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Bricks and Roof Tiles of Alanya Castle: Evaluation of Animal Footprints from an Ichnoarchaeological Perspective

MUSTAFA YILDIZLI*

Abstract

The use of bricks and roof tiles was prevalent during the ancient era. Brick production could be established wherever suitable clay was available. However, the production methods and demand for bricks varied regionally. In settlements abundant in stone, brick usage was minimal, while in regions with few stone resources, brick usage was widespread. The architecture of Alanya Castle prominently features the use of bricks, especially in the construction of the corner baths and large cisterns in the Inner Castle. Shops within the Middle Wall, such as the Seljuk Bath, Old Bazar (Arasta) and Old Bazaar (Bedesten), were also partially constructed with bricks. Due to its geographical location, Alanya Castle served as a bustling port city during the Hellenic, Roman, Byzantine (Eastern Roman), Seljuk, and Ottoman periods. There are no written records indicating whether the brick trade took place during these periods. This study aims to determine the formation process of imprints found on the bricks and roof tiles discovered in the excavations of Alanya Castle. It also seeks to interpret which animals these imprints belonged to and to analyze data regarding the local production of bricks. The study will therefore, contribute to ongoing ichnoarchaeological research. Imprints of both human and animal footprints, as well as those created by plants, can be found on bricks and roof tiles. In Alanya Castle, 22 bricks and one

Öz

Antik Çağ'da tuğla ve kiremit kullanımı oldukça yaygındır. Tuğla üretimi, uygun kilin olduğu her yerde yapılabilmektedir. Ancak üretimde bölgesel farklılıklar ve ihtiyaçlarda değişiklik göstermektedir. Taşın çok olduğu yerleşimlerde ve coğrafyada tuğla az kullanılırken taşın az olduğu coğrafyada ise tuğla kullanımı çoktur. Alanya Kalesi mimarisinde de tuğla önemli bir yere sahiptir. Özellikle İçkale'de yer alan köşklü hamam ve büyük sarnıçların yapımında tuğla kullanılmıştır. Orta surlarda yer alan arasta ve bedesten gibi yapıların dükkanları da kısmen tuğla ile inşa edilmiştir. Alanya Kalesi konumu itibarıyla Hellenistik, Roma, Bizans, Selçuklu ve Osmanlı dönemlerinde ticari faaliyetlerin yoğun olduğu bir liman kentidir. Bu dönemlerde tuğla ticaretinin yapılıp yapılmadığına dair yazılı kaynaklarda herhangi bir veri yoktur. Bu çalışmada Alanya Kalesi kazısında bulunan kiremit ve tuğla üzerindeki izlerin oluşum sürecini belirlemek, izlerin hangi hayvanlara ait olduğunu yorumlamak ve üretimin yerelde yapılıp yapılmadığına dair verilerin incelenmesi yapılarak, ikhnoarkeolojik çalışmalara katkı sağlamak amaçlanmıştır. Tuğla ve kiremitler üzerinde insan ve hayvan ayak izlerinin yanı sıra bitkilerin oluşturduğu izlere de rastlamak mümkündür. Alanya Kalesi'nde 22 tuğla ve bir kiremit üzerinde hayvan ayak izi tespit edilmiş ve incelenmiştir. Bu eserler üzerindeki izlerin köpek, yaban keçisi, evcil keçi ve çakala ait olduğu saptanmıştır.

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roof tile with animal footprints were identified and examined. The imprints belong to dogs, wild and domestic goats, and jackals. The most common group of imprints is from canids, particularly dogs. Imprints of wild goats and domestic goats represent another significant group on the castle's bricks. Wild goats still reside in Alanya Castle today. Its steep rocky terrain, along with the presence of shrubs, has provided a suitable environment for these animals. This study aims to shed light on the formation of imprints on bricks and roof tiles found in Alanya Castle. It offers valuable insights into ichnoarchaeological research, while also providing information on the potential local production of bricks during different historical periods.

Keywords: Alanya Castle, tile, brick, Ichno-archaeology, animal footprint

En yoğun grubu köpekgillerin ayak izleri oluşturmaktadır. Yaban keçisi ve evcil keçilerin ayak izleri Alanya Kalesi'ndeki tuğlalar üzerindeki diğer yoğun gruptur. Günümüzde Alanya Kalesi'nde yaban keçisi yaşamaktadır. Kalenin sarp kayalık bir alanda yer alması ve çalılıkların bulunması, bu hayvanın yaşamasına olanak sağlamıştır.

Anahtar Kelimeler: Alanya Kalesi, kiremit, tuğla, İkhnoarkeoloji, hayvan ayak izi

Introduction

Alanya Castle is located within the borders of the district of Alanya in the province of Antalya. The area has been used as a settlement since antiquity, thus its name has constantly changed. In ancient sources, the name of the city was Korakesion (Coracesium)¹; in the Middle Ages, it was known as Kalonoros, Candelor and Scandalore.² After the Seljuk Sultan Alâeddin Keykubad conquered the city in 1221, the city was named Alâiyye and, dedicated to the sultan.³ Since the city was on the border of Pamphylia and Cilicia in ancient times, it was sometimes located within Pamphylia and sometimes within Cilicia.⁴

Archaeology continues to work in collaboration with many branches of science such as history, philology, geology, philosophy, art history, palaeontology, zoology, and botany.⁵ Ichnology has become associated with archaeology and practiced since the 1900s. Although the science of ichnology is gradually developing, its connection with archaeology has not been fully established. Efforts have been made to fill this gap to some extent with studies carried out in recent years.

