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Araştırma/Research

Technological Marks on Pot Bases from Chalcolithic Gülpınar

[KALKOLİTİK GÜLPINAR ÇANAK ÇÖMLEKLERİ ÜZERİNDEKİ TEKNOLOJİK İZLER]

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Anahtar Kelimeler

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Keywords

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ÖZET

Bu çalışma kuzey batı Anadolu da Kalkolitik dönem Gülpınar yerleşiminde çanak çömlek kaideleri üzerinde gözlemlenen teknolojik izleri incelemeyi amaçlar. Seramik üretimiyle ilişkilendirilen bu teknolojik izler daha çok seramiklerin şekillenmesi sürecinden kaynaklanan hasır, sepet, yün dokuma, ağaç yaprağı ve parmak izlerini kapsar. Söz konusu negatif izler Gülpınar'da hem Erken Kalkolitik tabaka (Evre II) hem de Orta Kalkolitik tabaka (Evre III) boyunca oldukça yaygındır ve neredeyse tüm seramik kaidelerinde karşımıza çıkar. Bu teknolojik izlerin incelenmesi dolaylı olarak bize Gülpınar'da ne tür hasır dokuma, yün dokuma ve sepet örme teknikleri kullanılmış olabileceği ve bunların üretimi sırasında ne tür ham maddelerin tercih edildiği konularında bilgiler sunar. Seramik kaideleri üzerinde görülen hasır, sepet, yün dokuma veya ağaç yaprağı izleri bunların bir tür ilkel çark olarak kullanılmasından kaynaklandığı anlaşılmaktadır.

ABSTRACT

This essay aims to examine the technological marks observed on the pot bases from the Chalcolithic site of Gülpınar in northwestern Anatolia. These technological marks, which are mainly related to stage of the forming of the pots, represents the negative impressions of mats, baskets, cloth, and tree leaves, as well as finger prints. These negative impressions on pot bases are characteristic of both Early Chalcolithic (phase II) and Middle Chalcolithic period (phase III) at Gülpınar and they appear almost on pot bases recovered from the site during excavations. Examination of these technological marks in the shape of negative impressions on pot bases from Gülpınar help us to obtain information on the techniques used to make the woollen cloth, mats, and baskets and what kind of raw materials were used in their production. The negative impressions of mats, baskets, cloth, or tree leaves on pot bases result from their use as primitive turntables.

Introduction

Technological marks in the form of negative impressions of woven cloth, mats, baskets, leaves, rope, or fingerprints on the bases were characteristic features of the pottery assemblages of phases II and III at the site of Gülpınar. This is probably the first time that such a high number of pot bases with mat, cloth, basket, and leaf impressions has been reported from any archaeological site in the prehistoric Aegean, since most pot bases in one way or another bear the negative impressions related to the production stage (Table 1). Examination of these negative impressions on nearly a thousand pot bases from Gülpınar raises several questions such as what techniques were used to make the woolen cloth, mats, and baskets and what kind of tools were used in the steps of weaving, mat making, and basket making?

The site of Gülpınar, situated on the southwestern corner of the ancient Troad in northwestern Anatolia, has lately been one of those sites that

help us to obtain a better picture of Chalcolithic inhabitants of the region.[1] Two major phases of the Chalcolithic period have been identified at the site: The Early Chalcolithic period (phase II) dating between 5320 BC and 4940 BC and the following the Middle Chalcolithic period (phase III) with dates ranging between 4930 BC and 4450/4300 BC. No cultural break appears to exist between these phases.[2]

Twill plaiting and coiling were the two most common methods adopted at the site for constructing the mats, while simple plaiting was the prevailing method preferred in weaving thread made of wool. What is important for this study is that pieces of woolen cloth, plaited and coiled mats, and leaves were often used as a type of primitive turntable by the potters of the site.[3] There are in general two main approaches to explain the occurrence of negative impressions of woollen cloth, mats, baskets, and vine leaves on pot bases.[4] According to the first approach, potters place freshly-shaped pots on mats or a piece of woollen cloth to dry before they are fired. This method results in shallow impressions of mats or woven cloth on the bases of pots. In the second approach, the negative impressions of mats and baskets or woven cloth result from their use as primitive turntables. That is to say, potters form their vessels either on old rectangular or circular coiled mats or on a piece of old woolen cloth to prevent the wet clay from sticking to the ground during the first steps of forming the vessel. This might have been one way of pot making before the invention of the potter's wheel. In the absence of the potters' wheel in this period, this method, resulting in deep impressions on pot bases, might have enabled potters to shape their vessels more efficiently than the method that did not employ coasters made from old mats, baskets, or woolen cloth.

Cloth Impressions

No actual evidence, such as a piece of woollen cloth, was found during the archaeological excavations at Gülpınar. Thus, our information regarding weaving activities come from indirect evidence such as the negative impressions observed on pot bases. Indeed, negative impressions of woollen cloth could be identified on the bases of three different pots (Figs. 3-4). The plain weaving technique was predominantly preferred in the production of cloth or woven textiles in these three examples. It is a very elementary technique in which single warps and wefts pass over and under each other at a 90-degree angle in a 1/1 interval. This technique is so far represented by only three examples at Gülpınar, all coming from phase II. Such vessels were probably formed on a piece of woven cloth to prevent wet clay from sticking to the ground, unless these woven cloth pieces were used as a form of primitive turn table. The supporting evidence is that the protrusions left on the edges of the pot base after removal of the woollen cloth were smoothed over by pressing on them with fingers. Threads made of wool appear to have been loosely woven in these examples.

