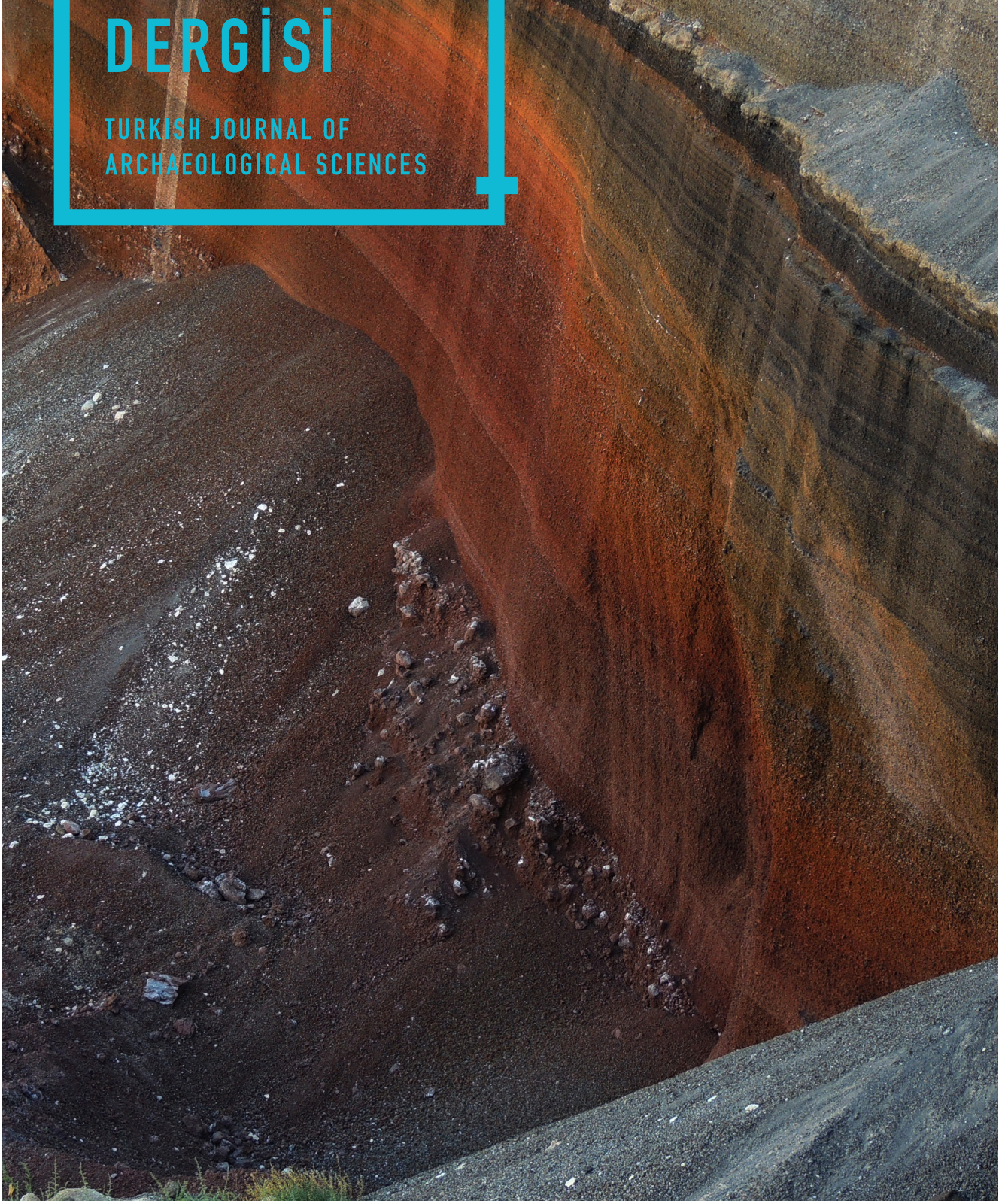


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Editörlerden

Dünyaya açılmamızı sağlayacak Arkeoloji Bilimleri Dergisi'nin ilk sayısı ile hepinize merhaba diyoruz.

Arkeoloji bir süredir geçmişin yorumlanmasında teknoloji ve doğa bilimleri ile yoğun iş birliği içinde yeni bir anlayışa evrilmekte. Üniversiteler, ilgili kurum ve enstitülerde her yeni gün açılmakta olan “Arkeoloji Bilimleri” bölümleri ve programları, geleneksel anlayışı yavaş yavaş terk ederek değişen yeni bilim iklimine adapte olmaya çalışmaktalar. Arkeoloji disiplininin geçmişi, geçmişte yaşayan insanların yaşam biçimlerini bütüncül bir şekilde anlamaya, hızla gelişen ve yaygınlaşan teknolojilerle her geçen on yılda daha fazla yaklaşıyor. Arkeolojik araştırmalar, sorgulama ve değerlendirme biçimleri, bu yeni bilim üretme biçimine dönüşüyor. Derginin editörleri olarak bizler, bu süreçte, bu dönüşüme katkı sağlayacak bir mecra oluşturma'nın önemli olduğu kanısındayız.

Amacımız arkeoloji içindeki arkeobotanik, arkeozooloji, alet ve bina teknolojileri, tarihlendirme, mikromorfoloji, biyoarkeoloji, jeokimyasal ve spektroskopik analizler, coğrafi bilgi sistemleri, iklim ve çevre modellemeleri gibi farklı uzmanlık alanlarının çeşitlenerek yaygınlaşmasına katkı sağlamak ve arkeolojide bilimsel yöntem ve analizlerin geliştirilmesi ve uygulanması üzerine çalışan bilim insanlarını bir araya getirmek. Elbette yeni ve özgün metodolojik ve kuramsal yaklaşımlar üzerine yapılan araştırmalara da yer vereceğiz. Destek, katkı ve ilginizi derginin seyri ve gelişimi adına çok önemli görüyoruz.

