



www.maajournal.com

*Mediterranean Archaeology and Archaeometry*  
Vol. 19, No 2, (2019), pp. 119-134  
Open Access. Online & Print.



**DOI: 10.5281/zenodo.3340095**

# **ARCHAEOLOGICAL PROOF OF ENJOY AT TİRE KUTU HAN: CLAY PIPES**

**Hasan Uçar**

*Department of Art History, Faculty of Letters, Ege University, İzmir, Turkey*  
([hasan.ucar@ege.edu.tr](mailto:hasan.ucar@ege.edu.tr))

**Received: 19/06/2019**

**Accepted: 22/07/2019**

---

## **ABSTRACT**

This paper deals with the Ottoman clay pipes found during the excavations carried out at the courtyard of Kutu Han, located at Tire district of İzmir, in 2012. Plentiful ceramics of the periods before and after the construction of the han building were discovered in the excavations of 2012 for restoration in the building, which was constructed in 1429. Besides unglazed ceramics, imported and domestically produced cups are also available among the finds of the 18th-19th centuries. These cups prove that a coffee house known to have existed at the han in the Republican Period had existed in the Ottoman Period too. During the excavation, red, white and grey paste pipes were found which were of 18-19th centuries' production. The surfaces of some pipes are slipped and burnished. The pipes were shaped with two methods in terms of the production technique. Of the pipes divided into two groups as elbow and elbowless pipes according to their shapes, the elbow pipes were mold-made, whereas the elbowless pipes were wheel-made. It's aimed to introduce and emphasize the position of the pipes found in this form and the ones found in the other regions of Ottoman Empire.

---

**KEYWORDS:** Excavation, chibouk, pipe, decoration, mold.

---

## 1. INTRODUCTION

The shapes of the items such as plates, bowls, pitchers etc. that human beings use in everyday life may vary according to the material they are made of, the type of substance to be placed in them, and – the most important of all – the level of the production technology of the society using those items. The geographical location of the society using these items as well as their commercial activities, income level



Figure 1. The locations of Izmir and Tire on the map of Turkey.

The position of clay pipes with a significant place in everyday life in the Ottoman geography in the 17th-19th centuries among the items of everyday use is rather different. When compared with the open or restricted common ware in terms of function, it is seen that the pipes were designed to place a single material into the chamber, as in the case of an ink-well or a money box. Tobacco, the smoke of which was used as a pleasure-inducing substance by placing it into the pipe bowl, was brought to the European continent, which included the territories of the Ottoman State as well, after the discovery of America by Christopher Columbus. It was a plant which was used both as a pleasure-inducing material and during religious rituals in the territories it belonged to (Goodman, 1993; Yılmaz, 2007: 3,4).

It is favorable to summarize the content of this text as the use of tobacco and other herbs before tobacco arrived in Ottoman Empire in and out of the Anatolia chronologically. In Australia aboriginal people started to chew on the tobacco and its variances, and 2000-3000 years BP native Americans started to use wild tobacco variances. In fact, residue analysis of archaeological pipes using gas chromatography/mass spectroscopy (GCeMS) analysis provided an alternative means to trace the origins and spread of tobacco and other smoke plants (Tushingham et al., 2018, 2013). Though today there are no pipes or pipe-like fragments recovered in archaeological strat dating to prehistoric periods it may have been used by other means of inhalation (Spiller et al., 2002).

and openness or closedness also enabled the shapes and decorations of the items of everyday use to be analogous to, or different from, those of the other societies. Especially the extensiveness of the areas of use of the material placed into an item unavoidably gave rise to the occurrence of standard types. Such materials and items as coin-money box, coffee-cup, and tobacco-pipe can be shown as examples of this case.



Figure 2. View of Kutu Han

With the cultivation of tobacco in the 1400-1000s B.C, its importance in daily life increased distinguishably. In Mesopotamia, Sumerians used opium and weed for medical purposes. In 5th century B.C, Scythians would inhale the smoke of a herb. And this attribution in the illustrations of Athen's vases. After the exploration of America by Columbus, sowing of a new plant after opium and weed started in Europe and Asia in which also Ottoman Empire stood. (Goodman, 2005: XIII-XVI; Bakla, 2007: 16-21)

In the 17th century, it's thought that the pipes used in Ottoman Empire were not rich in sort but there were only a few types. In this century the pipes are usually white paste. And in the 18th century, the form variety increased as well as the color variety. In the first half of the 19th century, we can see that there is a standardization in the pipe types. Also, as of the first quarter of the 20th century, the pipe production slowly faded away whilst cigarette became widespread more and more (Ward and Baram, 2006, 144-145)

Both the sowing and use of this plant, which succeeded in drawing the attention of all European countries as of the second half of the 16th century, soon flourished. Even though it is not exactly known when it entered the Ottoman territories, this date is thought to have been the late 16th century or the early 17th century. It was initially used for medical purposes in the territories it entered but later began to turn into a pleasure-inducing material (Yılmaz, 2007:11). This continued likewise in the Ottoman

Empire too. The adoption of tobacco in the Ottoman Empire rapidly enabled its sowing and use to flourish. This flourishing gave rise to the reactions by both the government and the religious scholars and caused it to be discussed continuously. The first ban on tobacco was imposed in the reign of Ahmed I, while the heaviest one was imposed in 1633 in the reign of Murad IV. These bans failed to prevent tobacco from progressing in the Ottoman geography. The fact that tobacco was an important source of income changed the perspective of the government on it and both the sowing and use of tobacco were finally legalized in the late 17th century (Bakla, 2007; Yılmaz, 2007; Erim, 2007).

The use of tobacco provided the production of items of use that were specific to it. The use of the smoke of plants as a pleasure-inducing substance has generally been provided by means of chibouks since the ancient period. Traveler Jan Nieuhoff mentioned the pipes in Southern Brazil whose bowls were made of walnut shells and whose chibouks were made of hollow branches. This pipe shape is thought to have been the pioneer of the tobacco chibouks used in the Ottoman Empire, Iran, and the Far East (Bakla, 2007).