Ichnology, derived from the Greek words “ἵχνος (*ichnos*) = “trace” and “λόγος (*logos*) = science”. It generally examines fossil traces and remains. However, researchers have not reached an accepted consensus regarding the “trace” that this science tries to define.⁶ Like archaeology, ichnology is a field that requires a multidisciplinary study. Ichnology is related to palaeontology, and studies conducted in this area further support this science.

¹ Strab., XIV.V.3; Arslan 2012, 251.

² Lloyd and Rice 1989, 2; Hellenkemper and Hild 2004, 587-90.

³ Lloyd and Rice 1989, 4.

⁴ Smith 1854, 667-68; Lloyd and Rice 1989, 1; Eravşar 2022, 857.

⁵ Başaran 1998, 1-3.

⁶ Bertling et al. 2006, 265-86; Baucon et al. 2008, 43-72; Baucon 2010, 361-67; Rodriguez-Tovar et al. 2010; Buatois and Mángano 2011; Mángano and Buatois 2012, 121-24; Oğuş 2019, 22-29; Öz 2022, 159.

Human and animal footprints on bricks and tiles were quite common in ancient times. Although these traces are found on bricks and tiles unearthed during excavations, there is almost no published analysis of these materials.⁷ This study aims to contribute to this growing field. Stamps and monograms are also found on bricks and tiles.⁸ Such stamps and monograms can be interpreted as findings that will show the production of bricks and tiles and who made or ordered them⁹. However, traces of humans and animals are randomly formed so their assessment and interpretation can also vary.

Brick production can take place wherever there is suitable clay. Vitruvius, who lived in the first century BC, states that the most suitable time for brick production is in the spring or autumn.¹⁰ Brick and tile production varies according to regional differences and needs. It is known that brick is used less in settlements and landscapes where stone is abundant, while brick is used more in areas where stone is scarce.¹¹ However, this is not valid for every period. Alternately, the use of brick may also be used where stone is used, and public demand may increase. Brick production consists of five stages: preparation of the clay, shaping, drying, baking, and packaging-shipping.¹² Bricks are made by hand with the help of wooden moulds.¹³ After the moulding process is completed, it is spread on a flat area to dry. During this drying process, animals such as cats, dogs, lynxes, deer, birds, foxes, goats, and sheep enter the area. They animals walked on bricks and tiles and left their footprints. People did not aim to eliminate these traces, and the traces have survived to this day. Since bricks and tiles are thick, the drying process before firing may take a long time. Weather conditions also determine the duration of the drying process. Under normal weather conditions, bricks dry in approximately two weeks and become suitable for firing. Dobosi thinks that the area where the bricks and tiles were dried may have been covered with a roof¹⁴. She supports this idea by citing the drying time of the bricks and weather conditions. This view may be the correct approach. Cracks occur in tiles and bricks that are directly exposed to the sun, and the production phase of the work may be interrupted. In addition, a job done manually in the Antiquity was already a long effort and workload. Therefore, it makes sense to do the drying process in a roofed area.

Brick holds a key place in the architecture of Alanya Castle. It was used especially in the construction of the pavilion bath and large cisterns in the Citadel. The shops of structures such as Old Bazaar (Arasta) and Old Bazaar (Bedesten), located in the middle walls, were also partially built with bricks. Although it is difficult to determine the exact period of these bricks, it is thought that the bricks belong to the Byzantine (Eastern Roman), Seljuk, and Ottoman Periods. The bricks from these periods have square and rectangular forms. In this study, animal footprints on bricks found in Alanya Castle are examined.

⁷ For the emergence of technology as a science and knowledge through technological studies, see Oğuş 2019, 22-44.

⁸ For publications in ichnoarchaeology, see Onurkan 1999; Bar-Oz and Tepper 2010, 244-47; Bennet 2012, 7-36; Bes and Vanhecke 2014, 387-88; 2015, 107-66; Dobosi 2016, 117-33; Oğuş 2021, 229-48.

⁹ Impressions found on bricks and tiles can provide information about the place of production, the production process, and the individuals or families involved in production; see Filippi 2007, 2:197-219. Bricks were used in structures such as the Pantheon, Trajan's Forum, and the Colosseum during the Roman period; see Kamm and Graham 2014, 99. For studies related to brick stamps, see Onurkan 1999.

¹⁰ Vitr., *De arch.* II.3.2.

¹¹ Bakırer 1981, 3; Ekizler-Sönmez 2013, 216-17; Eroğlu and Akyol 2017, 143; Oğuş 2019, 47-48.

¹² Eroğlu and Akyol 2017, 142.

¹³ Dobosi 2016, 117.

¹⁴ Dobosi 2016, 117.

Material and Method

In the examinations conducted in the excavation areas and the excavation artifact warehouse at Alanya Castle, 22 bricks with animal footprints, as well as one piece of tile, were found. The majority of these bricks were identified and brought together in the excavation repository. Two bricks were specifically identified among those belonging to the pavilion bath. Initially, a general cleaning of the discovered bricks was performed, and they were left to dry. After they had dried, they were numbered, hand-drawn, measured and photographed. They were then transferred to digital format and drawn using the CorelDRAW program. Further preparations for publication were conducted using the Photoshop program. After the publications were scanned, the dimensions of the footprints seen on the bricks were considered. It was then determined to which animals these prints might belong. The size of the animal footprints is displayed in the table, and the identified animals graphically evaluated (table 1, fig. 1). Initially, research was conducted to identify the area where the bricks and tiles were found, and opinions were expressed regarding the buildings in which these artifacts might have been used.

In this study, the works will be dated, and suggestions made regarding their places of production. The formation processes of the traces on bricks and tiles will be examined from an ichnoarchaeological perspective. This approach will also provide information about the condition of the production area and its environment. However, this information is interpretive and not definitive. To support this information, the animal bones found in the excavation should have been evaluated, and the results reexamined in this context.