Güneş Duru & Mihriban Özbaşaran



Note from the editors

We would like to take this opportunity to introduce ourselves to the world, and say ‘hello’ to the archaeological media with the very first issue of our new archaeological journal: The Turkish Journal of Archaeological Sciences.

For the past couple of decades archaeology has been evolving in close cooperation with new technologies and the advances in the natural sciences towards new understandings and interpretations of the past. More and more newly established departments and programs in universities and other relevant institutions focus on “Archaeological Sciences” as they try to adapt to a changing climate, and gradually abandon older traditions. Rapidly developing technological, methodological and analytical advances move us closer to understanding the way of life in past communities in a holistic way. Archaeological research programs, and the many innovative new ways of testing, inquiring and evaluating these all converge into this new way of producing ‘science’. As the founding editors of the TJAS, we think it is important to have a medium that will contribute to this transformation.

Our goal is to contribute to the diversification and dissemination of different areas of expertise such as archaeobotany, archaeozoology, tool and building technologies, dating methods, micromorphology, bioarchaeology, geochemical and spectroscopic analyses, geographical information systems, climate and environmental modeling. We aim to bring scholars working on the development and application of scientific methods and analyses together in these volumes. We also seek to include in these pages recent advances in methodological and theoretical approaches. Your support, contributions and engagement with the archaeological science presented here are crucial to the progress and development of the journal.

Güneş Duru & Mihriban Özbaşaran

From Beazley to Forensic Labs: Investigating Ancient Fingerprints in Classical Archaeology

Tuna Şare Ağtürk^a, Kimberlee Sue Moran^b

Abstract

This essay is about an experimental methodological study that explores the potential of ancient fingerprint analysis left on terracotta objects in revealing ancient manufacturers' identities and production processes. A general overview of methods used to trace the artisans' 'hands' on ancient clay artifacts from the Beazley-Method to modern forensic approaches to ancient fingerprints is followed by a case study on a group of terracotta figurines discovered from a 4th century BCE tomb at Assos. This case study has revealed traces of fingerprints left on the clay surfaces of the figurines. Formally known as friction ridge detail (FRD), fingerprints left as impressions on the clay became permanent after the firing of the mostly mold-made figurines. After a technical documentation, we studied these fingerprints in order to understand their production and reveal some aspects of the identity of the workers involved in the manufacturing process. The initial goal in this case study was to find an FRD of an individual left on two stylistically different figurines to test the contemporaneous production of different-styled figurines by the same artisan. Unfortunately, although present, most recorded FRD on the figurines were insufficient in detail for comparison to find a "match" on different figurines. However, the areas on the figurines where FRD were found revealed some aspects of the production processes of the artisans. Furthermore, the overall methodological approach we applied to the material has shown the potential of fingerprint analysis as a new research field in Classical archaeology.

Keywords: ancient fingerprints, terracotta figurines, Assos, Classical Archaeology

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Özet

Bu makale, antik dönem zanaatkarlarının kimliklerini ve üretim süreçlerini ortaya çıkarmada ürettikleri pişmiş toprak nesnelerde kalan parmak izlerinin analizini araştıran deneysel bir metodolojik çalışmayı içerir. Antik seramiklerde zanaatkarın ayırt edici el izini tespit etme üzerine kurulu Beazley Method'undan, forensik bilimin etkisinde gelişen antik parmak izi araştırmalarına kadar bu yaklaşımın tarihsel gelişimi değerlendirildikten sonra Assos'ta, MÖ 4. yüzyıldan kalma bir mezarda bulunan bir grup pişmiş toprak figürin üzerinde yaptığımız bir vaka çalışması sunulmuştur. Assos figürinlerinin yapım aşamasında kil yüzeylerinde kalan ve bilimsel literatürde sürtünme sırtı detayı (FRD) olarak adlandırılan parmak izleri, figürinlerin fırınlanmasından sonra kalıcı hale gelmiştir. Figürinlerin üretimlerini anlamak ve üretim sürecine dahil olan işçilerin kimlik özelliklerini ortaya çıkarmak için üzerlerindeki parmak izleri teknik olarak incelenmiş ve belgelenmiştir. Bu vaka çalışmasındaki öncelik amaç, aynı zanaatkar tarafından farklı tarzdaki figürinlerin eşzamanlı üretimini test etmek için stil açısından farklı iki figürin üzerinde bırakılan tek bir kişiye (zanaatkara) ait FRD'leri bulmaktır. Ne yazık ki, mevcut olmasına rağmen, figürinler üzerinde kaydedilen FRD'lerin çoğu, karşılaştırma yapmak ve farklı figürinler üzerinde bir eşleşme bulmak için yetersiz kalmıştır. Ancak, birer alet izi gibi, figürinlerdeki FRD izleri zanaatkarların farklı üretim süreçlerinin bazı yönlerini ortaya koymuştur. Ayrıca, malzemeye uyguladığımız genel metodolojik yaklaşım, Klasik Arkeoloji'de yeni bir araştırma alanı olarak parmak izi analizinin potansiyelini göstermiştir.