Upon the use of tobacco as a pleasure-inducing substance, the information on pipes – one of the most important materials of everyday life – is increasing with every passing day. The greatest share in this undoubtedly belongs to the archaeological excavations which enabled the examples of pipes to multiply. Either few or plentiful pipes unique to the Ottoman Empire are obtained in almost all excavations carried out in the areas where the Ottomans settled. Tire Kutu Han (Fig.1, 2), where the pipes constituting the content of our study were found, is dated to 1429 (Ertekin, 2008:14). This building is included in the group of hans *which have a single courtyard and which are two-storey and entirely porticoed* among the Ottoman city hans (Ersoy, 1994:91). Besides the pipes, plentiful ceramics of both the Period of Principalities and the Ottoman Period were discovered during the excavations carried out at this han. Especially the examples of the 18th and 19th centuries are at a noteworthy amount (Uçar & Uçar, 2018). The coffee cups, one of the most important objects of the coffee culture of the 18th-19th centuries, among these ceramics explicitly prove the existence of a coffee house at the han. In addition, when the pipes and the cups found during the excavation are evaluated altogether, it is seen that they all but consolidate the relationship between coffee and tobacco at an Ottoman han. All the pipes and cups discovered during the excavation are broken. With the introduction of these clay pipes found in different

forms, the position and typology of the pipes found in a commercial building is critically assessed.

## 2. MATERIAL

The place of the pipes, widely used in the Ottoman Empire, in everyday life was different from that of the other common terracotta ware. They were among the most used items in everyday life, which did not make them ordinary materials. On the contrary, the pipe masters acted considerably meticulously when selecting the materials. In line with the published examples and the finds in the collections, the materials used to make these objects of everyday life are various. Stone, metal, wood and clay are shown among the materials used to make pipes (Robinson, 1985:157; Van Der Lingen, 2003: 131). When the extant pipes are grouped according to their materials, it is understood that clay pipes were used the most. The structures, surface characteristics and shapes of the clay pipes from Kutu Han, which make up the content of the paper, indicate that they were made by two different groups of masters. The elbow-shaped pipes with considerably hard, homogeneous, and very sparsely porous texture were produced by pipe masters. The paste of these pipes is white, red, and grey. On the other hand, the moderately hard and porous elbowless pipes with rather rough and carelessly done exterior faces were made by potters. When the structure of these pipes is compared with the paste of the other wheel-made common ware, it is understood that they are considerably analogous. This analogy shows us that the potters produced both common ware and pipes with the same clay. The paste colors of both wheel- and mold-made pipes are in the shades of red.

There are two types of slip use in the pipes from Kutu Han. In the first one, the surfaces of some of the mold-made pipes were slipped. While red slip and cream slip are seen on the surfaces of the red-paste pipes, a group of grey-paste pipes have sour cherry-colored slip. When the shapes of the grey-paste pipes are also evaluated, these pipes must have been produced at the same workshop. However, the second use of slip is for decorative purposes and this use is predominantly seen in the wheel-made elbowless pipes by potters. Diagonal linear decorations are seen on the rough surfaces of the pipes, particularly on the neck. These decorations are all of an identical type.

## 3. TECHNIQUE

The production of pipes, which are among the smallest of the Ottoman items of use in terms of their sizes, is rather laborious as compared with the other common ware made of clay (e.g. plate, bowl, and jug). The valuableness of the tobacco burnt in its

bowl caused it to be used economically. The level of accessibility of tobacco also influenced the sizes of pipes (Fındık, 2016: 377). Although they have a fragile structure among the items made of clay, they are among the objects over the manufacturing of which pains were perhaps taken the most within unglazed production. These pipes were made in two ways as with molds or wheels.

### 3.1 Mold-made pipes

Molds were used to perform the mass production of the pipes with identical sizes and shapes (Fig.3: a-x; Fig.4-6; Fig.7: a-g). The manufacturing of pipes of an identical type resulted from the use of molds in production rather than a requirement or a demand. Despite the differences among them, the mold technique – an essential production technique in the Seljuk Period and the Period of Principalities – revived in the Ottoman Period with the production of pipes. Production with molds provided the decoration of pipes besides their shaping. After the mold-made pipes had been retouched, decorations were optionally made with the other techniques. Wooden, bone and metal materials were used when making these decorations and the pipes were fired in a special kiln (Robinson, 1985: 157; Bakla, 1993: 62; Šiš a-Vivek & Filipec, 2013-2014: 306).

It is striking that some of the mold-made pipes from Kutu Han were burnished (Fig.4: p,r,t; Fig.5: d,f,h,i,n,r). By burnishing the pipes, their surfaces were provided with a glossy appearance. The overwhelming majority of the pipes are unglazed, which is ascribed to the fact that the production of glazed pipes was rather laborious and difficult (Bakla, 2007:194). This challenging process caused the pipe masters mostly to burnish the pipes they produced. Burnishing is seen on the surfaces of the mold-made pipes out of the red- and grey-paste pipes. In this way, the pipe's surface was provided with a glossy appearance like glaze. All white-paste pipes are unburnished (Fig.4: a-g). On the other hand, a group of red-paste pipes look different from the others. Whilst the cores of the pipes are red, their surfaces are black (Fig.7: a-f). The change in color on the surfaces of the pipes is generally provided with the slip, whereas a different technique was applied in these pipes. The burnished surfaces of the pipes turned black through reduction firing. However, differences in the surface color draw attention in some pipes. This is also caused by the changes in the firing atmosphere. Given the black surface color of the pipes and the technique of formation of this color, we may state that the black burnished ceramic production technique of thousands of years in Anatolia was also maintained in the Ottoman Empire and that the most striking examples from this period are the pipes [1].