Impression	Phase II	Phase III	Total
Woollen Cloth	3 (0,8%)	-	3 (0,3%)
Coiled Mat	-	3 (0,5%)	3 (0,3%)
Twill-Plaited Mat	346 (97,5%)	583 (97,5%)	929 (97,1%)
Basket	4 (1,1%)	8 (1,3%)	12 (1,3%)
Tree Leaf	-	8 (1,3%)	8 (0,8%)
Fingerprint	2 (0,6%)	-	2 (0,2%)
Total	355	602	957

Table 1. Tabulation of the number of impressed pot bases by phases at Gülpınar.

1 Takaoğlu 2006.

2 Takaoğlu and Özdemir 2018: 481.

3 Özdemir 2013: 68.

4 Özdemir 2007; 2013.

Actual archaeological evidence for woollen cloth of wool or linen made by the plain weave technique has been attested in Anatolia at Neolithic sites pre-dating Gülpınar. Actual remains of woollen cloth came to light at sites such as Çatalhöyük, Çayönü, and Ulucak. At Çatalhöyük, the fragmental remains indicate that cloth woven from wool was also used to wrap the corpse in burials placed under the low platforms of shrines and rooms of houses representing Level VI,[5] while traces of woven linen cloth were identified on a bone sickle in the Cell Building Phase at Çayönü.[6] Neolithic Level Vb of Ulucak in western central-western Anatolia also yielded a piece of woven cloth made of wool in a plain weave attached to a figurine,[7] Impressions of plain weaving, mainly of wool, are quite widely attested in several Neolithic Aegean sites, including Sitagroi in northern Greece, Alimnia on Rhodes, Skoteini Cave on Tharrounia, Athens, and Kephala on Keos.[8]

Mat Impressions

Mats are basically two-dimensional or flat items used mainly for covering the floors of houses in prehistoric times. Although plaiting was also used in the production of three-dimensional items like baskets, containers, and bags, it was chiefly used for two-dimensional items such as floor mats, wall hangings, and screens. At Gülpınar, twill plaiting and coiling appear to have been the two methods adopted at the site for constructing the mats. Among these two techniques, the coiling method was casually utilized at the site.

Coiled mats are made by taking a long bundle of grass or straw and coiling it around and around upon itself in a spiral, each new turn of the coil is attached to the preceding one by being sewn on with stitches. Although the coiling method was often used in the production of three-dimensional items such as baskets, containers, bags, and hats, archaeological evidence shows that coiled matting was seldom used at Gülpınar in the production of two-dimensional objects such as coasters. Negative impressions of coiled matting have so far been identified on the base of only three vessels, all representing phase III at Gülpınar (Figs. 5-6). It is also difficult to know whether these examples of coiled mats were once the base of baskets. It is possible that the coiled basketry in the base of baskets might have been re-used as coasters when the sides were damaged. Examination of these three pot bases indicate that the clay was placed on a circular coiled mat so that it could easily be rotated by hand on the ground. This type of base allowed the potter to turn the pot around as the work progressed. A slightly thicker knot in the center of the coiled mat prevents continuous contact with the ground surface, so that it acts like a primitive form of turntable for the manufacture of large bowls and jars.

In the case of Example 4, the circular mat base on which the foundations were laid is of the same diameter as the intended base of the jar. This is clear because the center of the negative impression of coiled matting matches the center of the pot base on which impressions were found. One may argue in this context that the diameter of the circular mat on which the clay was shaped determined the diameter of the intended pot. If the potter had formed the clay on a large circular mat, then the center of the mat would have been further from the center of the pot base. One may also expect that this allowed the potter to carry the newly formed pot on the drying area together with this circular mat base in order to prevent the pot from sticking to the ground while drying before it was fired. However, since each time a given pot was formed the circular mat had to be removed from the base in order to be used for the production of another the freshly formed pots were probably not left on a circular mat to dry before firing.

The use of circular mats as primitive potters' turntables was suggested for pre-Dynastic Egypt.[9] In addition, G.M. Crowfoot (1934), who examined mat-making and basketry traditions in Palestinian villages in the 1930s, also pointed out that a circular coiled mat was ideal

5 Ryder 1965.

6 Erim-Özdoğan 2012: 216, Fig 61.

7 Çilingiroğlu et al. 2012: 149.

8 Adovasio and Illingworth 2003: 254, Pl. 6.19; Sampson 1987: 81-82, 184, Pl. 45; 1993: 352, Pls. 180-82; Immerwahr 1971: 5-6, 23, Pl. 1.6; Carrington-Smith 1977: 115, Pls. 90-91.

9 Lucas 1962; Johnston 1974: 93.

for use as a primitive turntable.[10] She also stated that this was a practice which had roots way back in the past.