Anahtar Kelimeler: antik parmak izi, terrakotta figürinler, Assos, Klasik Arkeoloji

Introduction

When we think of the concept of tracing the hands of artisans on ancient Greek pots, the first person that will come to mind is Sir John Beazley and his method of identifying Attic vase painters which changed the course of scholarship on Classical art and archaeology in the 20th century (Robertson 1991; Oakley 1998; Driscoll 2019). Inspired from Morelli's method for studying Italian Renaissance painting and in the absence of signatures, Beazley distinguished the hands of individual vase painters on stylistic grounds and documented and ordered them for comparison¹. His method, later applied to all types of Greek painted pottery, led to a large archive still used to classify ancient Greek pottery². The Beazley-Method, which is driven by the concept of 'connoisseurship' (to find which artist painted a particular painting and when and how in order to give it a market value) of 20th century art history, has been under attack in recent scholarship (Beard 1991; Whitley 1997). Scholars are now using a variety of

¹ Oakley (1998, 2009) in favor of Beazley, argues that he was not inspired by Morelli as commonly thought but German scholars especially Hartwig, who were already making attributions to signed Greek vases in the 1940s.

² For an extensive online database established with the method Beazley initiated, see Beazley Archive Pottery Database of the University of Oxford <https://www.beazley.ox.ac.uk/pottery/default.html>

new approaches to understand the production and consumption of such clay vases in the ancient world. Semiological methods, for example, are being used to understand the imagery on the vases, and chemistry and petrography come into action to understand clay compositions and thus manufacturing processes and trade links (Marconi 2004; Oakley 2009). A fairly new method, which also involves the tracing of the artisans' hands on clay pots and figurines of the Classical period, is fingerprint analysis. Inspired by forensic science, the study of ancient fingerprints left on clay and stone artifacts has become more and more popular over the last decade.

Historiography and the Scope of Ancient Fingerprint Studies

Prior to the advent of DNA, fingerprints were the only method known to positively identify an individual. Whilst a few rudimentary studies of fingerprints took place prior to the late 19th century, the formal establishment of dactylography (the study of fingerprint patterning) took off with the work of Henry Faulds, Francis Galton and others in the 1880s and 90s (Galton 1892; Henry 1900; Wilton 1938; Cummins and Midlo 1961). Indeed, it was Henry Faulds who first developed an interest in fingerprints through the examination of ancient Japanese pottery (Faulds 1880).

In the early 20th century as fingerprinting became a stalwart of criminal investigation within the new field of forensic science, dactylography began to grow within and parallel to fields such as physical anthropology and medical research (Asen 2018a, 2018b). Unique to the individual, the FRDs of the fingertips and palmar regions were seen as phenotypic clues to genetic questions. At their most benign, fingerprints were used to detect genetic conditions and disorders such as congenital heart disease and Down's Syndrome (Cummins et al. 1950; Alter 1967; Asen 2018b)³. However, fingerprints were also used to reinforce racist ideologies of the time enabling studies that sought to sort populations into racial categories and hierarchies based on fingerprint patterning (Asen 2018a). With the advent of genetic sequencing, often, confusingly referred to as DNA fingerprinting, dactylography was largely abandoned. Though more time-consuming and infinitely more expensive, DNA is much more objective, quantifiable, and easily subjected to statistical analysis.

Within archaeology, FRD on clay was recognized in the first half of the 20th century as a viable form of artifactual data (Wilton 1938; Cummins 1941; Badé 1934; Crawford and Austin 1935). FRD serves as a toolmark, evidence of how clay was shaped, manipulated, and formed. In some instances, FRD appears to be used as a maker's mark or as a measure of authentication, intentionally cast and preserved. However, it is unlikely that the act was in recognition of a fingerprint's uniqueness (Cummins 1941, 394; Polson 1950). Rather, it has been likened

³ Dactylography is seeing a modest renaissance today as a rapid means of genetic diagnosis.

to “making one’s mark” in the form of an “X” on a document for those without a signature (Åström and Eriksson 1980).

More recently, ancient fingerprint (paleodermatoglyphics) studies have focused on gleaned data from the morphology of the FRD in an effort to assign the maker an age and sex (Acree 1999; Králík and Novotný 2003; Bennison-Chapman and Hager 2018; Lambert et al. 2018; Sanders 2015; Kanter et al. 2019; Fowler et al. 2019; Fowler et al. 2020). Friction ridges form a series of parallel lines and the assumption is that the space between ridges, the epidermal ridge breadth, expands as the fingers grow from birth to adulthood (Hecht 1924; Cummins and Midlo 1961; Castex 1994; Kamp et al. 1999; Gillam et al. 2008, Fowler et al. 2020). Broadly speaking, this is true, but robust, large-scale, cross-population research has not been conducted to determine the rate of expansion, whether that rate is constant, at what age expansion ceases, and whether there is any contraction of friction ridges as one ages. It is also not well understood how much human variation is displayed in the distance between ridges. Some studies have measured the distance between ridges on artifacts and found that the measurements clustered into groups (Sjöquist and Åström 1991; Kantner et al. 2019). The groups have been interpreted as displaying different ages of workers but without an understanding of how much variation is within a population, it is a speculative conclusion, especially when distinguishing between adolescents and adults (Fowler et al. 2019; Fowler et al. 2020). Finally, the impact of the clay medium will affect FRD. If clay contracts during drying or firing, the result will make any measuring of ridge spacing unreliable. Shrinkage corrections may be applied to ridge measurements, but accuracy is dependent on a thorough study of the specific medium.⁴

Similar to age, the assignment of sex based on FRD faces many of the same problems. More robust population studies have found an indication of a measurable bimodal difference in ridge density, the number of ridges packed within a square millimeter of a fingerprint, between males and females (Acree 1999; Sanders 2015; Suwarno and Santosa 2017)⁵. However, at most, these studies have examined 400-800 subjects within the same population (Stücker et al. 2001; Gungadin 2007; Nayak et al. 2010; Kaur and Garg 2011; Gnanasivam and Vijayarajan 2019). Issues of human variation within and across populations and the effects of aging have not been systematically studied. While the impacts of clay shrinkage are accounted for in some studies (Králík and Novotný 2003), it is not consistently addressed (Bennison-Chapman and Hager 2018) nor is the issue that the different clay types may produce different shrinkage rates. Age

⁴ Clay composition, moisture levels, and firing temperatures will impact shrinkage. In order to calculate shrinkage rates, an experimental approach is necessary: researchers should acquire clay that is the same as that of the artifacts under investigation and not attempt to use a proxy substrate.