Once the formation process of the traces on the bricks and tiles is determined, to which animals the traces belong will be interpreted. This contributes to ichnoarchaeological studies by examining the data to determine whether or not the production was done locally.

Table 1 Preserved dimensions of bricks and tiles as well as the dimensions of animal tracks.

Cat. no.	Artifact Length	Artifact Width	Thickness	Foot Length	Foot Width
1	15 cm	14.1 cm	1.7 cm	7.2 cm	7 cm
2	13 cm	23.4 cm	4.9 cm	a: 7.7 cm b: 6.6 cm	a: 6.6 cm b: 5 cm
3	20 cm	27 cm	7.2 cm	a: 7.5 cm b: 3.1 cm	a: 5.5 cm b: 6.5 cm
4	14 cm	18 cm	7.4 cm	8.2 cm	7 cm
5	11 cm	22 cm	4.8 cm	5.4 cm	4 cm
6	17.9 cm	16.1 cm	4.5 cm	3.1 cm	3.4 cm
7	16.8	28.3 cm	7.7 cm	a: 5.1 cm b: 4.9 cm	a: 4.3 cm b: 4.5 cm
8	23.8 cm	23 cm	4.6 cm	a: 5.9 cm b: 6.3 cm	a: 4.4 cm b: 4.6 cm
9	12 cm	15.7 cm	4.6 cm	5.4 cm	5.6 cm
10	12.2 cm	18 cm	5.1 cm	6.7 cm	4.9 cm
11	13 cm	21.2 cm	4.3 cm	5.6 cm	3.7 cm
12	26 cm	19 cm	7.1 cm	a: 6 cm b: 6.4 cm	a: 4.1 cm b: 4.5 cm

Cat. no.	Artifact Length	Artifact Width	Thickness	Foot Length	Foot Width
13	10.8 cm	22 cm	4.4 cm	a: 4.6 cm b: 3.2 cm c: 2.6 cm d: 3.7 cm	a: 3 cm b: 2.9 cm c: - d: 2.7 cm
14	19 cm	21 cm	4.5 cm	a: 4.1 cm b: 4.8 cm	a: 4.4 cm b: 4 cm
15	10.5 cm	15.5 cm	5 cm	5.4 cm	4.3 cm
16	11.5 cm	13.1 cm	5.1 cm	3.2 cm	4.1 cm
17	31 cm	31.5 cm	7.2 cm	a: 5.7 cm b: 6.1 cm c: 6.4 cm	a: 4 cm b: 5.4 cm c: 4.9 cm
18	31 cm	31.3 cm	7.2 cm	a: 5.7 cm b: 6.4 cm c: 6 cm	a: 3.7 cm b: 4.6 cm c: 5.9 cm
19	31 cm	31.5 cm	7.2 cm	7.5 cm	4 cm
20	31 cm	31 cm	7.2 cm	a: 5 cm b: 4.6 cm	a: 3.8 cm b: 3.5 cm
21	31.2 cm	31 cm	7.2 cm	a: 5.8 cm b: 5.5 cm	a: 3.7 cm b: 4.3 cm
22	31.5 cm	31 cm	7.2 cm	a: 6.5 cm b: 6 cm c: 5.5 cm	a: 4.5 cm b: 3.9 cm c: 4.1 cm
23	31 cm	31 cm	7.2 cm	a: 5.1 cm b: 3.7 cm	a: 4.4 cm b: 2.8 cm

Animal Footprints (figs. 2-7)

In this study, animal footprints visible in 23 examples were examined, and an attempt was made to determine the species of these animals. The clay colors of tiles and bricks from Alanya Castle are light red and reddish yellow tones; they contain stone, chamotte, lime, quartz, mica, and sand. It is difficult to determine which period the tiles and bricks of the castle belong to. Exact dating is challenging since there are no traces of production on the tiles and bricks, and, except for a few, it is not known exactly where the bricks came from, however, dating can be made by comparing the size and structure of the bricks seen in the buildings. However, since brick is a durable material, it can be used in different structures for many years. The fact that most of the bricks were not recovered intact prevents us from knowing their dimensions. It is thought that the production of Alanya Castle tiles and bricks was done by local workshops because tiles and bricks with animal footprints are defective products. Since these products do not have a workshop print or stamp, it is unlikely that they were imported from elsewhere. Therefore, these were produced and used locally. Animal footprints are marks that occur randomly on tiles and bricks. These traces occurred at the stage when they were left to dry. From these materials that have survived, the workshops and masters producing them did not interfere with the randomly formed traces so then fired. The saying, "A Lively Departed Trace Remains,"¹⁵ expresses very well the traces left randomly by humans and animals on tiles and

¹⁵ Okan et al. 2005.

bricks. These traces are important remains that allow us to comment about people and animals that have witnessed history.

Traces of a dog (*Canis familiaris*), a jackal (*Canis aureus*), a wild goat (*Capra aegagrus*), and a domestic goat (*Capra hircus*) were detected on the tiles and bricks evaluated here.

The canid group walks in a way that leaves traces either following each other or moving in a diagonal manner. Wild carnivores follow each other in a walking style.¹⁶ As the speed increases in this walk, the contact of the feet with the ground becomes less and the tracks remain shallow. However, the traces are deep and obvious in the crosswalk.¹⁷ Footprints following each other indicate the animal is walking. Therefore, the succession of animal footprints seen on bricks and tiles shows that they were active.

Cat. no. 1 is a tile fragment and the only tile example among the 23 examples. The wall thickness of this tile is 1.7 cm. The mark seen on the tile belongs to a dog. Since the tile is broken, not all of the paws are visible. However, from the number of nails observed, the dog stepped its left front and hind feet in the same place. The fact that three nails are remarkably close in the same place supports this view. In addition, this trace is important data showing that the dog is in motion.