Archaeological evidence for coiled matting has been attested at several Anatolian Neolithic sites pre-dating the examples from Gülpınar, including Çatalhöyük and Domuztepe.[11] Pots with negative impressions of coiled matting are also common at several Aegean Neolithic sites contemporary with Gülpınar. Regarding the prehistoric Aegean, Myres was the first to consider the possibility that pots were formed on circular coiled mats of the same size as the intended base.[12] The negative impression of coiled mats observed on the bases of vessels from Saliagos was thought to have resulted from their placement on circular mats to dry before they were fired.[13] Several other Aegean Neolithic sites with evidence for pot bases with negative imprints of coiled matting are Athens, Sitagroi, Skoteini Cave at Tharrounia, and Kephala on Keos.[14]

Besides the coiling method, twill-plaited matting was commonly preferred at phase II and III at Gülpınar (Figs. 7-13). In twill plaiting, single elements pass over each other in a 2/2 interval. Bases with negative impressions of twill plaiting are often characterized by a diagonal pattern made by a shift in the grouping of warp elements as the weft was plaited through. It appears that wheat stalks formed the main material used in twill-plaited mat making at Gülpınar, though reeds that look like *Juncus sp., Scirpus sp.* and *Typha sp.*, were also used, judging by the impressions on pot bases. The wheat stalks or reeds might have been soaked to make them more flexible before the plaiting process.

Examples 22 and 23 (Figs. 10-11), which belonged to four-footed small bowls, demonstrate that bowls were first shaped on a twill-plaited mat before the feet were attached to the base. Another possibility is that the freshly-shaped bowls were placed on a mat to dry before the four feet were attached to the base.

Negative impressions of twill-plaited matting have been reported from various sites in Anatolia either on pot bases, clay balls, mudbricks or fragments of beaten earth from floors during the Neolithic period, including Çayönü, Çatalhöyük, Hacılar, Ulucak, and Aşağı Pınar.[15] Besides Anatolia, early evidence representing the use of mat impressed pot bases in the sixth millennium BC were also reported from Northern Greece and Turkish Thrace at such sites as Aşağı Pınar, Anza, Karanovo, Nea Nikomediea, and Servia.[16]

Several excavated sites from the fifth millennium B.C. in western Anatolia that could temporally be placed in the Middle Chalcolithic period have yielded pot bases with negative impressions of twill-plaited mats. These sites, other than Gülpınar, include Beşik-Sivritepe and Çine-Tepecik.[17] Nearly all the pots bear negative impressions of twill-plaited mats at both Early Chalcolithic 1 period (phase II) and Middle Chalcolithic (phase III) at Gülpınar. However, phase III at Ulucak is one of those rare places in western Anatolia which yields evidence for pot bases with impressions of twill-plaited mats during the early Chalcolithic 1 period.[18] The Early Chalcolithic 1 fill at phase III of Ulucak has four radiocarbon dates ranging from 5670 to 5470 BC.[19] This would indicate that mats made by employing twill-plaiting were known and practiced continuously in western Anatolia from the Early Neolithic period to the end of the Middle Chalcolithic period. Another curious, recently found pottery assemblage which could be ascribed to Early Chalcolithic was recorded during excavations

10 Crowfoot 1934.

11 Mellaart 1967: 198, Pl. 119; Wendrich 2006; 2007: 231; Carter et al. 2003.

12 Myres 1898: 179.

13 Evans and Renfrew 1968: 71, pl. 55.

14 Labrıola 2008: 316; Immerwahr 1971: 5, 6, 23, Pl. 1:6; Adovasio and Illingworth 2003: 253, Pl. 6.14; Sampson 1993: 352, Pl. 178-79, 182-85, 298; Carrington-Smith 1977: 119.

15 Erim-Özdoğan 2012: 83, Fig. 42; Mellaart 1963: Fig. 6; Wendrich 2007: 235; Mellaart 1970: Fig. 189a; Çilingiroğlu and Çilingiroğlu 2007: 3.

16 Özdoğan 2007: Fig. 424; 2013: Fig. 126-127; Mock 1976: Fig. 64; Seebacher 1997: Pl. 96-97; Pyke And Yiouni 1996: 61; Perles 2001: 243, 245, Fig. 11.5; Ridley And Wadle 1979: 193; Carrington-Smith 2000: 240, Pl. 4.21-4.22.

17 Gabriel 2014: Pl. 9; Günel 2014: 87.

18 Çevik 2018: 508, Fig. 52.6.

19 Çevik 2018: 508, Tab. 52.1.

at Ege Gübre near Ulucak in the İzmir region. Several pot bases with negative impressions of twill-plaited mats were identified there.[20]

Pot bases with twill-plaited mats appear to have been very common among fifth millennium BC sites on the Aegean islands as well. Their presence was reported from such locations as Ftelia on Mykonos, the Cave of the Cyclops on Youra, Aghio Gala Lower Cave on Chios, Tigani on Samos, Kalythies on Rhodes, Partheni on Leros, Skoteini Cave on Euboia, Giali on Nisiros, and Saliagos near Antiparos.[21] Sites such as Sitagroi and Servia have also presented evidence regarding the use of twill-plaited mats in the form of negative impressions on pot bases during this period.[22] This similarity is no coincidence when one considers a certain likeness between the pottery assemblages of western Anatolian sites and the Aegean islands. It is now well established that the fifth millennium BC experienced a rise in the level of cultural interactions within the Aegean region, as seen in the movement of marble, metal, and obsidian artifacts, if not pottery and textiles themselves.