⁵ The size of the square depends on the study. At least one study counted the number of ridges with 5mm² (Sanders 2015); most others have used 25mm² based on Acree (1999).

and sex assignment based on FRD holds promise but more research is needed before the methodologies can be consistently used with a high degree of reliability.

The context of clay artifacts and the quality of the FRD on them are vital for making any sort of interpretation as to the nature of the craft production organization and the identity of the crafters who left their unique marks on clay. A recent study on a group of clay figurines and oil lamps deposited into two Roman cisterns as the waste of a single workshop active around 300 AD at Beit Nattif (Israel) for example, provided scholars a closed context for investigation (Lichtenberger and Moran 2018). Of about 140 areas of FRD recorded on these clay figurines and oil lamps, some were high quality with many minutiae points for comparison. The forensic analysis showed that many of the fingerprints belonged to one single individual producing both oil-lamps and figurines in the same workshop at Beit Nattif. Furthermore, the fingerprint impression consistently left on the lower left quadrant of the spout on oil lamps showed the artisan's individual production technique; he/she held the mold in the left hand and pressed the clay in counterclockwise motion with the right hand in a well-practiced fast method.

The Case of Tomb 4

The so-called Tomb 4 was discovered in 1995 at the Western Necropolis of Assos, a major Classical city in the southern Troad on the Aegean coast of Turkey (Figure 1). The modest Late Classical cist grave for a middle-aged woman and an adolescent girl surprised the excavators with the rich cache of grave goods inside (Şare Ağtürk and Arslan 2015; Figure 2).⁶ Of the 62 well-preserved artifacts, around 50 of them were terracotta figurines of various types including seated female musicians and a dancer, goddesses, comic actors, female mask protomes, and animals. Our detailed analysis of these figurines also revealed basic steps used in their manufacturing: Most of the figurines were cast by applying wet clay to the front and back molds; details were incised with tools; further details were applied after the clay had been removed from the molds; front and back halves were attached to each other with slip; small handmade details/appliques were attached; the figurines were either left open at the bottom or vent holes opened in the back for the firing process in the kiln (Şare Ağtürk and Arslan 2015, 28-31)⁷. On the

⁶ Since the late 19th century, over 300 hundred terracotta figurines of various types have been found in the Western Necropolis at Assos. The typological range of these figurines, including deities, seated and standing females, reclining and standing males, male riders, seated children, busts, protomes, a variety of animals, grotesques, and articulated dolls, indicates the popularity of these burial gifts from the Archaic to the Hellenistic period at Assos. There has never been a scientific research on the provenance of their clay, but the discovery of several molds at Assos indicates that most of these figurines were local products cast from molds using the clay produced from nearby clay beds. For details of the craft of the coroplasts at Assos see Şare Ağtürk and Arslan 2015, 16-23.

⁷ Also see Uhlenbrock 1990, 16 for a general process followed in the manufacturing of terracotta figurines.

basis of a plastic lekythos and a comic actor figurine, both imported from Athens, the burial is dated to the first half of the 4th century BCE. The discovery of these Attic imports with three Archaic-style terracotta mask protomes of the 6th century in the same tomb was puzzling. Their co-existence is explained possibly either as the continued use of archaic-styled protomes in the 4th century BCE, or as due to the fact that archaic-styled protomes were in the possession of the same family for over two generations when women were buried (Şare Ağtürk and Arslan 2015, 23-38).

During the close examination of the figurines several areas of FRD were observed. Through a later forensic analysis of the observed FRD, we initially hoped to find a matching fingerprint on two of the stylistically different figurines from the same tomb to show the co-existence and production of both styles by the same workshop. This would have challenged the traditional art historical method of dating a burial on the bases of the style of its goods. If tracing age or sex through fingerprints were reliable, finding the fingerprint of a ‘female’ manufacturer for mostly female figurines dedicated in the tomb of two females, would of course also be revolutionary.

Methodology

In a three-day operation at the Troia Museum in Çanakkale in August 2020, we recorded traces of 25 fingerprints on 20 of the terracotta figurines found in the Tomb 4. A magnifying glass and a raking light system to reveal the texture of the surfaces helped during the analysis. Areas of FRD or suspected FRD were photographed under normal lighting conditions using a macro photography camera. A cm scale was included in each image and the location on the figurine of each area of FRD was noted. In total, 149 images were analyzed.

The goal of the analysis was to determine whether any of the areas of FRD could be determined as coming from the same source, i.e., a “match”. To do so, an assessment of “value” for comparison was conducted of each area of FRD following standard forensic guidelines (SWGFAST 2013, OSAC FRS 2020). Value/no value determinations are based on the clarity of the mark(s), visible characteristics (such as ridge endings and bifurcations), and the number of visible characteristics and/or minutiae available for comparison. While fingerprint examiners follow a quantitative–qualitative threshold model when establishing a threshold for the minimum number of minutiae required for a comparison, a mark with less than four distinguishable minutiae would be considered to have insufficient detail for a comparison (VanderKolk 2011).