Cat. nos. 2 and 3 are brick samples, and their wall thicknesses are 4.9 and 7.2 cm, respectively. From their wall thicknesses the production patterns of the two bricks are different. The animal footprints on these bricks belong to dogs, as in cat. no. 1. When the trace seen in cat. no. 2 was examined; it was determined that the dog was in motion. These marks are the marks of the dog's right front and hind legs. Even the animal's nails can be clearly traced on the brick. There are two claw marks in cat. no. 3, the boundaries of one trace are clearly visible, while the other trace can be partially followed due to the broken brick. The fact that the traces in cat. nos. 1, 2, and 3 are deep on the tiles and bricks leads us to two different thoughts. According to the first view, these animals were large in size, which is why the tracks became deep. The second opinion is that these traces may be deep or superficial, depending on the stage at which the tiles and bricks are left to dry. In addition, the paw depths of dogs are equal. The front feet are longer than their width and have an oval appearance, while; the rear footprints are narrower than the front.¹⁸ The claw marks of animals can be seen far from the fingers, and claw marks also help us determine direction. The footprint seen in cat. no. 2 is similar to the dog footprint on the brick found in the Roman Bath in Vindolanda.¹⁹ It has the same structure as the footprints of dogs on the tiles in Aizanoi and Perge,²⁰ so we can think the dog breed is similar. The paw dimensions of cat. no. 3 match almost exactly the dimensions of the dog's paw on the tile found in Andriake.²¹ As seen from these similar examples, the dog breed in the Mediterranean basin has similar characteristics. While these findings alone are not enough data to determine the dog type, such data need to be supported by anthropological findings.

Cat. no. 5 has a wall fold of 4.8 cm, a width of 22 cm, and a length of 11 cm. There is a single trace on this brick that consists of five claws. The claw is 5.4 cm long and 4 cm wide and is

¹⁶ Öz 2022, 162.

¹⁷ Bennet 2012, 25-26; Öz 2022, 162.

¹⁸ Bennet 2012, 21; Öz 2022, 162.

¹⁹ Bennet 2012, 14, 22, pl. 4.

²⁰ Oğuş 2021, 232, fragment nos. 1-3.

²¹ Öz 2022, 162, figs. 2.1, 3.1.

interpreted as a paw belonging to a small dog or puppy. Additionally, during the drying phase, the raindrops formed on the brick suggest that it rained on cat. no. 5. These raindrops also suggest that drying was not always done under a roof. An example with similar rain droplets was found in Aizanoi.²² In cat. no. 7, two claw marks are seen that are side by side but pressed on each other. This suggests that the animal may be a puppy. This puppy appears to be bringing its front legs together while stationary. Their claw lengths and widths are close, suggesting they are from the animal's front feet. Cat. no. 8 has a similar structure to cat. no. 7. This dog is also stationary with its front legs close to each other; their directions is almost at the same angle. The length and width of the feet are also close in size. The animal footprint seen in cat. no. 10 belongs to an adult dog and is its front foot. However, it is not known whether it is the right or left foot. The last two pieces on which a dog footprint is seen are the bricks used in the flooring in room no. 8 in the citadel (cat. nos. 18, 23). The foot in cat. no. 18 has a length of 6 cm and a width of 5.9 cm. The footprints here are superficial, and the traces reflect two footprints. The footprint in cat. no. 23 is also superficial, and seven claws were identified. The direction of this footprint could not be determined because the pad of the hind foot cannot be understood from the marks. For this reason, it is exceedingly difficult to follow the trace on the surface of the brick. This is another factor that prevents us from making a clear comment. Footprints similar to those of cat. nos. 1, 2, 3, and 4 are seen at Perge and Aizanoi,²³ Vindolanda,²⁴ Cibalae,²⁵ Brigetio,²⁶ and Kefar 'Othnay.²⁷

The tracks seen in cat. nos. 4, 6, and 9 belong to a jackal. The wall thickness of these bricks is 7.4, 4.5, and 4.6 cm respectively. The claws of the middle fingers are generally pointed towards each other. The claw mark is narrow, the tip is sharp, and the claw marks are close to the nail. The claws are longer and narrower than those of a wolf or dog.²⁸ The footprint seen in cat. no. 4 is quite large, and its claw tips are slightly tapered. This jackal's foot was 8.2 cm long 7 cm wide. In cat. no. 6, the animal footprint is right near the middle edge of the brick. This animal has stepped on the tip of the brick; therefore, it is not possible to identify the animal with this trace. However, the tapering of the claw tips and the nail structure suggest that this print belongs to a jackal. The animal print in cat. no. 9 is located on the broken part of the brick. This makes it difficult to interpret to which animal the tracks belong. Despite this, we can say that the tracks belong to a jackal from the Canidae group. The trace seen on this brick looks complex and careless. The visible mark is deep, and the rear of the claw is the widest part. The reason why this trace looks so complicated is that the animal applied pressure while the brick was very wet. A single animal paw can be seen on these three bricks. Therefore, it is not known whether this animal was moving or not, and it cannot be interpreted to which foot the print might belong. Similar jackal tracks are seen in Perge.²⁹

Footprints of a wild goat (*Capra aegagrus*) can be seen in cat. nos. 11, 12, 13, 17, 18, 19, 20, 21, and 22. A total of 18 footprints were identified on these bricks. This animal belongs to

²² Oğuş 2021, 235, 237, fig. 4, fragment no. 14.

²³ Oğuş 2021, 232-33, fragment nos. 1-4.

²⁴ Bennet 2012, 7-36.

²⁵ Hrvoje et al. 2014, 65, fig. 4.

²⁶ Dobosi 2016, 121-23, figs. 1-2, cat. nos. 1-3 and 10.

