted a regional trend in the South Caucasus, although additional stratigraphic evidence is required to evaluate this interpretation further.

A comparative table of radiocarbon dates obtained from the Karabakh-Mil Plain settlements (Table 2) provides the chronological framework for this sequence.



**Table 2.** Radiocarbon Dates from the Karabakh-Mil Plain Settlements, Nakhchivan Tepe, and Kul Tepe (Iran).

No.	Site	Sample ID	Radiocarbon (BP)	Date BC (95.4%)
1	Goytepe (Karabakh)	LAAA-141125	6385±30	5486-5391 BC
2	Goytepe (Karabakh)	LAAA-120067	6610±30	5617-5490 BC
3	Ismayilbeytepe (Karabakh)	R3	6700±80	5730-5450 BC
4	Ismayilbeytepe (Karabakh)	R5	6650±80	5710-5480 BC
5	Nakhchivan Tepe	LTL19695A	6102±45	5209-4930 BC
6	Nakhchivan Tepe	LTL19694A	6028 ± 45	5038-4799 BC
7	Nakhchivan Tepe	LTL19693A	5967 ± 45	4959-4725 BC
8	Julfa Kultepe (Iran)	LTL13047A	5647 ± 50	4600-4350

This observation gains greater significance when considered together with the results of archaeometric investigations. One of the principal issues in the study of the Dalma ceramic tradition concerns the distinction between stylistic similarity and production origin. Petrographic and INAA analyses conducted on the Surezha material have demonstrated that Dalma-type pottery shows close similarities in form and decorative characteristics to the Dalma assemblages of the Urmia Basin, while at the same time being produced from local clay sources. This result indicates that the spread of the Dalma style was related less to the exchange of ceramic vessels than to cultural influence or the transmission of technological traditions (Stein & Fisher, 2020, pp. 144-145). Similar results have been obtained through petrographic studies of material from Seh Gabi, Godin Tepe, and Tepe Siahbid. Although similar in appearance, the Dalma-type pottery from these three settlements has been identified as local production. The igneous and metamorphic clay sources used in the Eastern Central Zagros (Seh Gabi and Godin Tepe) differ from the calcareous clay sources of the Western Central Zagros (Tepe Siahbid). This indicates that it was not the pottery itself, but rather the method of its production, that was transmitted by communities associated with the Dalma tradition. At the same time, variability in local clay sources suggests that production took place at the household level (Hossein Mardi, 2025, p. 14).



Portable XRF analyses carried out by Rahimi Sorkhani and Eslami on the pottery from Soha Chay Tepe demonstrated that each ceramic style possessed a distinct chemical composition, reflecting different raw materials or recipes, while remaining compositionally homogeneous within each stylistic group (Rahimi Sorkhani & Eslami, 2018, p. 220). The authors interpret this pattern as indicating that changes in style were accompanied by changes in clay procurement and that potters made different production choices for different ceramic styles, regarding this as evidence for an early stage of craft specialization within the Dalma tradition (Rahimi Sorkhani & Eslami, 2018, p. 232). At the same time, by emphasizing that diagnostic Dalma pottery was not the product of long-distance exchange (Rahimi Sorkhani & Eslami, 2018, p. 222), they argue that this phenomenon was associated not with the large-scale trade of finished products but rather with local production and a shared material-cultural tradition.

### Theoretical Framework

The social significance of ceramic decoration has long been a subject of discussion within archaeology. Wobst argued that style may participate in the transmission of social information and noted that the formal characteristics of artefacts play a role in the expression of group identity and social relationships (Wobst, 1977, pp. 8, 18-21). Sackett, in turn, emphasized that style is manifested not only in decorative elements but also in technological choices, explaining this phenomenon through the concept of “isochrestic variation” (Sackett, 1986, pp. 268-270).

These approaches are of particular relevance for the interpretation of Dalma-type impressed pottery. Petrographic and archaeometric studies indicate that Dalma-type ceramics were produced from local raw materials in different regions while displaying a high degree of technological and decorative similarity. This situation suggests that it was not the pottery itself, but rather the method of production and the stylistic tradition that spread across the region.