Once FRD was determined to be of “value”, minutiae were annotated digitally (OSAC FRS 2020). Since the assemblage of FRD images was rather small, images containing discernable minutiae could be compared manually side-by-side on a computer screen. Minutiae type, location, and spatial relationship with other minutiae was compared to determine whether they were in agreement between two objects.

Results

Of the 149 images, 137 images were of “no value”. 12 images, representing five distinct areas of FRD were rated as having value, though none had more than six visible minutiae. Among the “no value” images, 20 were of marks that were not FRD. These marks were created by an instrument or fingertip being dragged across the clay to smooth it, leaving a series of parallel striations.

All of the images contained small patches of friction ridge details, many no more than 1cm² in size. However, none of the images contained high level details of a full fingerprint pattern. Of the five areas of FRD rated as having value, one was composed of a large area of palmar impressions. The other four areas were made using the tip of a finger. Comparison of the five areas of FRD resulted in source exclusions, meaning that none of marks “matched” each other.

Discussion

While none of the marks could be matched, their location and presence as a tool mark provided useful information regarding the manufacture of the figurines. Traceable fingerprints were usually on small appliques and bases or at the backs of the figurines which were not meant to be seen up close. Besides fingers, a stick-like object was also used to shape/flatten the surfaces. Disk-shaped appliques on the bench of the three seated grotesque figures or on the chair of a seated female musician for examples were definitely made in hand and pressed with a fingertip into their position (Figure 3 and Figure 4). The marks on the seat of a warrior show that the seat was also made independent of a mold and the artisan used his/her palm to shape it (Figure 5). The marks on the hems of the dress of an oklasma-dancer were generated by a finger trying to smooth a surface in a horizontal and vertical fashion, after the clay figurine was taken out of its front mold (Figure 6). Imprints of two fingertips on the backside of the crown of an archaic protome show where the artisan pressed the clay into the mold (Figure 7).

Conclusion

Unfortunately, the quality of the fingerprints on the terracotta figurines of the Tomb 4 at Assos, were not high enough to find a match, and their quantity (only 25 fingerprints in total) was not enough to produce any sort of statistically significant conclusions regarding age/sex. Yet, the overall study showed that a wider documentation of FRD data on terracotta figurines or pots (which serve as tool marks in the manufacturing process) in the future has a potential in revealing the production processes, workshop organizations, and trade relations in the Classical World. Further research on a much larger data is needed for the identification of the age (through analysis of ridge breadth) and the sex (through analysis of ridge density) of FRDs,

but once a reliable methodology is established, such a research could open new doors for the investigation of the social aspects of labor in the Classical World. In this respect, recording the details of FRD on ancient clay figurines and pots discovered from different cities of the Mediterranean world and establishing a computerized system with a data of electronical images (based on the basic principles of automated fingerprint identification systems used by governmental institutions for various purposes all around the world) could provide new research opportunities within Classical Archaeology.

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Figure 1. Aerial View of the Western Necropolis of Assos with Tomb 4 marked with a red star.



Figure 2. A selected group of terracotta figurines from Tomb 4.

(All images © Assos Excavation and Troia Museum)



Figure 3. Three grotesque figurines (eating or offering bread) seated on a bench, fingertip imprint on the disk applique at the left corner of the bench (Cat. no. 8104).



Figure 4. Seated musician, fingertip imprint on the disk applique at the left corner of her stool (Cat. No. 8145).



Figure 5.
Seated warrior, detail of the base he is seated on with marks of a palm (Cat. no. 8123).



Figure 6.
Oklasma dancer with imprints of a finger used to smooth the clay surface of the hem (Cat. no. 8093).



Figure 7. Archaic protome, with fingertip imprints on the backside of the crown (Cat. no. 8141).



Amaç ve Kapsam

Arkeoloji bir süredir geçmişin yorumlanmasında teknoloji ve doğa bilimleri, mühendislik ve bilgisayar teknolojileri ile yoğun iş birliği içinde yeni bir anlayışa evrilmektedir. Üniversiteler, ilgili kurum ya da enstitülerde yeni açılmakta olan “Arkeoloji Bilimleri” bölümleri ve programları, geleneksel anlayışı terk ederek değişen yeni bilim iklimine adapte olmaya çalışmaktadır. Bilimsel analizlerden elde edilen sonuçların arkeolojik bağlam ile birlikte ele alınması, arkeolojik materyallerin, yerleşmelerin ve çevrenin yorumlanmasında yeni bakış açıları doğurmaktadır.

Türkiye’de de doğa bilimleri ile iş birliği içindeki çalışmaların olduğu kazı ve araştırma projelerinin sayısı her geçen gün artmakta, yeni uzmanlar yetişmektedir. Bu nedenle Arkeoloji Bilimleri Dergisi, Türkiye’de arkeolojinin bu yeni ivmenin bir parçası olmasına ve arkeoloji içindeki arkeobotanik, arkeozooloji, alet teknolojileri, tarihlendirme, mikromorfoloji, biyoarkeoloji, jeokimyasal ve spektroskopik analizler, Coğrafi Bilgi Sistemleri, iklim ve çevre modellemeleri gibi uzmanlık alanlarının çeşitlenerek yaygınlaşmasına katkı sağlamayı amaçlamaktadır. Derginin ana çizgisi arkeolojik yorumlamaya katkı sağlayan yeni anlayışlara, disiplinlerarası yaklaşımlara, yeni metot ve kuram önerilerine, analiz sonuçlarına öncelik vermek olarak planlanmıştır.