²⁷ Bar-Oz and Tepper 2010, 245, fig. 3a.

²⁸ Murie 1954, 94-97; Elbroch 2003, 129-33.

²⁹ Oğuş 2021, 233, fragment nos. 5, 6 and 7.

the Bovidae family and has two hooves. Such animals are frequently seen in regions dominated by steep rocks and bushes. Wild goats continue to live in Alanya Castle today. Kütükçü stated that wild goats have an average foot length of 7 cm and a width of 5 cm.³⁰ Cat. nos. 11 and 12 were found among the bricks belonging to the Pavilion Bath in the Citadel, a Seljuk period structure. The wall thicknesses of these bricks differ from each other. This shows that the two bricks have different uses in the bath as wall and floor bricks. According to our field examinations, cat. no. 11 is the wall brick, while cat. no. 12 is the brick used for heating purposes in the flooring. The wild goat footprint in cat. no. 11 is 5.6 cm long and 3.7 cm wide. A single hoof can be seen. Since it coincides with the broken side of the brick, the other trace of the goat is partially visible right next to the trace. This mark may belong to a kid, not an adult. There are two footprints in cat. no. 12, which are interpreted as prints of the front hoof. The wild goat is thought to be stationary. Cat. no. 13 shows four hooves that are small in size. Therefore, these are traces of a young goat. The fact that the tracks do not face the same direction and the size of the intact hoof on the broken brick differs from each other indicates that there was more than one wild kid.

Cat. nos. 17, 18, 19, 20, 21, and 22 were used in the flooring of space number 8 in the Citadel. These bricks had average dimensions of 31 x 31.3 cm. Their thickness is 7.2 cm. These bricks, made in standard sizes, were produced by a single workshop. However, information about the production center is insufficient. It is believed that the bricks with animal marks are a defective production and therefore cannot be traded. Thus, these bricks were produced and used locally. Cat. nos. 17 and 18 show three footprints each. Two of the traces in cat. no. 17 is back-to-back and almost overlap each other. Although the footprints are close to each other in size, the directions of the steps are not at the same angle. The other footprint is located near the left corner of the brick. In cat. no. 18, the tracks are in the middle of the brick, and two of the three footprints are side by side. The footprint on the right is larger than the footprint on the left. In addition, the traces on these bricks remain superficial. Two interpretations can be made regarding the formation of these traces. The average weight of female wild goats varies between 25-55 kg, while males vary between 45-90 kg.³¹ The first view is that the marks left on these bricks may belong to a goat lighter in weight than a male goat. Another opinion is that the brick has reached the end of its drying phase, and this is the reason why the traces may have remained shallow. There are two traces in cat. no. 19. However, these are not clearly understood because they overlap each other. It is thought that the brick is in the first week of the drying phase, as the goat's hooves on the brick appear deeply impressed and are tangled. Therefore, three hoof prints are evident in the tracks and the fourth of these marks coincides with each other. The length of the footprints on the brick is also suitable for wild goats. In cat. nos. 20 and 21, two footprints are seen which, are shallow. The dimensions of these on cat. no. 20 is close to each other, therefore are traces of the same animal. These traces also overlap each other. In cat. no. 21, two footprints can be seen that overlap each other. Their measurements are close to each other. The dimensions of the front and back foot are almost the same. Therefore, it is difficult to determine whether the footprints belong to the front or hind feet. Again, it is understood from these tracks that the animals were on the move. Three footprints were identified in cat. no. 22. The two prints face the same direction consecutively and belong to the animal's left front and hind legs. These tracks show that the wild goat was moving. The

³⁰ Kütükçü 2016, 35.

³¹ Kütükçü 2016, 35.

other print also faces the same direction and is thought to belong to the animal's right hind leg. The footprints are not perfectly shaped in the superficial traces on the bricks, therefore create the impression that they may belong to another animal. Since the hoof structure of goats is different from other animals, we can say that the tracks in cat. nos. 17, 18, 19, 20, 21, and 22 belong to a wild goat.

The footprints seen in cat. nos. 14, 15, and 16 may belong to domestic goats (*Capra hircus*). A total of four domestic goat footprints were identified on three bricks in Alanya Castle. Two footprints can be seen on cat. no. 14, which are deep and overlap each other. Two more small marks can be seen to the left of this footprint. It is not certain whether the trace belongs to this animal. Such tracks are seen in wild boar and wild sheep. However, when compared to the examples in this subject, the size of the trace is far from the dimensions of these two animals and not suitable for their offspring. Naturally, the drying phase of the brick also affects the depth of the marks. We can also understand from these tracks that the animal was in motion because the traces follow each other, and the weight appears to be on the tips of the feet. A single trace can be seen in cat. no. 15, and this trace is obvious. The footprint is 5.4 cm long and 4.3 cm wide. Considering these measurements, the print in cat. no. 15 reflects the measurements of a goat's foot. Since the single trace seen in cat. no. 16 coincides with the broken area of the brick, very little of it has been preserved. Therefore, it does not provide information about the animal's walk. However, this footprint may belong to a goat. Similar goat footprints to those in cat. nos. 14, 15, and 16 were found in Perge.³²

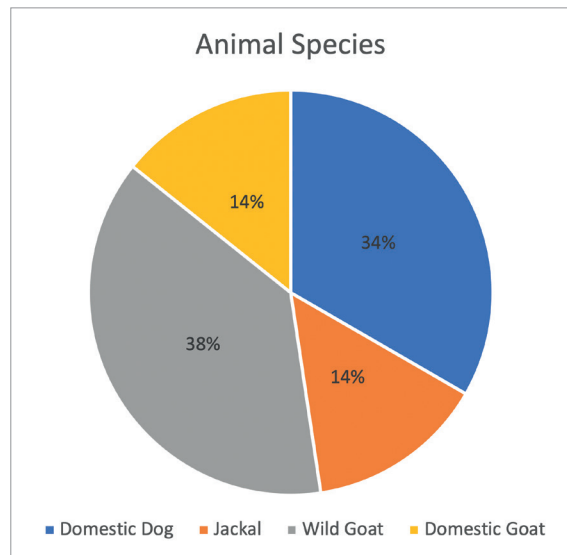


FIG. 1 Distribution of species according to animal tracks seen on tiles and bricks.