Basket Impressions

A basket is defined here in the sense of a three-dimensional container made by weaving together flexible materials, such as twigs, rushes, or thin strips of wood, in order to separate baskets from the two-dimensional mats used to cover floors or serve as partitions in houses. Nearly a dozen pots bases attest to knowledge of basketry at Gülpınar (31-34). These impressions could have belonged to damaged baskets the bases of which were apparently reused as coasters in pot shaping. Examination of available pot base fragments with deep impressions of baskets uncovered during excavations at phases II and III exhibit no sign of high craftsmanship in the basket-making techniques (e.g., Fig. 14). Among nearly a dozen identifiable examples, there is also no evidence for the presence of a special type of pot that was formed in the basket itself, as identified at Giali on Nisiros.[23]

Leaf Impressions

In addition to pot bases with impressions of woven cloth, mats, and baskets, nearly a dozen examples of pot bases with negative impressions of tree leaves have also been identified during the excavations at Gülpınar (35-41), (Fig. 15). It is likely that the potter fashioned the wet clay on a fresh leaf to prevent the wet clay sticking to the ground during the first steps of pot making.[24] The overall appearance, with a prominent median vein in the center and two lateral veins, indicate that these impressions may have belonged to either vine or poplar (*Populus alba*) leaves. The deep impressions on the bases appear to show that the smooth side of the selected leaf was intentionally placed downwards on the ground. Example 43, bearing impressions of a partially overlapping piece of twill-plaited mat and a tree leaf, shows that potters sometimes employed both tree leaves and pieces of old mats to shape the clay into pots or to leave them on some suitable material to dry before firing (Fig. 16).

There is a widespread tradition of potters using leaves during the fashioning of the wet clay on leaves in the Early Bronze Age Aegean. Pot bases with impressions of leaves have been recorded at numerous sites on the Aegean islands dating to the Early Bronze Age, including Chalandriani on Syros, Markiani on Amorgos, Dhaskalio Kavos, Keros, Paros, Naxos, Aghios Sostis on Siphnos, and Dokathismata on Amorgos.[25] Prior to the Early Bronze Age, leaf impressions have also been attested in the Final Neolithic site of Kephala on Keos among the Aegean islands.[26] The discovery of pot bases with negative impressions in phase III at Gülpınar now indicates that this practice had it roots more than a millennium earlier in northwestern Anatolia.

20 Yazıcı 2009: Pl. 16.

21 Sampson 2002: 89, Pl. 17.1; Sampson 2008: 57; Furness 1956: 197, Pl. 21.7; Heidenreich 1935/36: 139, Pl. 35.2–3; Sampson 1987: 30; 90, 185, Fig. 48.A; Mari 1993: 198, Figs 194–5; Sampson 1988: 101, Figs 83–5, 115, 120, 155–6, Fig. 68.B, 261; Evans and Renfrew 1968: 71, Pl. 55.6–11.

22 Adovasio and Illingworth 2003: Pls. 6.15-6.17; Carrington-Smith 2000: Pl. 4.23.

23 Sampson 1988: 115, 120, 155-56.

24 Özdemir (Ayşe) 2015: 34, 35.

25 Renfrew (J.) 2006: 196, Pl. 48; 2007: Fig. 6.30, 10.16/141; Tsountas 1898: 133, 184; Renfrew 2006: 196.

26 Carrington-Smith 1977: Pl. 90k.

Rope Impression

A single example of the base of a small jar from phase III preserves a cross-tied rope impression (Fig. 17).

Finger Impressions

Archaeological sites seldom leave us evidence of pots bearing fingerprints in order to gain an insight into gender-based tasks related to pot making activities. Pottery clay has suitable properties for preserving finger imprints, particularly when transforming the wet clay into the intended form. In cases where finger imprints on newly-shaped pots were not smoothed away before the drying and firing stages, one may find instances of finger and palm impressions.. Several pot sherds uncovered in phase II at Gülpınar preserve the fingerprints on the base of the pot. These pieces from Gülpınar have not yet been subjected to epidermal ridge analysis to determine the gender of the producers.[27] Figure 18 illustrates the base fragment of a footed bowl that surprisingly presents the fingerprints of a potter (45).[28]

Discussion of Evidence

The results of the evaluation of pot bases having negative impressions of woven cloth, mats, baskets, tree leaves, and rope from phases II and III at Gülpınar provides insights into one way that organic materials may have been utilized during the technological process related to the forming of pots. The finds from Gülpınar demonstrate that pieces of old woollen cloth, pieces of mats, and parts of damaged baskets could have been used as a form of coaster in the shaping of the clay during pot-making. Visual examination of the impressions shows that different types of raw materials that could be gathered with little effort from the immediate vicinity of the site were used to make the mats at the site. In addition to wheat stalks, *Juncus sp., Scirpus sp.* and *Typha sp.* can still be found today within walking distance of the site. One can, surmise, however, that mat-making could have been a seasonal activity carried out at times when the raw materials were plentiful in the immediate vicinity.