Arkeoloji Bilimleri Dergisi uluslararası hakemli bir dergidir. Dergi, Ege Yayınları tarafından çevrimiçi olarak yayınlanmaktadır. Kazı raporlarına, tasnif ve tanıma dayalı çalışmalara, buluntu katalogları ve özgün olmayan derleme yazılarına öncelik verilmeyecektir.



Aims and Scope

Archaeology is being transformed by the integration of innovative methodologies and scientific analyses into archaeological research. With the establishment of new departments, institutes, and programs focusing on “Archaeological Sciences”, archaeology has moved beyond the traditional approaches of the discipline. When placed within their archaeological context, studies can provide novel insights and new interpretive perspectives to the study of archaeological materials, settlements and landscapes.

In Turkey, the number of interdisciplinary excavation and research projects incorporating scientific techniques is on the rise. A growing number of researchers are being trained in a broad range of scientific fields including but not limited to archaeobotany, archaeozoology, tool technologies, dating methods, micromorphology, bioarchaeology, geochemical and spectroscopic analysis, Geographical Information Systems, and climate and environmental modeling. The Turkish Journal of Archaeological Sciences aims to situate Turkish archaeology within this new paradigm and to diversify and disseminate scientific research in archaeology. New methods, analytical techniques and interdisciplinary initiatives that contribute to archaeological interpretations and theoretical perspectives fall within the scope of the journal. The Turkish Journal of Archaeological Sciences is an international peer-reviewed journal. The journal is published online by Ege Yayınları in Turkey. Excavation reports and manuscripts focusing on the description, classification, and cataloging of finds do not fall within the scope of the journal.



Makale Gönderimi ve Yazım Kılavuzu

** Please see below for English*

Makale Kabul Kriterleri

Makalelerin konu aldığı çalışmalar, Arkeoloji Bilimleri Dergisi'nin amaçları ve kapsamı ile uyumlu olmalıdır (bkz.: Amaç ve Kapsam).

Makaleler Türkçe veya İngilizce olarak yazılmalıdır. Makalelerin yayın diline çevirisi yazar(lar)ın sorumluluğundadır. Eğer yazar(lar) makale dilinde akıcı değilse, metin gönderilmeden önce anadili Türkçe ya da İngilizce olan kişilerce kontrol edilmelidir.

Her makaleye 200 kelimeyi aşmayacak uzunlukta Türkçe ve İngilizce yazılmış özet ve beş anahtar kelime eklenmelidir. Özete referans eklenmemelidir.

Yazarın Türkçesi veya İngilizcesi akıcı değilse, özet ve anahtar kelimelerin Türkçe veya İngilizce çevirisi editör kurulu tarafından üstlenilebilir.

Metin, figürler ve diğer dosyalar wetransfer veya e-posta yoluyla **archaeologicalsciences@gmail.com** adresine gönderilmelidir.

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Lütfen makalenizin aşağıdaki bilgileri içerdiğinden emin olun:

- Yazarlar (yazarların adı-soyadı ve iletişim bilgileri buradaki sırayla makale başlığının hemen altında paylaşılmalıdır)
- Çalışılan kurum (varsa)
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Makalenin içermesi gerekenler:

- Başlık
- Özet (Türkçe ve İngilizce)
- Anahtar kelimeler
- Metin
- Kaynakça
- Figürler
- Tablolar

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- Gönderilen yazılar başka bir yerde yayınlanmamış veya yayınlanmak üzere farklı bir yere gönderilmemiş olmalıdır.
- Makaleler özgün ve bilimsel standartlara uygun olmalıdır.

- Makalelerde cinsiyetçi, ırkçı veya kültürel ayırım yapmayan, kapsayıcı bir dil kullanmalıdır (“insanoğlu” yerine “insan”; “bilim adamı” yerine “bilim insanı” gibi).

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Metin ve Başlıkların Yazımı

- Times New Roman karakterinde yazılan metin 12 punto büyüklüğünde, iki yana yaslı ve tek satır aralıklı yazılmalıdır. Makale word formatında gönderilmelidir.
- Yabancı ve eski dillerdeki kelimeler *italik* olmalıdır.
- Başlık ve alt başlıklar **bold** yazılmalıdır.
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- Başlık ve alt başlıklarda yalnızca her kelimenin ilk harfi büyük olmalıdır.

Referans Yazımı

Ayrıca bkz.: Metin içi Atıflar ve Kaynakça Yazımı

- Referanslar metin içinde (Yazar yıl, sayfa numarası) şeklinde verilmelidir.
- Referanslar için dipnot ve son not kullanımından kaçınılmalıdır. Bir konuda not düşme amacıyla gerektiği taktirde dipnot tercih edilmelidir.
- Dipnotlar Times New Roman karakterinde, 10 punto büyüklüğünde, iki yana yaslı, tek satır aralıklı yazılmalı ve her sayfa sonuna süreklilik izleyecek şekilde eklenmelidir.