Conclusion and Suggestions

Animal footprints were found on 22 bricks and one tile in Alanya Castle. The identities of these animals were determined by the traces on the bricks. The marks on the tiles and bricks belonged to a dog, jackal, wild goat, and domestic goat. The densest group consists of wild goat and dog footprints. After these traces come the jackal. It is not known whether these animals live in Alanya Castle. However, the evaluation of animal bones unearthed during excavations by zoologists and the publication of their data will enable us to obtain information about these animals. In addition, conducting comprehensive research that will shed light on whether the bricks were produced in the castle will eliminate any questions.

Tracks can reflect not only the animals' physical characteristics and gait, but also their behavior. Footprints of animals seen on terracotta are reported and discussed less frequently than other finds in excavations. However, these traces on bricks, tiles, and ceramics need to

³² Oğuş 2021, 236-37, fragment nos. 18-19.

be examined and interpreted in more detail. In this study, the principles of ichnoarchaeology were applied, and the objects were evaluated and interpreted according to its basic principles. As a result of the ichnological evaluation of 23 works, it was determined that all of them had traces of “biodegradation.” The traces were formed on the tiles and bricks by animals that were in motion or entered the area and spent time while they were drying. All of these traces are movement traces.

The distance, depth, and width of the footprints can provide information about the shoulder or hip height of the animals that left the tracks. The depth of the tracks reflecting the deepest parts of the paw print is shaped according to the distance from the animal’s front and hind legs. As can be understood, it is necessary to focus on the pressure applied by the animal while these traces are formed. However, this perspective may not always yield viable results because the status of the drying stage of the bricks is not known when these traces were formed. It is possible to understand this problem with a future experimental application. In addition, considering that the artifacts shrink during the firing phase, it is possible to say that the margin of error in the interpretation of the traces will increase.

In the Canidae group, twelve artifacts were examined, and seventeen animal footprints were identified on these artifacts. The tracks belonged to jackals and domestic dogs. Some of these animals are adults, while other are puppies. While some bricks can be interpreted as the dog’s walking style, on others, there are traces of a single foot. This makes it difficult to determine which foot of the animal the print belongs to. The distinctness of the marks on the examined bricks shows that the canids exhibited a diagonal gait. Nine bricks had wild goat footprints, and three had domestic goat footprints. It is important that we see the footprints of wild goats and domestic goats on the bricks of Alanya Castle. While a single footprint was seen on the bricks in cat. nos. 4, 6, 9, and 15, multiple footprints were found on the other bricks. Thus, the tracks of the animals were generally in motion. Considering the frequent occurrence of pet dog footprints on tiles and bricks, two opinions can be put forward. First, the atelier owner may have bred dogs to protect the production area and its inhabitants from wild animals. The other view is that, if it is assumed that the production workshop is close to the settlement, pets often enter this area. Tiles and bricks were taken from the production workshops and exported to other cities. From this perspective, it is not currently thought that bricks with animal footprints are used as export products. However, if examples where stamps and traces occur together on exported bricks are found, this view may change.

The wall thicknesses and dimensions of cat. nos. 2, 5, 6, 8, 9, 10, 11, 13, 14, 15, and 16 are close to each other. These bricks were produced in the same mould. Mortar and lime residue can be seen in cat. nos. 13, 15, and 16 of these bricks, and these bricks were used in the walls. The wall thicknesses of cat. nos. 3, 4, 7, 12, 17, 18, 19, 20, 21, 22, and 23 are close to each other, so these bricks came from a standard mould. Considering that animals other than domestic dogs and domestic goats live in wild habitats, bricks could be produced both in forests and in places where clay is abundant. Due to its location, Alanya Castle is at a port city where commercial activities were intense during the Roman, Byzantine (Eastern Roman), Seljuk, and Ottoman Periods. There is no source providing information on whether the brick trade was carried out during these periods. For this reason, the city may have produced its own bricks. Nearly square bricks measuring 31 x 31.3 cm were used in the flooring of the last use phase of the Citadel Palace room number 8, and the footprints of a wild goat were found on the bricks on this floor. People of that period did not see any harm in using the part with animal footprints on the upper surfaces of the floor bricks. We see that people living in this period needed

bricks and used them in the space without paying much attention to the marks on them. In Alanya Castle, the bricks used in the Citadel, large cisterns, pavilion bath, vaulted gallery, and palace section were examined on-site. The dimensions of those used in the palace and the pavilion bath overlap with each other. These bricks were produced in the same mould and in the same atelier. Therefore, it is believed that the palace and the pavilion bath were built in the same period. The dimensions of the bricks used in the large cisterns and the vaulted gallery match each other, so it is thought that their production was made in a single atelier. Therefore, these structures were built during the same period. In addition, the bricks of the Seljuk Bath and Old Bazaar (Arasta) located in the Middle Walls of the castle were also examined. These bricks were found to be the same size as those used in the large cisterns and vaulted gallery in the Citadel. Therefore, in the same period or in subsequent periods, managers may have taken a pragmatic approach and used the bricks that were already available.