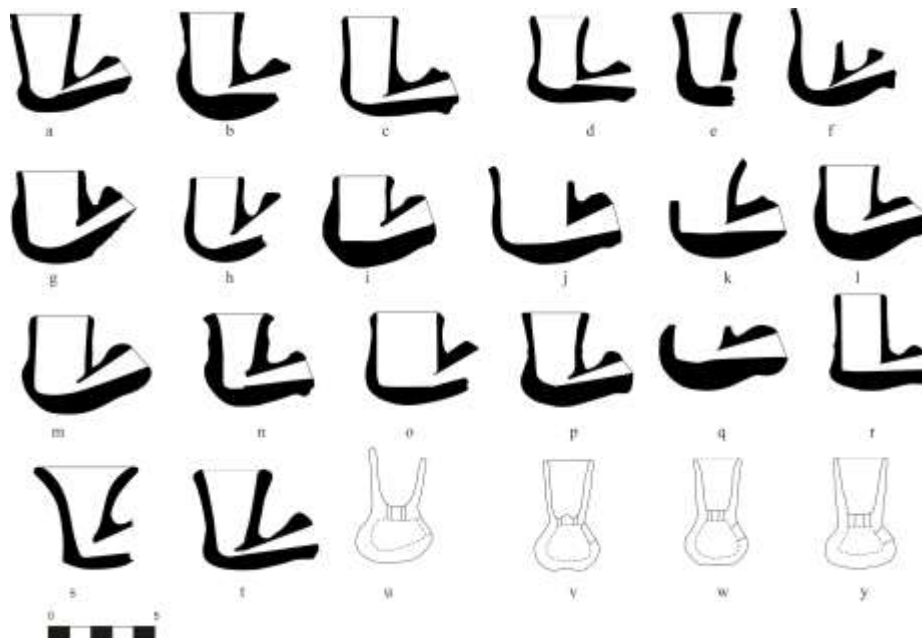


Figure 3. Elbow pipes (a-t); elbowless pipes (u-y).

### 3.2. Wheel-made pipes

Preferred in the production of open or restricted common ware, the potter's wheel was also used to make pipes. They are completely distinguished from

the pipes produced in the first group by their shapes (Fig.3: u-x; Fig.7: h-p). The elbow-shaped appearance in the mold-made pipes is unavailable in this group. Hence, the cylindrical or conical stem is unavailable

in these examples. By making holes on a handmade and disc-shaped fragment, this disc was placed at the beginning of the neck of the wheel-made pipe and two parts were created on the pipe. With their appearances, these pipes remind one of the jugs with a sieve that belonged to the Seljuk Period and the Period of Principalities. The neck part of the pipe was converted into a tobacco bowl, whereas its lower part was converted into a smoke chamber. The pipe was used by inserting a chibouk into the hole made on this part.

#### 4. TYPES

The chibouks of these pipes – one of the most demanded products of a period – and the mouthpieces inserted into these chibouks failed to survive up to the present time. The bowls and stems that make up the pipes with different shapes and that are evaluated within two main types below are analogous in some groups but different in some others. The bowl, the part into which tobacco is placed, is made up of two sections as the body and the neck. Whilst the distinction between the neck and the body in the pipes was clarified with a thin ring or a stamped decoration in most examples, this distinction is not seen in some of them. The general practice is that different decorations were provided on the body and the neck. The examples containing the same decoration on both the body and the neck are rather limited. The examples with an undecorated bowl are also few. Of the decorations, the majority of the grooves on the bodies were mold-made. On the other hand, the stamping technique was frequently employed to make the other decorations. The body shapes have three kinds, namely spherical, hemispherical, and oval. Since the shape of only one of the examples exactly resembles a lily with its flaring mouth, no distinction between the body and the neck was made and this pipe was called the pipe with a lily shaped bowl. In the bowls, the neck is mostly conical. Some of the conical bowls are polygonal. The sharpness at the rims of such bowls was softened.

The stem, which is connected with the bowl with an angle and into the tip of which a chibouk is inserted, is cylindrical or conical. Almost all pipes terminate with a protuberant ring. The connection of the stem with the bowl was made by means of a narrow opening on the keel. The overflowing hole on the stem of a pipe is interesting (Fig.4: h). It is thought that a chain with a pin was inserted into this hole in order to clean the pipe bowl [2]. The use of pipes together with a long chibouk by putting them on the ground affected the manufacturing of the stem and the bowl with an angle. Thus, the lower parts of the pipes are keel-shaped. Hence, unlike the

other ceramic products, these examples do not contain any flat base or a base. Whilst the keel has a triangular profile in the overwhelming majority of the pipes, it has a rectangular profile in some examples. The overwhelming majority of the keels were clarified by roulette stamping.

The classification of the Ottoman pipes, composed of two main parts as briefly introduced above, may vary according to the abundance of the pipes found during the excavations or the geographical location of the excavated area. The pipes discovered at Corinth and the Athenian Agora were evaluated in three different types as *rounded bowl*, *disc-based*, and *lily-shaped* by C. Robinson (Robinson, 1985:163). On the other hand, the pipes found during the excavations of Saraçhane were divided into main types as *fine grey early types*, *early red-ware pipes*, *red-burnished pipes*, *late types*, *late Bulgarian types*, and *other pipe bowls* by J. Hayes and the pipes in these types were classified into 27 different subgroups according to their bowl, rim, and stem shapes as well (Hayes, 1992: 392-394). Having made studies on the Ottoman pipes, E. Bakla divided the pipes into types as *white*, *red*, *black*, *camel*, *red-slipped pipes over white*, and *glazed pipes* according to their clay and exterior surface colors (Bakla, 2007:130) but as *conical bowls*, *tulip-shaped bowls*, *hemispherical bowls*, *hemispherical bowls surmounted by a cylinder*, *crater-rimmed bowls*, *crater-rimmed bowls on a flower-shaped base*, *bowls in the shape of octagonal cylinders*, and *bowls shaped like a flattened sphere* according to the tobacco bowls (Bakla, 1993:52-53). Having carried out studies on the Ottoman pipes, G. Ayhan also grouped the pipes as *cylinder bowl*, *sack-like bowl*, *carinated bowl*, *rounded bowl*, *flattened rounded bowl*, *sieve flattened rounded bowl*, *tulip bowl*, and *rectangular bowl pipes* according to their bowl shapes but as *base and sieve bowl*, *cylinder base*, and *disc base* according to their base shapes (Ayhan, 2010a: 1,2; Ayhan, 2011a: 55-56). A. Yener classified the pipes found during the excavations at Kaleiçi, Antalya as *early pipes*, *pipes with a round bowl*, *disc pipes*, *tulip-shaped pipes*, *bell-shaped pipes*, and *pipes with a chamber* (Yener, 2005).