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- Makalenin altına şekiller ve tablolar için bir başlık listesi eklenmelidir. Görsellerde gerektiği takdirde kaynak belirtilmelidir. Her şekil ve tabloya metin içerisinde gönderme yapılmalıdır (Şekil 1 veya Tablo 1).
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- Görseller Photoshop ve benzeri programlar ile müdahale edilmeden olabildiğince ham haliyle gönderilmelidir.
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Tarihlerin ve Sayıların Yazımı

- MÖ ve MS kısaltmalarını harflerin arasına nokta koymadan kullanınız (örn.: M.Ö. yerine MÖ).
- “Bin yıl” ya da “bin yıl” yerine “... binyıl” kullanınız (örn.: MÖ 9. binyıl).
- “Yüzyıl”, “yüz yıl” ya da “yy” yerine “yüzyıl” kullanınız (örn.: MÖ 7. yüzyıl).
- Beş veya daha fazla basamaklı tarihler için sondan sayarak üçlü gruplara ayırmak suretiyle sayı gruplarının arasına nokta koyunuz (örn.: MÖ 10.500)
- Dört veya daha az basamaklı tarihlerde nokta kullanmayınız (örn.: MÖ 8700).
- 0-10 arasındaki sayıları rakamla değil yazıyla yazınız (örn.: “8 kez yenilenmiş taban” yerine “sekiz kez yenilenmiş taban”).

Noktalama ve İşaret Kullanımı

- Ara cümleleri lütfen iki çizgi ile ayırınız (—). Çizgi öncesi ve sonrasında boşluk bırakmayınız.
- Sayfa numaraları, tarih ve yer aralıklarını lütfen tek çizgi (-) ile ayırınız: 1989-2006; İstanbul-Kütahya.

Kısaltmaların Yazımı

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Yaklaşık:	yak.	Circa:	ca.
Bakınız:	bkz.	Kalibre:	kal.
Örneğin:	örn.	ve diğerleri:	vd.

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- Makalede özel bir font kullanıldıysa (Yunanca, Arapça, hiyeroglif vb.) bu font ve orijinal metnin PDF versiyonu da gönderilen dosyalar içerisine eklenmelidir.

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- Aynı yazarın farklı yıllara ait eserlerine yapılan atıflarda yazarın soyadı bir kere kullanılmalı ve eser yılları “,” ile ayrılmalıdır: ‘... (Peterson 2002, 2010).’
- Aynı yazar(lar)ın aynı yıl içerisindeki birden fazla yayınına referans verileceği durumlarda yayın yılının yanına harfler ‘a’, ‘b’, ‘c’ gibi alfabetik olarak koyulmalıdır.
- Tek yazarlı kaynakları, aynı yazar adıyla başlayan çok yazarlı kaynaklardan önce yazınız.
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Tek yazarlı dergi makaleleri, kitap içi bölümler ve kitaplar

Metin içerisinde:

Yazarın soyadı ve yayın yılı (Esin 1995).

Sayfa sayısı bilgisi verilecekse:

Yazarın soyadı ve yayın yılı, sayfa sayısı (Esin 1995, 140).

Dergi makalesi:

Bickle, P. 2020. Thinking Gender Differently: New Approaches to Identity Difference in the Central European Neolithic. *Cambridge Archaeological Journal* 30(2), 201-218. <https://doi.org/10.1017/S0959774319000453>

Kitap içi bölüm:

Esin, U. 1995. Aşıklı Höyük ve Radyo-Aktif Karbon Ölçümleri. A. Erkanal, H. Erkanal, H. Hüryılmaz, A. T. Ökse (Eds.), *İ. Metin Akyurt - Bahattin Devam Anı Kitabı. Eski Yakın Doğu Kültürleri Üzerine İncelemeler*, İstanbul: Arkeoloji ve Sanat Yayınları, 135-146.

Kitap:

Peterson, J. 2002. *Sexual Revolutions: Gender and Labor at the Dawn of Agriculture*. Walnut Creek, CA: AltaMira Press.

İki yazarlı dergi makaleleri, kitap içi bölümler ve kitaplar

Metin içerisinde:

Her iki yazarın soyadı ve yayın yılı (Dinçol ve Kantman 1969, 56).

Dergi makalesi:

Pearson, J., Meskell, L. 2015. Isotopes and Images: Fleshing out Bodies at Çatalhöyük. *Journal of Archaeological Method and Theory* 22, 461-482. <https://doi.org/10.1007/s10816-013-9184-5>

Kitap içi bölüm:

Özkaya, V., San, O. 2007. Körtik Tepe: Bulgular Işığında Kültürel Doku Üzerine İlk Gözlemler. M. Özdoğan, N. Başgelen (Eds.), *Türkiye’de Neolitik Dönem. Yeni Kazılar, Yeni Bulgular*, İstanbul: Arkeoloji ve Sanat Yayınları, 21-36.

Kitap:

Dinçol, A. M., Kantman, S. 1969. *Analitik Arkeoloji, Denemeler*. Anadolu Araştırmaları III, Özel sayı, İstanbul: Edebiyat Fakültesi Basımevi.

Üç ve daha çok yazarlı dergi makaleleri ve kitap içi bölümler

Metin içerisinde:

İlk yazarın soyadı, “vd.” ve yayın yılı (Özbal vd. 2004).

Dergi makalesi:

Özbal, R., Gerritsen, F., Diebold, B., Healey, E., Aydın, N., Loyet, M., Nardulli, F., Reese, D., Ekstrom, H., Sholts, S., Mekel-Bobrov, N., Lahn, B. 2004. Tell Kurdu Excavations 2001. *Anatolica* 30, 37-107.

Kitap içi bölüm:

Pearson, J., Meskell, L., Nakamura, C., Larsen, C. S. 2015. Reconciling the Body: Signifying Flesh, Maturity, and Age at Çatalhöyük. I. Hodder, A. Marciniak (Eds.), *Assembling Çatalhöyük*, Leeds: Maney Publishing, 75-86.

Editörlü kitaplar

Metin içerisinde:

Yazar(lar)ın soyadı ve yayın yılı (Akkermans ve Schwartz 2003).