The fact that most pot bases bear negative impressions of mats leads one to consider that mat making could have been among the most common craft activities at the site. Analysis of worked bone assemblage from Gülpınar demonstrates that certain tool types found in both phase II and phase III could be linked to mat making activities. Faint negative impressions of mats identified on the earthen floors inside certain rooms seem to indicate that one way the mats were used at Gülpınar was as a floor covering. The inhabitants may have also covered the raised platforms with clay plastered tops in several rooms belonging to phase III, although no traces of this were recognized due to the poorly-preserved condition of the clay plaster.

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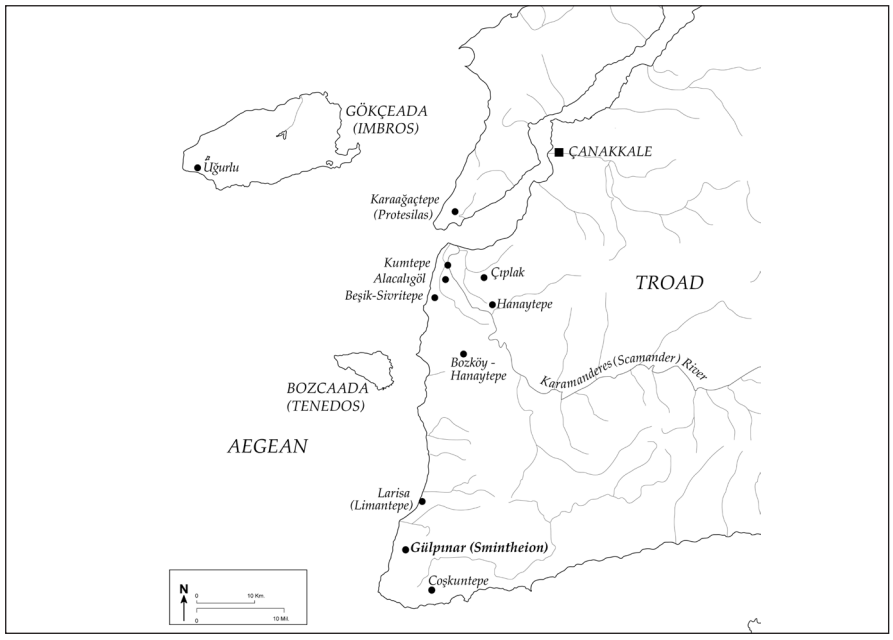


Fig. 1. Map locating Gülpınar and other majör Chalcolithic sites in the Troad (Drawing: Abdulkadir Özdemir)

Fig. 2. A group of pot bases bearing negative impressions of mats and woollen cloths from phases II and III (Photo: Abdulkadir Özdemir)

Fig. 3
Pot bases with negative impressions of woollen cloths of plain weaving technique from phase II (1-3) (Photo: Abdulkadir Özdemir)

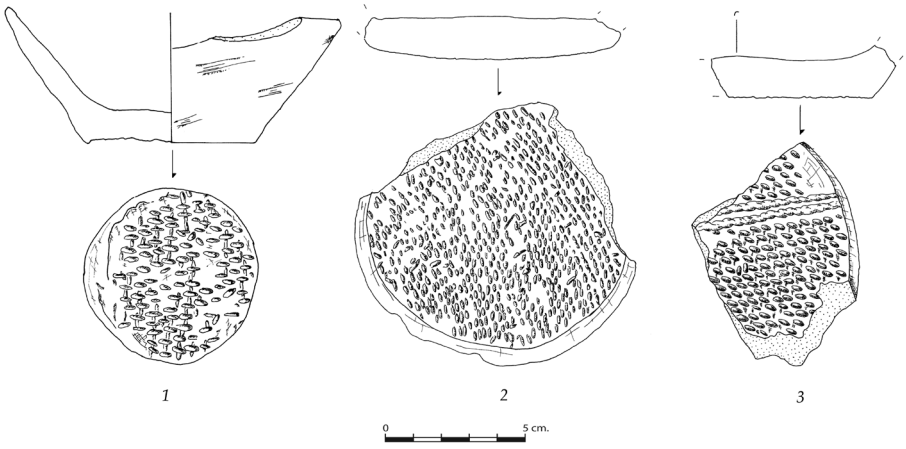


Fig. 4
Pot bases with negative impressions of woolen cloth made in plain weave, phase II (1-3) (Drawing: Ç. Yavşan)

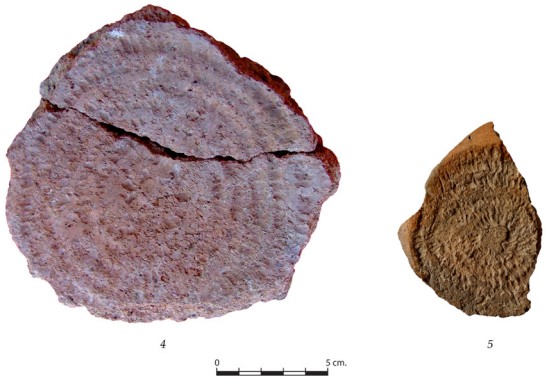


Fig. 5. Pot bases with negative impressions of coiled matting from phase III (4-5) (Photo: Abdulkadir Özdemir)