This phenomenon may also be approached through the concept of communities of practice. Lave and Wenger characterized technological learning as a process of participation within social practices and argued that technological knowledge and production skills are transmitted through shared traditions of learning (Lave & Wenger, 1991, pp. 29-42, 89-98). In a subsequent study, Wenger noted that practical relationships established between communities may, over time, give rise to broader constellations of practices (Wenger, 1998, pp. 72-84, 126-131). Within archaeological research, this approach has been widely applied to explain the spread of ceramic production and technological knowledge (Roddick & Stahl, 2016, pp. 3-5).

The shared tradition of impressed decoration observed across Karabakh, Nakhchivan, and the Urmia Basin similarly allows for the possibility that a network of interconnected communities existed, based on local production while sharing common technological knowledge and traditions of learning. From this perspective, the wide geographical distribution of Dalma impressed pottery may be related less to the exchange of finished vessels than to the transmission of technological knowledge, social learning, and the expression of group identity. Although the currently available



evidence does not permit the identification of a specific religious or cosmological meaning for these motifs, it does indicate that they constituted socially meaningful stylistic choices.

The multifunctionality model proposed by David, Sterner, and Gavua demonstrates that ceramic decoration may fulfil a variety of social and symbolic functions. While some of these interpretations are theoretically possible within the Dalma assemblage, the available archaeological evidence does not directly support most of them. Consequently, the strongest support remains with a model of social identity and shared tradition that corresponds closely to the combination of local production and regional stylistic homogeneity observed in the archaeological record (Table 3).

**Table 3.** Functions of decoration according to the multifunctionality framework proposed by David, Sterner, and Gavua, and the level of supporting evidence for their application within the Dalma context.

<b>Function</b>	<b>Level of Evidence for Dalma</b>
Identification of the vessel with the human person and the representation of cosmological/religious concepts (anthropomorphic vessels, ancestor/goddess vessels; “pots are persons”)	Direct evidence depends on the presence of anthropomorphic vessels or associated figurative representations. The available Dalma evidence does not support this interpretation.
Protective function of decoration as an apotropaic device. The decoration protects the vessel or the individual from dangerous forces, creating a symbolic protective boundary. Red slip (red as a symbol of both power and protection).	No direct evidence exists. Authors emphasize that such meanings can only be approached through a rich ethnographic and cosmological context and cannot be demonstrated through archaeology alone. The impressed decoration found on vessels from Karabakh, Nakhchivan, and other Dalma-related contexts may have served a protective function; however, no direct evidence currently supports this interpretation.
Commemoration of culturally acquired abundance (thorn/horn motif, maray feast)	Dalma impressed decoration could theoretically represent abundance, but no direct evidence exists. As above, confirmation would require a broader cosmological or ritual context.



Mnemonic function: the everyday transmission of collective values and the reinforcement of social order; “restricted decoration” (“decoration is like prayer”, “every day at mealtimes”)	Consistent with the small-scale community structure of tribal groups and with the integration of decorated vessels into food preparation and consumption practices (indirectly supported).
Marking ritual status or exchange value (Kopytoff: commoditization-singularization scale; sacred versus market vessels)	No direct evidence is currently available for Dalma.
Indirect indicator of social identity	The paradox of stylistic homogeneity and local production (petrographic studies indicate local manufacture, while stylistic conventions remain regionally homogeneous) is strongly consistent with this interpretation.

This approach is more consistent with Wobst’s model of information exchange (Wobst, 1977, pp. 1-8), Sackett’s concept of isochrestic style (Sackett, 1986, pp. 268-269), and the symbolic-communicative interpretation of decoration proposed by David, Sterner, and Gavua (David et al., 1988, pp. 365-367). The available evidence therefore suggests that a model centred on social identity and shared tradition provides the most appropriate framework for the interpretation of Dalma pottery.

### Possible Meanings of Impressed Decoration

Petrographic and archaeometric studies indicate that Dalma-type pottery exhibits a high degree of similarity in terms of technological sequence and decorative principles despite being produced from different local raw materials in different regions. This situation suggests that the impressed decoration tradition was associated less with the distribution of finished products than with the sharing of production knowledge and learning practices. In this sense, technological similarities can be interpreted as indicators of sustained social interaction and cultural transmission between Karabakh, Nakhchivan, and the Urmia Basin (Wenger, 1998, pp. 4-7; Roddick & Stahl, 2016, pp. 3-6; Peeples, 2019, pp. 3-7; Brughmans & Peeples, 2023, pp. 34-35).