There are both analogies and differences in the shapes of the pipes from Kutu Han, which were produced from white, red, and grey paste with two different techniques. When the bowls and stems of these pipes are evaluated together, it is understood that they are made up of two main types as *elbow type* (Fig.3: a-t) [3] and *elbowless type* (Fig.3: u-y). The production technique of a pipe is considerably important in the distinction of types. The mold-made pipes have an elbow, while the wheel-made ones lack an elbow. The pipes from Kutu Han must have been produced in the 18th-19th centuries in line with their parallels.

#### 4.1 Elbow pipes

As the stem was connected with the tobacco bowl with an angle, the pipe acquired an elbow-shaped appearance. The angle of the stem may vary. This type is seen in the red-, white-, and grey-paste pipes. It is the most common type among the Ottoman pipes. The pipes in this group, whose shapes can be understood exactly among the pipes from Kutu Han, can be examined in 6 different subgroups.

1. Pipes with a spherical-bodied and conical short-necked bowl and a cylindrical stem (Fig.4: f,j,o,t; Fig.5: a-e).
2. Pipes with a hemispherical-bodied and cylindrical/conical long-necked bowl and a cylindrical/conical stem (Fig.4: a,b,k-n, Fig.5: g,h,l).
3. Pipes with a hemispherical-bodied and conical long-necked polygonal bowl and a cylindrical/conical stem (Fig.7: a-c).
4. Pipes with a hemispherical-bodied and cylindrical/conical short-necked bowl and a cylindrical/conical stem (Fig.5: f,i,j)
5. Pipes with an oval-bodied and conical/ cylindrical long-necked bowl and a cylindrical/conical stem (Fig.4: i; Fig.5: m; Fig.7: e,f).
6. Pipes with a lily-shaped bowl and a cylindrical/conical? stem (Fig.5: n).

#### 4.2. Elbowless pipes

Since all pipes in this group were wheel-made, their shapes are considerably analogous. The pipes appear simpler due to the presence of no cylindrical or conical stem, unlike the elbow pipes. A single type as the pipes with an oval-bodied and conical-necked bowl and a sieve (Fig.3: u-y; Fig.7: g-p) is seen in this group of pipes from Kutu Han. Although differences are seen in their sizes, their shapes are almost identical. Two parts were created on the pipe by placing a disc-shaped sieve at the beginning of the neck. The upper part, i.e. the neck, was used as a bowl (chamber). By converting the oval body into a smoke chamber, an appearance differing from those of the elbow pipes was provided. A hole into which a chibouk would be inserted was made on the body. Such pipes are thought to have been used to smoke such substances as opium and hashish besides tobacco (Humphrey, 26 April 1990: 6; Wood, 1998: 329; Ayhan, 2010b: 54). Analogues of the elbowless pipes with a sieve were frequently used in the Ottoman geography [4].

### 5. DECORATION

The adoption of tobacco and pipes by the society led to an increase in the demands for both of them. These demands provided an increase in the number of pipe-making masters at many points of the em-

pire. Although the mold-made pipes had identical shapes, the pipe masters designed unique pipes with their most delicate decorations. They decorated not only the pipes but also the other vessels they produced from the same clay with the same care (De Vincenz, 2016: 119). Although the majority are geometric, the plant, figured and inscribed decorations are analogous in some pipes but different in some others. The greatest factor in this difference is the use of different techniques in decoration, namely the mold technique, the mold stamping technique, and slip painting.

#### 5.1 The mold technique

This technique allows transferring the decorations on the mold's surface onto the pipe's surface while shaping a pipe in the mold. Even though the mold-made decorations are rather limited, the shapes or sizes of the decorations may be different. The most common decoration on these pipes is the grooved decorations which provide the further clarification of the bowls. The bowls were grooved with eight different arrangements. Firstly, only the body was decorated with vertical grooves. Such decoration is the most common type (Fig.4: a,c,h,m,q; Fig.5: o-p, Fig.6: s, Fig.7: a,b). The second one is that half of the body was made grooved (Fig.4: f). The third one is the decoration of the neck with grooves by leaving the body undecorated (Fig.7: e,f). The fourth one is that almost the whole surface of the bowl was grooved (Fig.5: e). The fifth one is that the grooves on the bowl were made wider (Fig.4: e). The sixth one is that they were sometimes provided with the appearance of a leaf greatly skillfully through the angles of the depths on the surfaces of the grooves (Fig.5: g). However, the seventh arrangement is considerably interesting. Whilst the grooves are standard in width in almost all grooved examples, a different appearance was created on the surface by placing thinner double grooves between the thick grooves in one example (Fig.6: a). The last arrangement is the decoration of the bowl with horizontal or diagonal grooves but not with vertical grooves. Analogous pipes were also found at Smyrna (Ayhan, 2011b: 14, Res.11) and Ramla (De Vincenz, 2011: Fig.1/7). With this appearance of its, the pipe bowl connotes an Ottoman turban (Fig.5: a).

Another mold-made decoration is the rings. Being at the rim of the stem in the overwhelming majority of the pipes, these rings may vary by shape. The rings, some of which are thick but some of which are thinner, are among the most marked elements of the stem. Nevertheless, the one on the body is thinner than those on the stem and generally borders the grooves on the bowl.

Besides grooves and rings, another mold-made motif is the lozenge pattern. A row of lozenge patterns is available above the stylized leaf motifs created with grooves (Fig.5: g).

## 5.2 The stamping technique

After a pipe had been mold-made, some decorations were also made by stamping. When compared with the mold technique, it is seen that the distribution of decorations on the pipe's surface depends on the shape of the mold, whereas the arrangement is controlled by the pipe master in the stamping technique. Although it is debatable who prepared the stamping tools, the master created the composition by means of these tools as he wished at the point he desired on the pipe's surface. The decorations made by stamping are more diverse than the decorations made with the mold technique. They have two types as with roulettes and molds.