It should not be forgotten that bricks will be very costly in terms of transport because they are heavy product. For this reason, cities may have focused on local production, and studies on their detection should be increased. The natural traces on the bricks are data that shed light on the environmental conditions of that period. It is anticipated that the increase in such studies will contribute to other fields of study in ichnoarchaeology.

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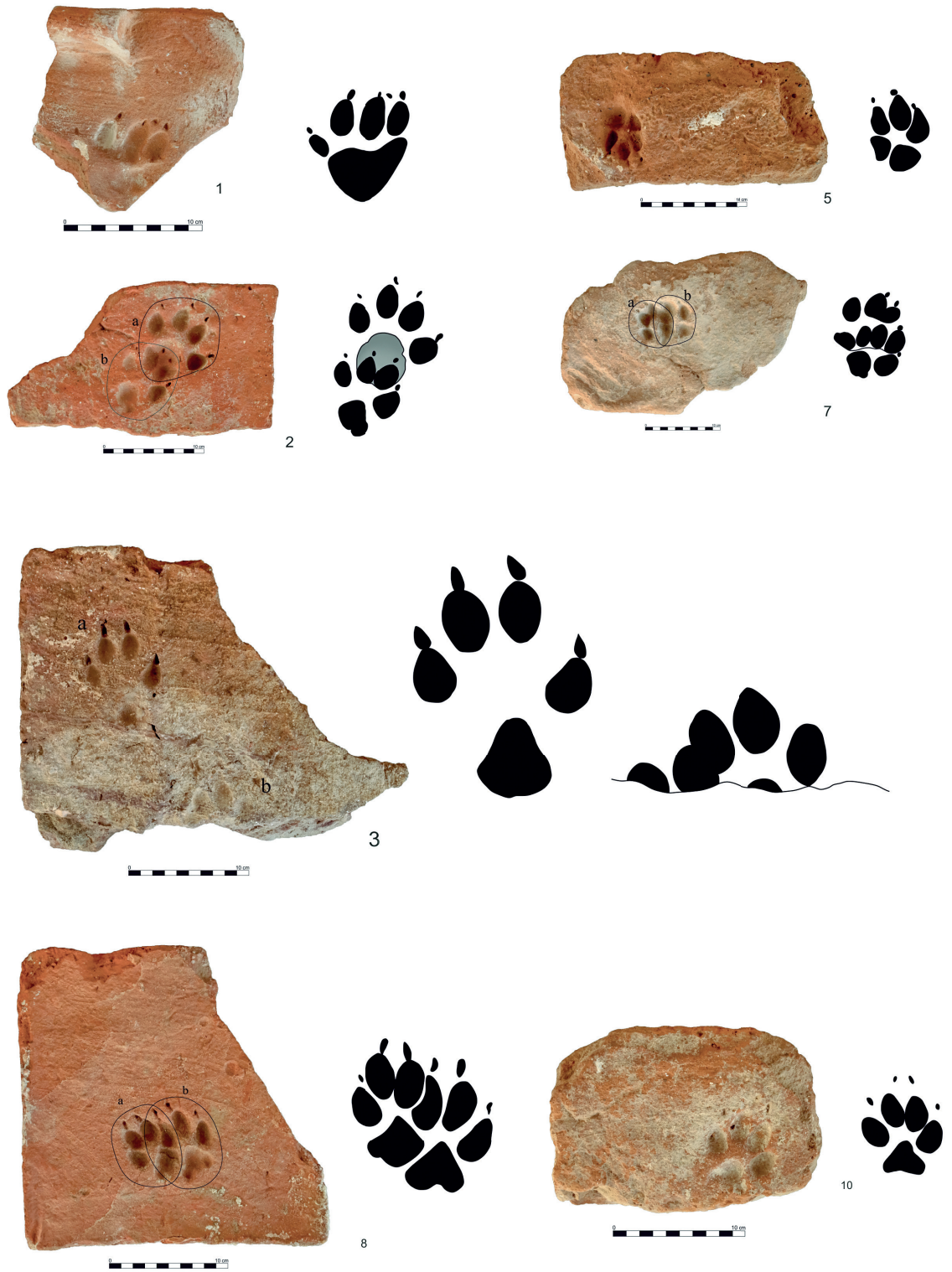


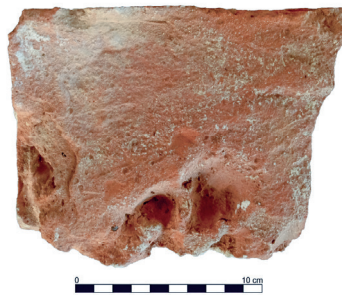
FIG. 2 Cat. nos. 1-3, 5, 7, 8 and 10; Domestic Dog.



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FIG. 3 Cat. nos. 4, 6 and 9, Jackal.