A second approach considers impressed pottery as an expression of social identity and group affiliation. The occurrence of impressed pottery across a wide geographical area with similar decorative characteristics raises the possibility that it functioned as a material expression of social identity and group membership (Wobst, 1977, pp. 12, 20-21; Pereira et al., 2023, p. 1). However, this interpretation does not represent a directly demonstrated conclusion but rather one of several possible explanations of the available evidence.

A third approach relates impressed pottery to the expression of a distinct identity by Dalma communities in relation to the social hierarchies emerging in Mesopotamia (Renette, 2022, pp.



111-112). Yet this hypothesis relies primarily on indirect arguments and is not directly supported by the currently available material. Furthermore, the possibility that certain components of the Dalma tradition emerged prior to these social transformations weakens the explanatory power of this interpretation (Renette, 2022, pp. 123-124). For this reason, it should presently be regarded as a possibility that requires additional supporting evidence.

The available evidence indicates that impressed decoration was not solely decorative in character and may have carried a certain symbolic significance. Considering the storage function of many vessels, it is possible that such motifs were associated with the protection of stored contents or with concepts related to fertility and abundance. On the basis of Neolithic Near Eastern evidence, ceramic decoration has been interpreted as a medium carrying social and mythological meanings (Campbell, 2010, pp. 152-154). Early pottery has frequently been associated with ritual and symbolic practices, while ornamentation has in some cases been explained in terms of an apotropaic function (David et al., 1988, pp. 365, 372; Vitelli, 1993, p. 215). Nevertheless, no anthropomorphic vessels, iconographic representations, or other forms of direct evidence are currently known from the Dalma ceramic tradition that would support such an interpretation. Consequently, protective or fertility-related symbolism can presently be considered only at the level of hypothesis.

The analyses discussed above indicate that the social and symbolic significance of Dalma-type impressed pottery may be explained at different levels. The currently available archaeological and archaeometric evidence does not support all interpretations to the same degree. While some explanations correspond more closely with the available empirical evidence, others remain theoretical possibilities that require further investigation. A comparative evaluation of these interpretations and their respective levels of epistemic reliability is summarized in Table 4.

**Table 4.** Proposed interpretations of impressed decoration and their epistemic status

<b>Interpretation</b>	<b>Main Content</b>	<b>Key References</b>	<b>Level of Evidence</b>
Technical transmission (learning networks / communities of practice)	The same decorative tradition is reproduced using different local raw materials. Knowledge is transmitted through direct learning processes.	Wenger 1998; Roddick & Stahl 2016; Peeples 2019; Brughmans & Peeples 2023	Supported by petrographic evidence
Conscious resistance to Mesopotamian hierarchy (“mountain identity”)	The interpretation is based primarily on indirect arguments. No direct archaeological	Renette 2022	Testable but weakly supported argument



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evidence is currently available.

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Protective / abundance symbolism	The vessel serves as a container, while decoration symbolically protects or reinforces the meaning of its contents. No direct iconographic evidence is currently available for the Dalma tradition.	Campbell 2010; Vitelli 1993; David, Sterner & Gavua 1988	No direct evidence is currently available. This interpretation may be evaluated through future research.
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### Stratigraphy of Nakhchivan Tepe and Its Relationship with the Karabakh Sites

The lowest architectural level representing the Late Neolithic phase at Nakhchivan Tepe was documented at a depth of 2.50-3.50 m. At this stage, semi-subterranean dwelling structures cut into the natural soil were identified in excavation areas A, B, and E (Bakhshaliyev & Bakhshaliyev, 2023, pp. 10-11). Radiocarbon analyses of charcoal samples recovered from hearths associated with these structures produced dates of 5209-4930 BCE, 5038-4799 BCE, 4959-4725 BCE, and 4941-4722 BCE (Bakhshaliyev & Bakhshaliyev, 2023, pp. 10-12). These results indicate that the settlement complex was constructed during the final quarter of the sixth millennium BCE and remained in use into the beginning of the fifth millennium BCE (Bakhshaliyev & Bakhshaliyev, 2023, p. 12).