### 5.2.1 Roulette stamp

It is the most common decoration. By moving roulettes of different widths on the pipe's surface, the decorations on the roulette's surface were transferred onto the pipe's surface. The most frequently used one is the cogwheels. Differing in width, these roulettes have considerably diverse areas of use on the pipe's surface. Cogwheels were frequently preferred on the ring on the stem, on one side or both sides of the ring on the bowl, and in the clarification of the keel. Furthermore, such a decoration was also provided between the vertical grooves in some examples, while the body of an example was decorated on the horizontal axis by means of a cogwheel. Examples decorated with a cogwheel were obtained at many centers in the Ottoman geography. They can be shown as an indispensable type of decoration on the Ottoman pipes. Even though roulette stamps were frequently seen on the pipes in the 18th and 19th centuries, they were also available on the red-paste glazed ceramics. They are among the noticeable decorations particularly on the exterior faces of monochrome glazed and slip-painted bowls and plates. They are frequently encountered on the ceramics made at such production centers as Çanak-kale and Didymoteicho (5). Analogues of these decorations, seen on the pipes from Kutu Han, are also seen on the pipes found during the excavations in Croatia (Brusic, 1987: 477, Tab.III/II), New Palace in Edirne (Cengiz, 2011: 141, Kat.158), in Timișoara (Gașpar, 2016: Fig.9), at the Fatih Foundry in Demirköy (Uysal, 2007: Res.9), as well as on the pipes in Zadar National Museum (Gusar, 2008: 153, Tab.4/2).

Just like cogwheels, grooved wheels were also frequently used on the surfaces of the pipes. Their most

common use is to clarify the keel, as in the case of cogwheels. They can be seen either together with a cogwheel or singly on the surfaces. Both the pipe bowl can be decorated with grooves in the mold and the grooves can be made after it has been removed from the mold. These grooves were created by means of grooved wheels rather than incising. It was intended to create a leaf motif on the body by means of grooved wheels or cogwheels (Fig.5: d,f,k). Analogous decorations are common on the pipes, as in the examples found in Croatia (Brusic, 1987: 476, Tab.II/12), Ochakiv (Beliaeva, 1999: 351, Res.11) and at Corinth (Robinson, 1985: Plate 55/C85).

Although the grooved wheels do not draw much attention independently on the pipe's surface, they are one of the considerably striking motifs when they are arranged together with the other decorations. They acquired the quality of being a bordering line by encircling the other decorations created with the stamping technique (Fig.4: s; Fig.5: r; Fig.6: h,n). With these characteristics, they remind one of the underglaze painted blue lines on contemporary Kütahya cups. Hence, the pipe masters showed their creativity by applying those lines that the cup masters applied with paint on the pipe's surface by means of roulettes. The pipes found during the excavations carried out at Tulcea County (Iuliana, 2013: 290, pl.9/48) as well as at Hârșova and Iași (Bilavschi, 2017: 238, pl.2) can be shown as examples of this feature, which is encountered on many pipes.

Whether made when a pipe was in the mold or by means of a roulette after it had been removed from the mold, grooves are one of the most common decorations on the surfaces of pipes. Given the examples of these grooves on other materials, it is easily understood that the grooves on different materials were in harmony in the 18th and 19th centuries. For instance, the decorations called oyster shell shapes, floral motifs or solar motifs and widely encountered on the stone artifacts in the 18th century and the grooves created on pipes are very analogous. The grooves placed in the wheel of fortune order on the tombstones or the ornamental slabs of fountains can also be shown as examples of the grooved decoration in stone decoration (6). The most striking type containing grooves apart from stone decoration is the coffee cups. Some coffee cups were also made grooved, which shows us the harmony of the duo of tobacco and coffee or of a cup and a pipe [7].

The pipes were also decorated by means of wider cylindrical seals with plant or geometric decorations, along with cogwheels and grooved wheels. These decorations are predominantly available on the bodies, necks, and stems of the pipes as well as, rarely, on the keel (Fig.4: j,k; Fig.5: t; Fig.6: e,l,s). The decorations predominantly contain lattice or lozenge pat-

terns. This type of decoration is frequently encountered on pipes, as seen in the examples found at Tell Yoqne (Avisar, 2009: 100, Fig.2.4/2,6), Tell el-Retaba (Rzepka et al., 2015: 138, Fig.66), and Akko (Shapiro, 2016: 98, Fig.1/2).

### 5.2.2 Mold stamps

Apart from grooved wheels, cogwheels, and the roulettes with plant and geometric decorations, decorations were also made with stamp-shaped molds. Unlike the roulettes, the decorations were made by stamping onto the pipe's surface like a seal. It was intended to create a composition on the surface with decorations of an identical type sometimes with single stamps but sometimes with multiple stamps. The decoration repertoire is wider than that of the roulettes. Geometric, plant, figured and inscribed examples are available among the finds. The most common motif among the geometric motifs is the stamps with a lattice decoration (Fig.4: d,n; Fig.5: j). These decorations resemble the lattice decorations on the cylindrical seals. Analogous decorations are also available on those found in Dubrovnik (Milošević & Topić, 2011: 101, Plate 63) and during the City Wall Excavation in Akşehir (Tanrıveren, 2015: 107) as well as on the pipes in Istria Archaeological Museum (Zejnilhodžić, 2012: 186, Cat.37).

The rayed dot motif – although it can be likened to a flower – is one of the intensively seen motifs on the Ottoman pipes, with it being more frequent on the pipes with a bodied and polygonal-necked bowl. At the center of the motif is a dot, with rays spreading around from this dot. Its sequence in an example is quite striking. The inside of the border which was bordered by a cogwheel at the bottom but by a groove at the top was decorated with three rows of rayed dot motifs (Fig.6: q). Pipes containing an analogous motif were also found during the excavations at Corinth (Robinson, 1985: 176, C.25) and in a shipwreck in the Black Sea (Batchvarov, 2014: 13, Fig.10).

It is also striking that plant decorations were created on the pipe's surface by means of geometric molds. The decorations on the body of a red-paste pipe, as in the pipes found in Azov Museum (Khalil & Rudolfovna Gusach, 2018: 252, Pic.13) and during the excavation at Corinth (Robinson, 1985: Pl. 48, C16), can be shown as examples of this. Relief leaf motifs formed in the empty spaces remaining in between as a triangular mold with concave edges was stamped at the rim to face the mouth and the body. We encounter the most striking examples of an analogous plant decoration with the underglaze painting technique in İznik and Kütahya ceramics in the Seljuk Period and later in the Ottoman Period. This is important in that the sequences of leaves are reflected on the pipes with a different technique. Moreo-

ver, by stamping the same mold downwards with equal spaces immediately below these motifs, leaf motifs were created on the body together with a grooved wheel (Fig.5: k). In a white-paste pipe, the body was decorated with more realistic oval leaf motifs by stamping a "Y-shaped" mold again with equal spaces (Fig.4: b).