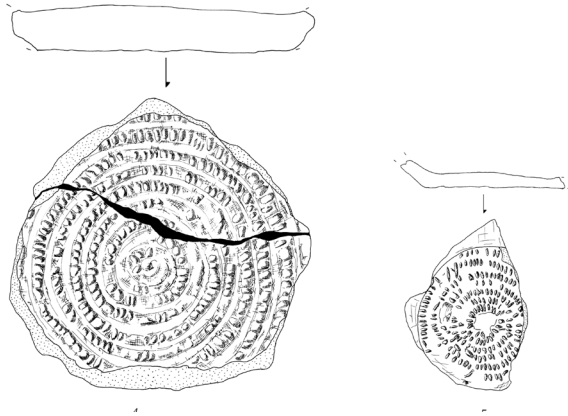


Fig. 6. . Pot bases with negative impressions of coiled matting from phase III (4-5) (Drawing: Ç. Yavşan)

Fig. 7. Pot bases bearing negative impressions of mats made of twill-plaiting tecnique from phase II (6-11) and phase III (12-21) (Photo: Abdulkadir Özdemir)

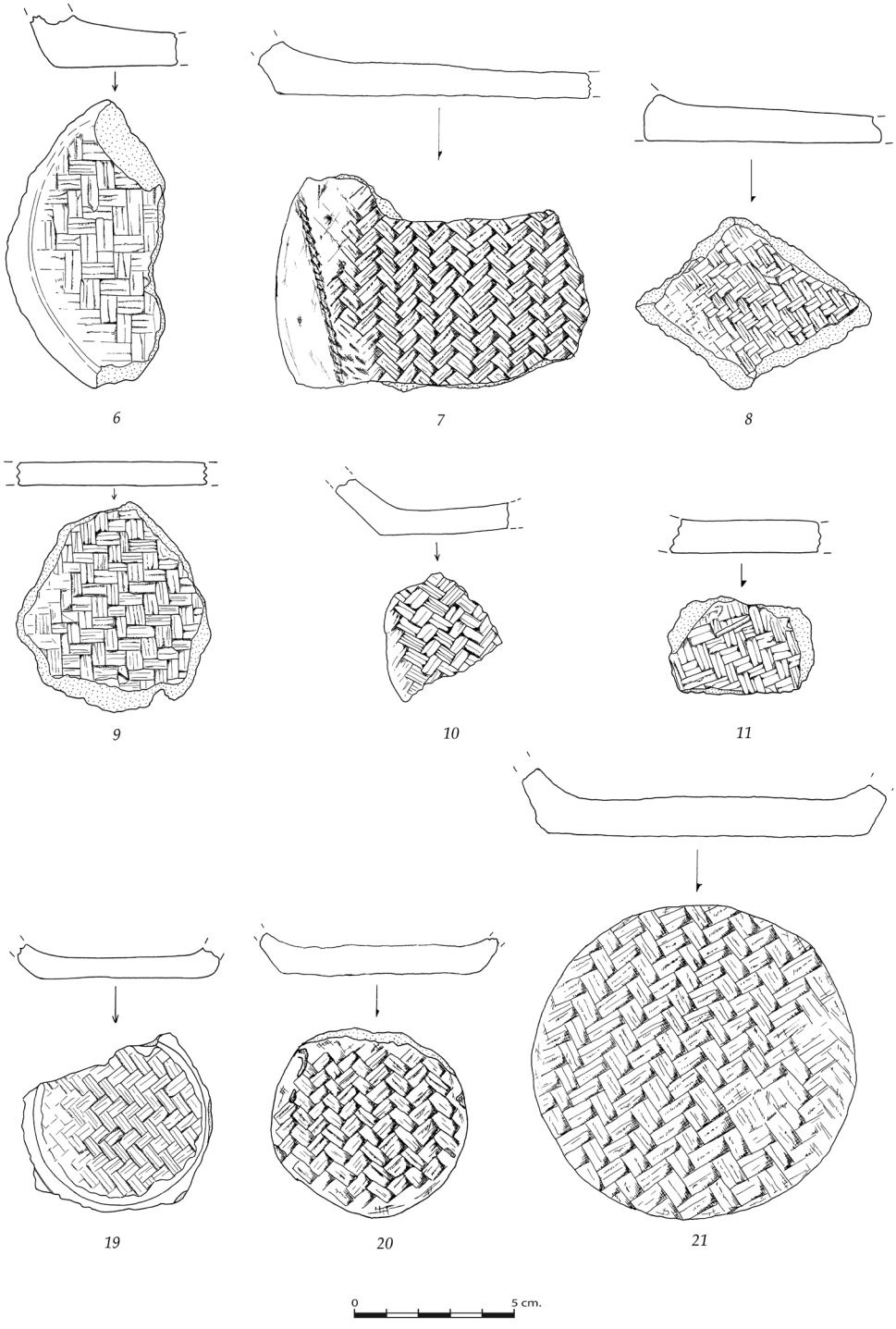


Fig. 8. Pot bases with negative impressions of twill-plaited matting from phase II (6-11) and phase III (12-21) (Drawing: Ç. Yavşan)