Akkermans, P. M. M. G., Schwartz, G. M. 2003. (Eds.) *The Archaeology of Syria. From Complex Hunter-Gatherers to Early Urban Societies (c. 16.000-300 BC)*. Cambridge: Cambridge University Press.

Web kaynağı:

Soyad, Ad. Web Sayfasının Başlığı. Web Sitesinin Adı. Yayınlayan kurum (varsa), yayın tarihi. Erişim tarihi. URL.



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The content of the manuscripts should meet the aims and scope of the Turkish Journal of Archaeological Sciences (cf. Aims and Scope).

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Each manuscript should include a Turkish and an English abstract of up to 200 words and five keywords in both Turkish and English. Citations should not be included in the abstract.

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- Please spell out whole numbers from 0 to 10 (e.g., “the floor was renewed eight times” instead of “the floor was renewed 8 times”).

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- Please prefer an en dash (-) between page numbers, years, and places: 1989-2006; İstanbul-Kütahya.

Abbreviations

- Commonly used abbreviations:

Approximately:	approx.	Figure:	Fig.
Confer:	cf.	<i>Id est:</i>	i.e.,
Circa:	ca.	<i>Exempli gratia:</i>	e.g.,
Calibrated:	cal.		

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- Citations in the text may be made directly, e.g., ‘as shown by Esin (1995) ...’ or in parenthesis, e.g., ‘research suggests ... (Esin 1995)’.
- References within the same parenthesis should be arranged chronologically and separated with a “;”, e.g., ‘... (Dinçol and Kantman 1969; Esin 1995; Özbal et al. 2004).’
- In references to the studies by the same author from different years, please use the last name of the author once, followed by the years of the cited studies, each separated by a “,”, e.g., ‘... (Peterson 2002, 2010).
- More than one reference from the same author(s) in the same year must be identified by the letters ‘a’, ‘b’, ‘c’ placed after the year of publication.
- When dealing with multiple papers from the same author, single authored ones should be written before the studies with multiple authors.
- When dealing with papers where the first author is the same, followed by different second (or third, and so on) authors, the papers should be listed alphabetically based on the last name of the second author.
- When dealing with multiple single-authored papers of the same author, the papers should be listed chronologically.
- Please provide the doi numbers of journal articles.

Below, you may find examples for in-text citations and references.

Single-authored journal articles, book chapters, and books

In-text:

Last name and publication year (Esin 1995).

If the page number is indicated:

Last name and publication year, page number (Esin 1995, 140).

Journal article:

Bickle, P. 2020. Thinking Gender Differently: New Approaches to Identity Difference in the Central European Neolithic. *Cambridge Archaeological Journal* 30(2), 201-218. <https://doi.org/10.1017/S0959774319000453>

Book chapter:

Esin, U. 1995. Aşıklı Höyük ve Radyo-Aktif Karbon Ölçümleri. A. Erkanal, H. Erkanal, H. Hüryılmaz, A. T. Ökse (Eds.), *İ. Metin Akyurt - Bahattin Devam Anı Kitabı. Eski Yakın Doğu Kültürleri Üzerine İncelemeler*, İstanbul: Arkeoloji ve Sanat Yayınları, 135-146.

Book:

Peterson, J. 2002. Sexual Revolutions: *Gender and Labor at the Dawn of Agriculture*. Walnut Creek, CA: AltaMira Press.

Journal articles, book chapters, and books with two authors

In-text:

Last names of both authors and publication year (Dinçol and Kantman 1969, 56).

Journal article:

Pearson, J., Meskell, L. 2015. Isotopes and Images: Fleshing out Bodies at Çatalhöyük. *Journal of Archaeological Method and Theory* 22, 461-482.
<https://doi.org/10.1007/s10816-013-9184-5>

Book chapter:

Özkaya, V., San, O. 2007. Körtik Tepe: Bulgular Işığında Kültürel Doku Üzerine İlk Gözlemler. M. Özdoğan, N. Başgelen (Ed.), *Türkiye’de Neolitik Dönem. Yeni Kazılar, Yeni Bulgular*, İstanbul: Arkeoloji ve Sanat Yayınları, 21-36.

Book:

Dinçol, A. M., Kantman, S. 1969. *Analitik Arkeoloji, Denemeler*. Anadolu Araştırmaları III, Özel sayı, İstanbul: Edebiyat Fakültesi Basımevi.

Journal articles and book chapters with three or more authors

In-text:

Last name of the first author followed by “et al.” and the publication year (Özbal et al. 2004).

Journal article:

Özbal, R., Gerritsen, F., Diebold, B., Healey, E., Aydın, N., Loyet, M., Nardulli, F., Reese, D., Ekstrom, H., Sholts, S., Mekel-Bobrov, N., Lahn, B. 2004. Tell Kurdu Excavations 2001. *Anatolica* 30, 37-107.

Book chapter:

Pearson, J., Meskell, L., Nakamura, C., Larsen, C. S. 2015. Reconciling the Body: Signifying Flesh, Maturity, and Age at Çatalhöyük. I. Hodder, A. Marciniak (Eds.), *Assembling Çatalhöyük*, Leeds: Maney Publishing, 75-86.

Edited books

In-text:

Last name(s) of the author(s) and publication year (Akkermans and Schwartz 2003).

Akkermans, P. M. M. G., Schwartz, G. M. 2003. (Eds.) *The Archaeology of Syria. From Complex Hunter-Gatherers to Early Urban Societies (c. 16.000-300 BC)*. Cambridge: Cambridge University Press.

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