The ceramic assemblage recovered from this level was produced primarily from chaff-tempered clay and fired in various shades of red. Some examples were covered with red or cream-coloured slips (Bakhshaliyev & Bakhshaliyev, 2023, p. 17). The pottery can be divided into four principal categories: impressed, painted, red-slipped, and plain wares. Since painted examples occur only in limited quantities, impressed pottery constitutes the dominant component of the assemblage (Bakhshaliyev, 2020, pp. 20-21). The impressed decoration was produced by applying fingers, fingernails, and various tools to vessel surfaces. The discovery of numerous impressed pottery fragments within and around the rectangular pottery kilns identified in Area E at Nakhchivan Tepe indicates local production of these vessels (Bakhshaliyev & Bakhshaliyev, 2023, pp. 13, 15).



Within the Late Neolithic level of Nakhchivan Tepe, part of the impressed decoration was applied to burnished vessel surfaces with a blunt tool, as observed in the Karabakh assemblages, whereas other examples were executed on matte surfaces in accordance with the Dalma tradition (Bakhshaliyev, 2020, p. 20). This sharing of technological choices may be regarded as an archaeological manifestation of technological transmission.

From both typological and technological perspectives, this level shows similarities with the Neolithic settlements of the Karabakh-Mil Plain, including Ilanlitepe, Ismayilbeytepe, and Chalagantepe (Narimanov, 1987, pp. 48-50; Akhundov, 2017, pp. 17-904; Almammadov, 2018, pp. 152-154). Whereas impressed decoration in the earlier Karabakh assemblages tends to be smaller in scale, denser, and occasionally more irregular in execution, the same technique in the Late Neolithic level of Nakhchivan Tepe appears more standardized and closer in character to the Dalma tradition. This gradual differentiation is consistent with a process of local development rather than direct copying. Radiocarbon dates obtained from the Karabakh sites (Ismayilbeytepe: 5730-5450 BCE; Goytepe: 5617-5391 BCE) indicate that the impressed pottery tradition existed in the South Caucasus prior to the emergence of the early Dalma Tepe Culture in the Urmia Basin. Such a pattern is consistent with the transmission of technological knowledge and cultural traditions between the Urmia Basin and the Karabakh-Nakhchivan axis. The chain of settlements extending from Nakhchivan to the Salmas Plain and further south, together with the shared use of Gegham and Zangezur obsidian in all three regions, supports this direction of interaction and the existence of an interregional network (Bakhshaliyev & Bakhshaliyev, 2023, pp. 7-8, 12-13, 21-22).

The transition to painted pottery in Nakhchivan has been associated with Halaf and Ubaid influence. Direct evidence exists in support of this proposal. Halaf-type painted finds from the Neolithic levels of Kultepe I, together with plain and painted pottery of Halaf-Ubaid character from Nakhchivan Tepe and Bulovqaya (Bakhshaliyev & Bakhshaliyev, 2023, pp. 18-20), indicate that the increase in the use of painted pottery corresponds to the Early Chalcolithic period and the first half of the fifth millennium BCE. This development is connected with intensified interaction between Nakhchivan and the Urmia Basin.

The painted pottery phase may be evaluated, in accordance with the model proposed by Pereira and colleagues, as a material expression of broader social networks and cultural information exchange (Pereira et al., 2023, pp. 1, 3). By contrast, the impressed pottery observed in the earlier levels of Nakhchivan Tepe may be interpreted as a decorative system reflecting the continuity of local and regional traditions. The stratigraphy of Nakhchivan Tepe therefore provides a rare archaeological context in which different ceramic traditions and the social identities associated with them can be traced in sequence.



## Discussion

The present study is not based on the production of new archaeometric analyses, but rather on the synthesis and reassessment of existing stratigraphic, chronological, petrographic, and theoretical data. The combined evaluation of the stratigraphic, chronological, archaeometric, and theoretical evidence presented here indicates that the origin and distribution of Dalma-type impressed pottery cannot be fully explained within the framework of the long-accepted single-centre model. Although the Urmia Basin has traditionally been regarded as the principal centre in the formation of the Dalma Tepe Culture (Abedi et al., 2015, pp. 321-322; Henrickson & Vitali, 1987, p. 37), evidence obtained in recent years from the sites of Nakhchivan and Karabakh requires a reassessment of this interpretation (Bakhshaliyev, 2020, p. 46; Bakhshaliyev, 2023, pp. 194-195).