Decoration with triangular molds was not merely made on the bodies of pipes. The plant arrangement on the ring was clarified by stamping these molds onto the rings on the stem too. However, a different variation of this arrangement was made by means of a triangular mold with a lattice decoration. Rows of medallions were created with a mold stamped with specific spaces, at the same level, and in different directions and circular molds with a small diameter and with pointed tips were stamped at the center of these medallions (Fig.5: r). An analogous decoration draws attention on a different pipe too. A single row of decoration was created on the body by means of a circular mold with triple concentric rings; triangular molds were stamped between the decorations with concentric rings; and the decorations were clarified. Given the concentric rings, they remind one of the decorations at the centers of the contemporary ceramics produced in Didymoteicho, Eyüp, and Çanakkale in the 18th-19th centuries (Fig.5: i,s; Fig.6: c). Nevertheless, a different variation of this mold is the mold whose circle contains cogs. In the decoration made with this mold, cogs are present on the edge of the concentric rings within the circle (Fig.6: i). As also seen on the pipes in Azov Museum as well as on the pipes found during the excavations in Jerusalem (Simpson, 2008: Fig.270/68), concentric rings are quite marked among the motifs the majority of which have corners.

When the decorations on the bodies of the pipes are evaluated, it is understood that decoration was also made by means of the circular molds with pointed tips. A border was created on the body of a pipe by means of a grooved wheel and a single row of circular decoration was made on the horizontal axis in the middle of this border (Fig.6: h). Motifs quite analogous to this motif are also seen on the pipes found during the excavations at Corinth (Robinson, 1985: Plate 60, C132-133), Crete Medical Faculty (Evely, 1988: 140, Fig.4/2), and the Archeopark in Bursa (İnanan & Şahin, 2017: 52, Tablo 5/g), with a difference in arrangement. The leaf motifs created with grooves on the body of another pipe by means of an analogous mold were clarified (Fig.5: d). Apart from triangular and circular molds, decorations were created by means of the molds with a lozenge pattern too. As seen in the example from Kaleiçi in Antalya (Yener, 2015: 97, Çiz. II. 13), the body of a pipe found at Kutu Han contains a lattice decoration (Fig.7: c).



The plant motifs were made with the stamping technique in two ways. As described above, the first one is the creation of plant decorations on the pipe's surface by stamping geometric molds in different directions. The second one is the formation of a decoration on the pipe's surface directly by means of the molds with plant decorations (Fig.5: f). With this method, the pipes were generally decorated with small-sized plant motifs. The decoration on a pipe has a special place with both its size and shape among the plant decorations. A circular center was created in the middle of the body by stamping and a large floral motif was made by stamping oval petals on the axis of this circle. Although at first glance the flower gives the impression that it was made by means of a single mold, the carelessness about the placement of the petals reveals that the floral motif was created by stamping the petals one by one. A petal in the upper part of the body was provided in a more slanted state, which is rather interesting. It is understood that the pipe master stamped the petal in a more slanted state in order to prevent the cog-wheel immediately above from being damaged (Fig.6: j). An analogous petal-shaped mold was also used on a white-paste pipe. Nevertheless, the petals did not form any floral motif on this pipe (Fig.4: b).

A motif whose species is not known exactly among the plant decorations is the palm leaf-shaped motif with linearly worked leaves. A decoration was created with equal spaces with this motif in the area bordered by a grooved wheel stamp on the body and the pipe's surface was provided with a lattice appearance (Fig.4: o). An analogous motif is also seen on a pipe found at Damas (François, 2012: 505, Pl.16/15).

Decorations with bird figures were also made on the surfaces of the pipes with the stamping technique (Fig.6: o). Frequently seen with different techniques in the Turkish-Islamic ceramic art, this motif is among the most striking motifs on the pipes among geometric and plant motifs. The bird motif was used as both a decoration and the master's seal on the pipes [8]. Given the bird motifs on contemporary Kütahya and imported porcelain cups as well, it is understood that the bird figures display analogies with each other. These analogies once more reveal the relationship between a cup and a pipe in the same environment. Hence, the presence of analogously-shaped bird figures on both the cup's surface and the pipe's surface indicates harmony and a common decoration repertoire, beyond a coincidence (Uçar, 2019a). Stamped for decorative purposes,

these motifs on the pipes from Kutu Han are analogous, with their appearances, to the bird motifs on the pipes found at many excavation sites such as the Excavation at Smyrna Agora (Ayhan, 2016: 11, Tablo 3), the Excavation at Corinth (Robinson, 1985: Pl. 49, C23), and the Excavation on the Küçükçekmece Lake Basin (Kaya & Özmen, 2017: 357, Res.13).

### 5.2.3 Slip decoration

Even though no glazed pipe is available among the pipes from Kutu Han, pipes with slip decorations are quite abundant. Given their production type, it is understood that the wheel-made pipes rather than the mold-made pipes were slip-painted. In other words, the slip is only the surface color in the mold-made ones but the decoration color in the wheel-made ones. A single type of decoration was made with white slip in the form of diagonal lines on the bodies and necks of the pipes (Fig.7: g,j,m,n,o). Analogues of these pipes are also available among the finds from Smyrna Agora and the Excavation at Ayasuluk (Ayhan, 2015: 49, Res. 5;51, Res. 14). This analogy indicates regional production. This production is shown as the reflection of a tradition from the 14th century to the 18th-19th centuries in Western Anatolia on pipes (Ayhan, 2015: 45).

## 6. CONCLUSION

Pipes, which are among the most frequently used materials in everyday life at every corner of the Ottoman Empire for about 300 years between the 17th century and the first quarter of the 20th century, were discovered abundantly during the excavation at Kutu Han – a city han. The pipes were mold- and wheel-made. A large number of cup and pipe sherds found during the excavation at the han indicate the presence of the coffee house at the han. Furthermore, one of the spaces was used as a coffee house in the 20th century too. While all mold-made pipes out of the red-, white-, and grey-paste pipes are elbow pipes, almost all wheel-made ones out of them are elbowless pipes. As their parallels are given as examples above, analogous pipes were discovered at many points of the Ottoman geography. This proves to us also with archaeological data that Tire was not disconnected from İzmir – an important commercial city and seaport in the 18th and 19th centuries – immediately near it. Given the decorations of these pipes as well, it is understood that they display some integrity with the other pipes in the Ottoman geography.