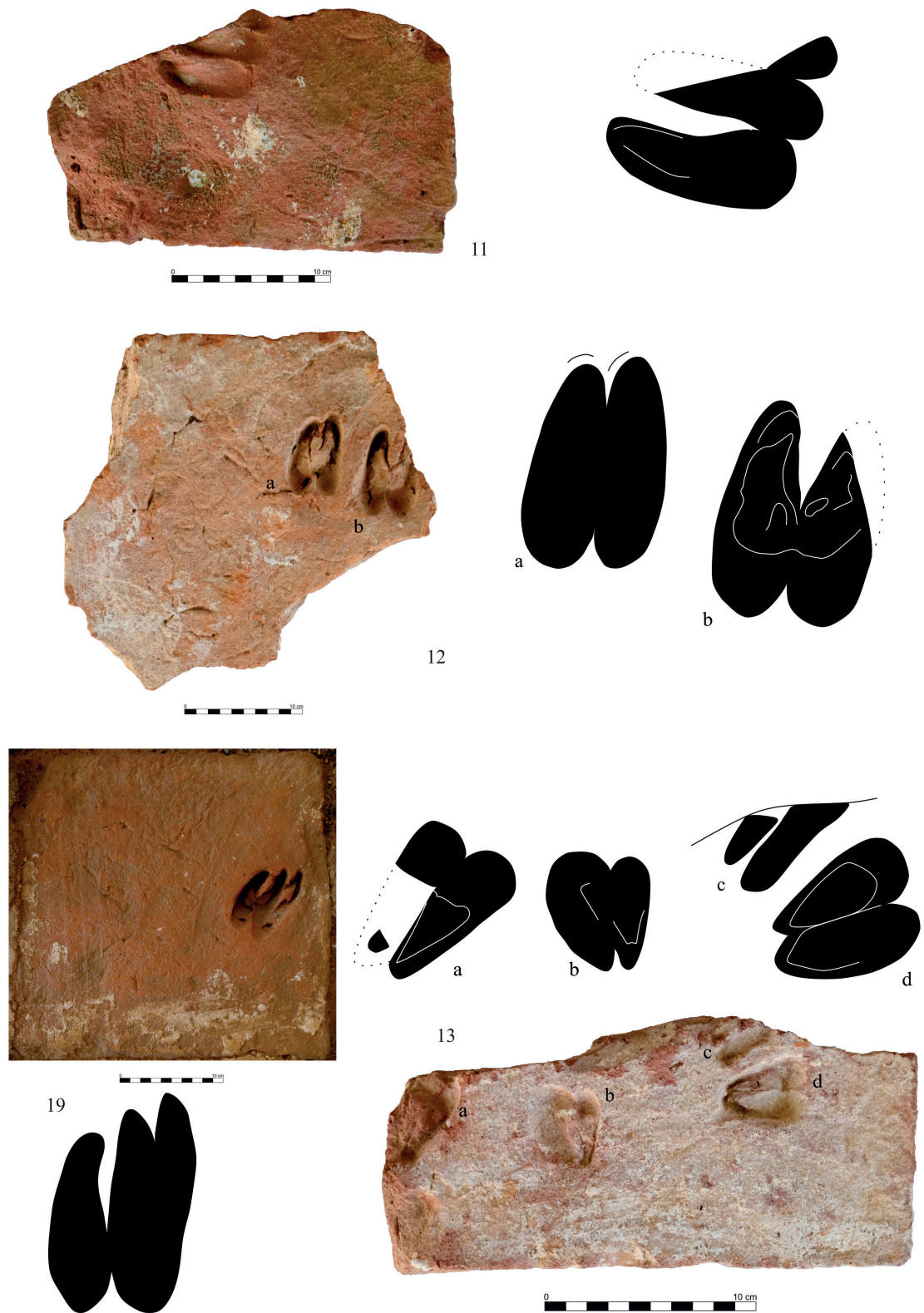
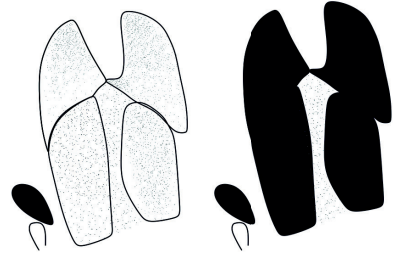
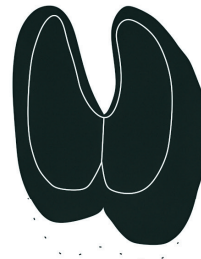


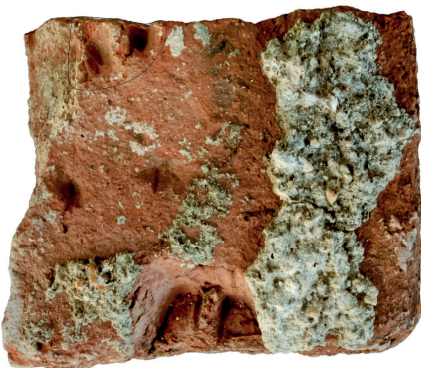
FIG. 4 Cat. nos. 11 and 19, Wild Goat, Cat. nos. 12 and 13, Wild Kidling.



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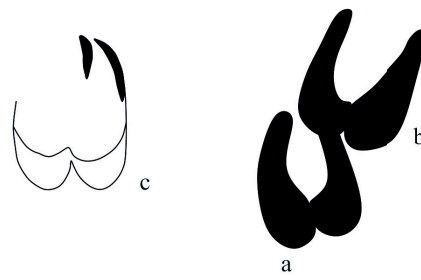


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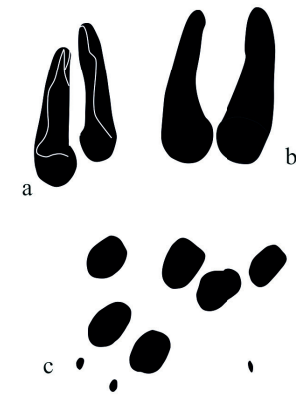
FIG. 5 Cat. nos. 14, 15, 16, Domestic Goat.



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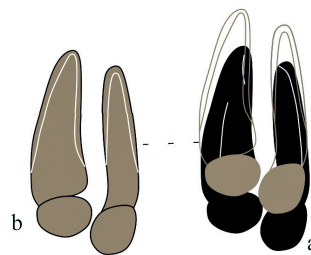
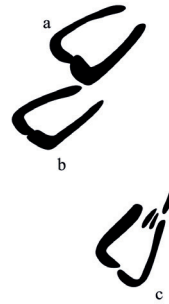


FIG. 6 Cat. nos. 17, 18, 20, 21, Wild Goat.



22



23



FIG. 7 Cat. no. 22, Wild Goat, Cat. no. 23, Domestic Dog.