The stratigraphy of Nakhchivan Tepe and the radiocarbon dates obtained from the Karabakh-Mil Plain indicate that the impressed pottery tradition has early roots in the South Caucasus. These data call for a reconsideration of the classical Urmia-centred model and support a developmental scenario based on interactions between Karabakh, Nakhchivan, and the Urmia Basin (Bakhshaliyev, 2020, pp. 20-21; Bakhshaliyev & Bakhshaliyev, 2023, pp. 17-18; Almammadov, 2018; Bakhshaliyev & Bakhshaliyev, 2023).

Petrographic and archaeometric investigations likewise support this interpretation. Analyses conducted at Surezha, Seh Gabi, Godin Tepe, and other settlements demonstrate that Dalma-type pottery was produced from local raw materials in different regions, while exhibiting a high degree of similarity in decorative and technological characteristics (Stein & Fisher, 2020, pp. 144-145; Hossein Mardi, 2025, p. 14; Rahimi Sorkhani & Eslami, 2018, pp. 220-232). This apparent paradox, namely the coexistence of local production and regional stylistic homogeneity, suggests that what circulated was not the pottery itself, but rather the technological knowledge and decorative conventions associated with its production. Such an interpretation is consistent with the principal propositions of communities-of-practice and cultural transmission theories (Lave & Wenger, 1991, pp. 29-42; Wenger, 1998, pp. 72-84; Roddick & Stahl, 2016, pp. 3-5).

From a theoretical perspective, it is difficult to regard impressed pottery as having been produced solely for aesthetic purposes. The persistence of standardized motifs across a wide geographical area raises the possibility that these carried particular social functions. The available evidence is most consistent with a model of interconnected communities extending across Karabakh, Nakhchivan, and the Urmia Basin (Wobst, 1977, pp. 18-21; Sackett, 1986, pp. 268-270). At the same time, the existing data do not directly demonstrate that impressed motifs possessed specific religious, cosmological, or protective meanings. Interpretations relating to protection or fertility should therefore be approached with caution and considered subjects for future investigation.



Taken together, the stratigraphic, chronological, and archaeometric evidence presented here supports the existence of interactions among communities occupying Karabakh, Nakhchivan, and the Urmia Basin. Within this framework, impressed pottery may be understood not as a finished product dispersed from a single centre, but as a material phenomenon shaped through shared technological knowledge, mechanisms of social learning, and regional interaction. Theoretical approaches in archaeology likewise provide support for such an interpretation (Collar et al., 2015, pp. 2-4; Peeples, 2019, pp. 453-456; Brughmans & Peeples, 2023, pp. 28-35; Pereira et al., 2023, pp. 1-3).

The results further indicate that Dalma-type impressed pottery represents not merely a decorative tradition, but also a material expression of regional social interaction, the transmission of technological knowledge, and processes of collective identity formation. The evidence from Nakhchivan Tepe and Karabakh provides important archaeological data for tracing the early stages of these processes and suggests that the emergence of the Dalma Tepe Culture is more convincingly explained within a framework of multi-centred development.

## Conclusion

The present study indicates that existing interpretations concerning the emergence and distribution of Dalma-type impressed pottery require reassessment. The stratigraphic sequence at Nakhchivan Tepe and the radiocarbon dates obtained from sites in the Karabakh-Mil Plain indicate that the impressed pottery tradition was present in the South Caucasus since the Neolithic period. These data support the view that Karabakh and Nakhchivan played an important role in the process through which the Dalma cultural tradition developed.

The results of petrographic and archaeometric investigations conducted in different regions demonstrate that Dalma-type pottery was predominantly produced from local raw materials, while at the same time exhibiting a high degree of technological and decorative similarity. This pattern suggests that the distribution of the pottery tradition was associated not with the circulation of finished products, but rather with the transmission of technological knowledge, production practices, and social connections.

Although the available evidence does not permit the identification of a specific religious or cosmological meaning behind the impressed motifs, it does provide grounds for interpreting them as socially meaningful stylistic choices and expressions of a shared cultural tradition. In this sense, impressed pottery can be viewed not only as an element of material culture but also as an indicator of interregional interaction and collective identity.

The results further indicate that the development of the Dalma cultural tradition can be more productively examined within the context of interactions between Karabakh, Nakhchivan, and the



Urmia Basin. Accordingly, the available evidence suggests that Dalma-type impressed pottery is more appropriately understood not as a phenomenon that spread from a single centre, but as the product of a system of interactions that developed between Karabakh, Nakhchivan, and the Urmia Basin.

## Literature

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