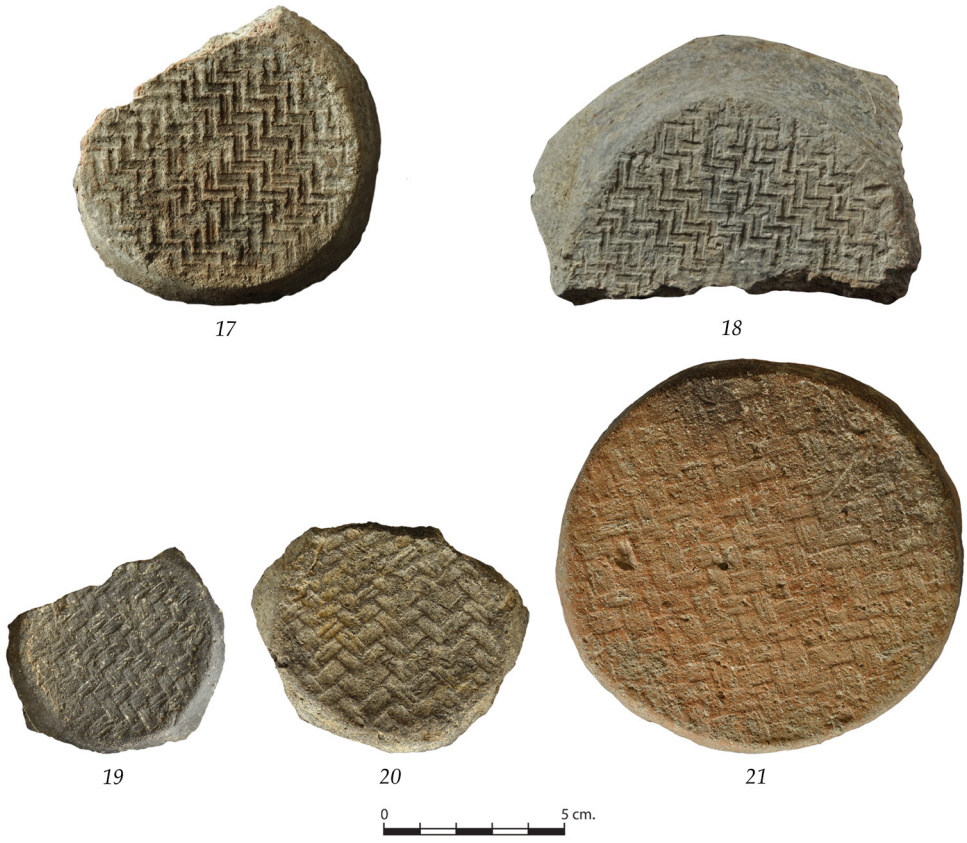


Fig. 9. Pot bases with negative impressions of twill-plaited matting from phase II (6-11) and phase III (12-21) (Photo: Abdulkadir Özdemir)

Fig. 10. Base fragments of four-footed bowls negative impressions of mats made by twill-plaiting technique from phase II (22-23) (Photo: Abdulkadir Özdemir)