## ACKNOWLEDGEMENTS

I would like to extend my thanks to Faculty Member Dr. Ertan Daş who allowed me to study the pipe finds from Kutu Han.

## NOTES

1. For further information on the production techniques and origin of the grey ware, see Polat, 2005; Polat, 2008.
2. For information and examples, see Ayhan, 2011a: 71,72; De Vincenz, 2011: Fig.3/27,28.
3. Considering the considerable analogy of the pipes with an elbow with their appearances, this definition was taken from the pipe description in 1792 by L.W. Broughton (cited from Vancouver by Wynia, 2013:26) and the definitions by James L. Murphy and K. Reich. Murphy & Reich, 1974; Murphy, 1980.
4. For the examples, see Daş, 2010: 211, Res.9; Ayhan, 2010a: 19, Res.4.3; Ayhan, 2010b: 55, Res.2; Ayhan, 2015; Taxel, 2008: 40, Fig.1.
5. The cogwheel stamps on the ceramics may be wider than those on the pipes. For some of the examples on the ceramics, see Liaros, 2018:208, Pl.III; Uçar, 2019b: Tablo VI.1-3; Polat, 2019: 104, Tablo 11.
6. For information and examples, see Yılmaz, 2005: 148,150; Koçyiğit, 2014; Uçar, 2016; Ünal & Çağlıtütüncügil, 2016: 204-207; Daş, 2017; Okumuş & Gülbudak, 2018.
7. For further information on this subject, see Uçar, 2019a (in press).
8. An important study about the bird figures on the pipes was carried out by my colleague G. Ayhan. In this study, the bird-shaped pipes with a significant place among pipes were also evaluated in detail, along with the shapes of the bird figures on the pipes. For further information, see Ayhan, 2016.

## REFERENCES

- Avissar, M. (2009). Ottoman Pottery Assemblages from Excavations in Israel. *Reflections Of Empire: Archaeological And Ethnographic Studies On The Pottery Of The Ottoman Levant*, Boston, pp. 7-14.
- Ayhan, G. (2010a). Hasankeyf Kazısı Lüle Buluntularının Değerlendirilmesi. *Sanat Tarihi Dergisi*, 1-22.
- Ayhan, G. (2010b). Başur Höyük Kazısı Lüle Buluntuları. *XIII. Ortaçağ Ve Türk Dönemi Kazıları Ve Sanat Tarihi Araştırmaları Sempozyumu Bildirileri, 14-16 Ekim 2009, İstanbul*, pp. 49-58
- Ayhan, G. (2011a). *Hasankeyf Kazısı Lüle Buluntuları*. Unpublished PhD dissertation, Ege University, İzmir
- Ayhan, G. (2011b). Smyrna Antik Kenti Kazıları 2007-2008 Yılı Lüle Buluntuları. *Sanat Tarihi Dergisi*, 18/2, pp. 1-22.
- Ayhan, G. (2015). Ayasuluk İç Kalesi "Süzgeç Çanaklı" ve "Kaideli Süzgeç Çanaklı" Lüle Buluntuları. *Mustafa Büyükkolancı'ya Armağan*, İstanbul, pp. 41-44.
- Ayhan, G. (2016). Lülelerde Görülen Kuş Figürleri Üzerine Bir Araştırma. *Sanat Tarihi Dergisi*, 24/1, pp. 1-21.
- Bakla, E. (1993). *Tophane Lüleçiliği*. İstanbul.
- Bakla, E. (2007). *Tophane Lüleçiliği Osmanlı'nın Tasarımdaki Yaratıcılığı ve Yaşam Keyfi*. İstanbul.
- Batchvarov, K. N. (2014). Clay Pipes and Smoking Paraphernalia from the Kitten Shipwreck, an Early Nineteenth-Century Black Sea Merchantman. *International Journal of Historical Archaeology*, 18, pp. 1-19.
- Beliaeva, S. (1999). Ochakiv'deki Türk Şehrinde Arkeolojik Araştırmalar. *Uluslararası Dördüncü Türk Kültürü Kongresi Bildirileri, 4-7 Kasım 1997, Ankara*, pp. 109-114.
- Bilavski, G. (2017). Câteva Tipuri De Pipe Din Lut Din Dobrogea Şi Moldova. *Arheologia Moldovei*, XL, pp. 225-240.
- Brusic, Z. (1987). Dio Terata s lade iz 17. stoljeca potonule kod otoka Bisaga u Kornatskom arhipelagu. *Prilpu* 26, pp. 473-490.
- Cengiz, A. (2011). *Edirne Yeni Saray Kazılarında Ele Geçen Lüleler*. Master's thesis, Gazi Üniversitesi, Ankara.
- Daş, E. (2010). Alaşehir Kurşunlu Han Kazısı ve Temizlik Çalışmaları, *XIII. Ortaçağ ve Türk Dönemi Kazıları ve Sanat Tarihi Araştırmaları Sempozyumu (14-16 Ekim 2009) Bildirileri*, İstanbul, pp. 197-212.
- Daş, E. (2017). Agora Kazısında Yeni Bulunan Mezar Taşları Hakkında Gözlemler. *Smyrna/İzmir Kazısı ve Araştırmaları II*, İstanbul, pp. 86-92.
- De Vincenz, A. (2011). Ottoman Clay Tobacco Pipes from Ramla. *Atigot*, pp. 43-53.
- De Vincenz, A. (2016). Chibouk Smoking Pipes: Secrets and Riddles of the Ottoman Past. *Arise, Walk Through The Land Studies in the Archaeology and History of the Land of Israel in Memory of Yizhar Hirschfeld on the Tenth Anniversary of his Demise Jerusalem*, pp. 111-120.
- Erim, N. (2007). Tütünün Ticari Bir Mal Olarak Ortaya Çıkışı: 1600-1900. *Tütün Kitabı* İstanbul, pp. 34-44.