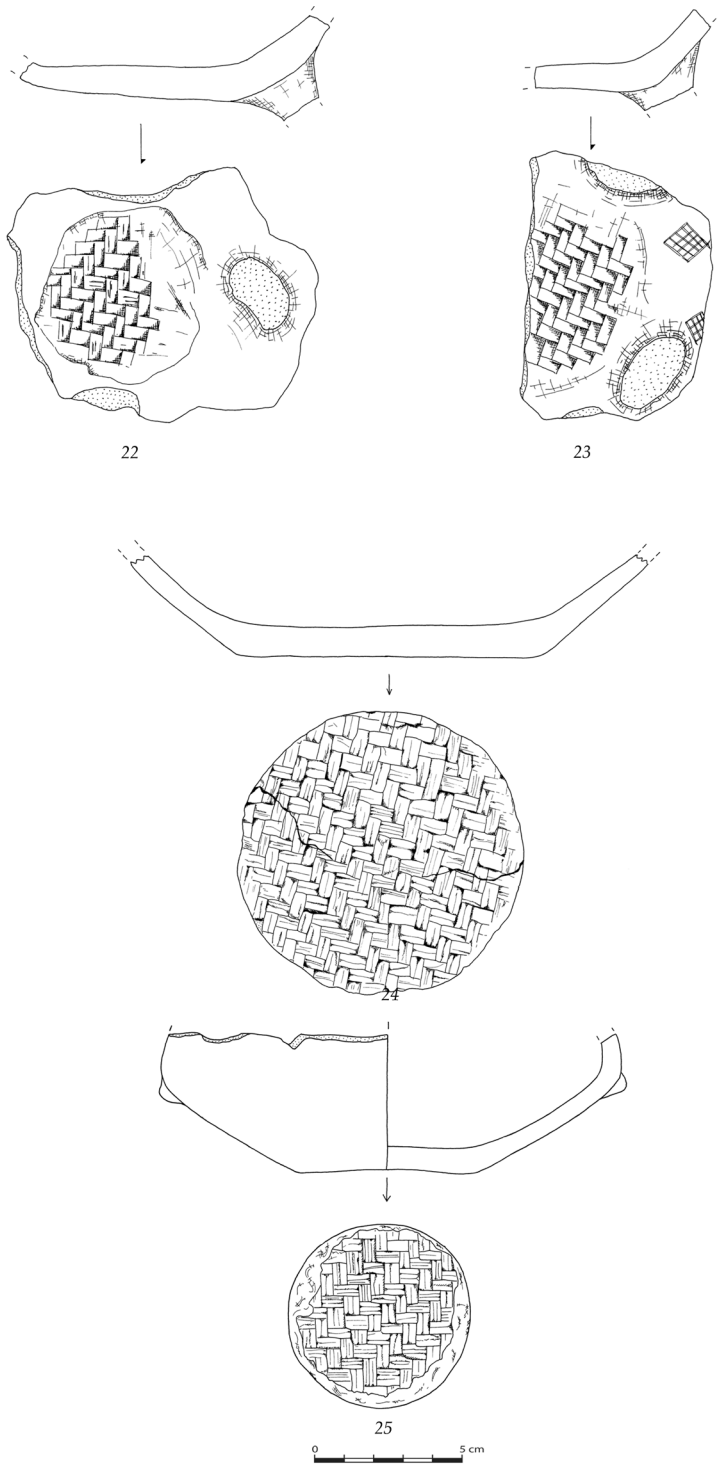
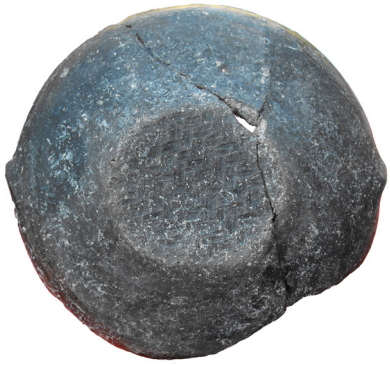


Fig. 11. Base fragments of four-footed bowls from phase II (22-23) and necked-jar bases bearing negative impressions of mats made by twill-plaiting technique from phase III (24-25) (Drawing: Ç. Yavşan)

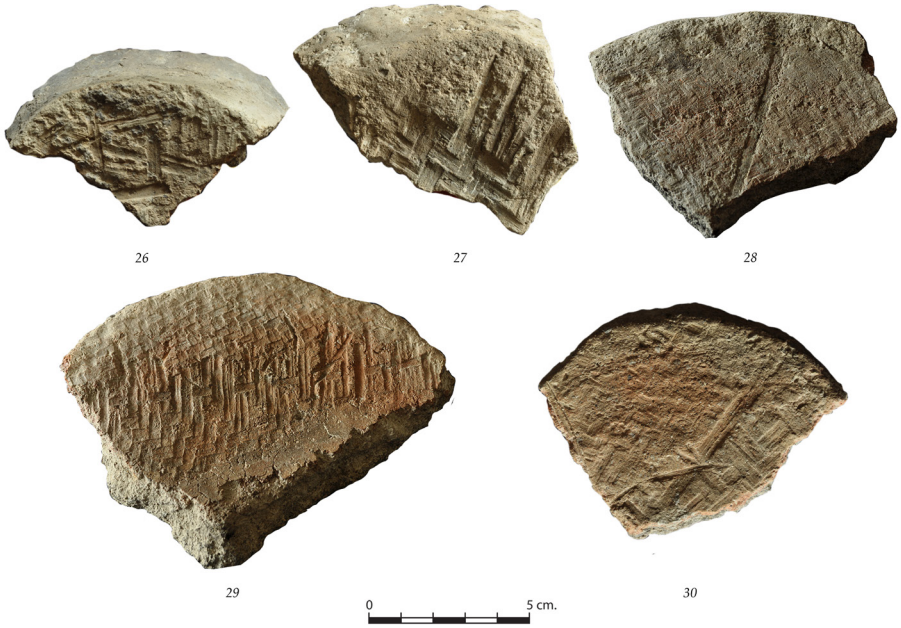
24



25

0 5 cm.

Fig. 12.
Bases of necked-jars with impressions of twill-plaited mats, phase III (24-25) (Photo: Abdulkadir Özdemir)



26 27 28

29 30

0 5 cm.

Fig. 13. Pot bases with negative impressions of twill-plaited matting from phase III (26-30) (Photo: Abdulkadir Özdemir)

Fig. 14. Fragments of pot bases with negative impressions of baskets from phase II (31) and phase III (32-34) (Photo: Abdulkadir Özdemir)

Fig. 15. Fragments of pot bases with negative impressions of tree leaves from phase III (35-42) (Photo: Ayşe Özdemir)

Fig. 16. Base of a jar with impressions of both a tree leaf and a mat, phase III (43) (Photo: Ayşe Özdemir)

Fig. 17. Base of a small jar with cross tied rope impressions, phase III (44) (Photo: Ayşe Özdemir)

Fig. 18. Base of a four-footed bowl with finger impressions, phase III (45) (Photo: Ayşe Özdemir)