- Ersoy, B. (1994). Osmanlı Şehir-içi Hanları. *Sanat Tarihi Dergisi*, 7, pp. 75-97.
- Ertekin, A. L. (2008). *Tirede Aydın Sancağı İlk Sancak Beyi Halil Yahşi Bey Vakıfları ve Vakfiyesi*, Tire.
- Evely, D. (1988). Clay Tobacco Pipes from the University of Crete Medical Faculty. *The Annual of the British School at Athens*, 83, pp. 135-142.
- Fındık, E. F. (2016). Ay Işığında Tütün Seremonisi - Osmanlı Kırsalında Tütün Kullanımının Kanıtları: Aziz Nikolaos Kilisesi Kazıları Lüle ve Nargile Buluntuları. *Cedrus IV*, pp. 373-392.
- François, V. (2012). Objets du quotidien à Damas à l'époque ottomane. *Dans Bulletin d'études orientales*, LXI, pp. 475-506.
- Gaşpar, A. (2016). Daily customs reflected in the archaeology of Ottoman Timișoara. Notes on the clay pipes. *Materiale Şi Cercetări Arheologice XII*, 259-284.
- Gelichi, S., Sabbionesi, L. (2015). Bere e fumare ai confini dell'Impero Caffè e tabacco in Antibari del periodo Ottomano. *Ca' Foscari, Venezia e i Balcani*, pp. 47-59.
- Goodman, J. (1993). *Tobacco in History: The Cultures of Dependence*. New York.
- Gusar, K. (2008). Archaeological Finds of Clay Tobacco Pipes from the Collection of the Zadar National. *Prilozi Instituta za arheologiju u Zagrebu*, 25, pp. 135-154.
- Hayes, J. (1992). *Excavations at Saraçhane in Istanbul Vol.2*. Washington.
- Humphrey, J. (26 April 1990). The Turkish Clay Smoking Pipes of Mytilene. *Society for Clay Pipe Research, Newsletter*, pp. 2-8.
- İnanan, F., Şahin, D. (2017). Arkeopark- Lüleleri Osmanlı'da Tütün Keyfi. *Uludağ Üniversitesi Fen-Edebiyat Fakültesi Sosyal Bilimler Dergisi*, 18/32, pp. 33-54.
- Iuliana, C. (2013). Pipe De Lut Cu Inscriptii Şi Mărci Din Colectia I.C.E.M. Tulcea. *Peuce XI*, pp. 241-254.
- Kaya, D., Özmen, B. O. (2017). Küçükçekmece Göl Havzası (Bathonea?) Kazıları Osmanlı Lüleleri. *İstanbul Küçükçekmece Göl Havzası Kazıları (Bathonea)*, İstanbul, pp. 343-358.
- Khalil, W. A., Rudolfova, I. (2018). The Collection of Ottoman Tobacco Pipes from Azov Museum-Reserve in Russia. *Journal of the General Union OF Arab Archaeologists* 3, pp. 227-266.
- Koçyiğit, F. (2014). Lale Devri Çeşmelerinin Karakteristik Özellikleri. *Adıyaman Üniversitesi Sosyal Bilimler Enstitüsü Dergisi*, 16, pp. 291-325.
- Liaros, N. (2018). Late Ottoman Tableware From Didymoteicho And Some Notes On Pots' Form, Function And Identity. *XI. Aiecm3 Uluslararası Ortaçağ ve Modern Akdeniz Dünyası Seramik Kongresi Bildirileri*, Ankara, pp. 203-216.
- Milošević, B., Topić, N. (2011). Keramičke lule s lokaliteta Kula Gornji ugao u Dubrovniku. *Starohrvatska prosvjeta III. serija – svezak 38*, pp. 297-328.
- Murphy, J. L., Reich, K. (1974). Nineteenth Century Reed Stem Tobacco Pipes from the Mogadore, Ohio, Dump. *Pennsylvania Archaeologist* 44(4) pp. 52-60.
- Murphy, J. L. (1980). Additional Reed Stem Smoking Pipes From Summit County, Ohio. *The Chesopiean* 18(1-2), pp. 16-31.
- Okumuş, E., Gülbudak, Ö. (2018). Türk Sanatı'nda İnşa Edilen (12.-20. Yüzyıllar) Çeşme Üslupları Üzerine Bir Deneme. *Osmanlı Sanatı'na Dair Denemeler*, İstanbul, pp. 85-122.
- Polat, Y. (2005). Gri Seramik Üretim Teknikleri. *Seres 2005 III. Uluslararası Katılımlı Seramik, Cam, Emaye, Sır ve Boya Semineri*, Eskişehir, pp. 253-266.
- Polat, Y. (2008). M.Ö. 1. Bin Batı Anadolu Gri Tek Renkli Seramiği ve Kökenine Dair Düşünceler. *III.-IV. Ulusal Arkeolojik Araştırmalar Sempozyumu*, Anadolu/Anatolia Ek Dizi No.2, Ankara, pp. 281-294.
- Polat, T. (2019). Marmaray Projesi Kazıları (Yenikapı, Üsküdar, Sirkeci) Osmanlı Dönemi Sırsız Seramikleri. *Sanat Tarihi Dergisi*, XXVIII/1, pp.93-117.
- Robinson, R. C. (1985). Tobacco Pipes of Corinth and of the Athenian Agora. *The Journal of the American School of Classical Studies at Athens*, 54, pp. 149-203.
- Rzepka, S., Hudec, J., Jarmuzek, L., V, D., Hulková, L., Odler, M., . . . Tirpák, J. (2015). From Hyksos Settlers To Ottoman Pipe Smokers. *Tell El-Retaba 2014. Egypt and the Levant*, 25, pp. 97-166.
- Shapiro, A. (2016). Ottoman Clay Tobacco Pipes and Nargile Heads from the Flour Mills in the Ridwan Gardens, 'Akko. *Atiqot*, 87, pp. 97-102.
- Simpson, J. J. (2008). Late Ottoman pipes from Jerusalem. *Excavations by K.M. Kenyon in Jerusalem 1961 – 1967*, 5, pp. 443-446.
- Šiš a-Vivek, M., Filipec, K. (2013-2014). Keramičke Lule S Lokaliteta Zoljani - Čemešac I. *Opusc. Archaeol.* 37/38, pp. 301-333.

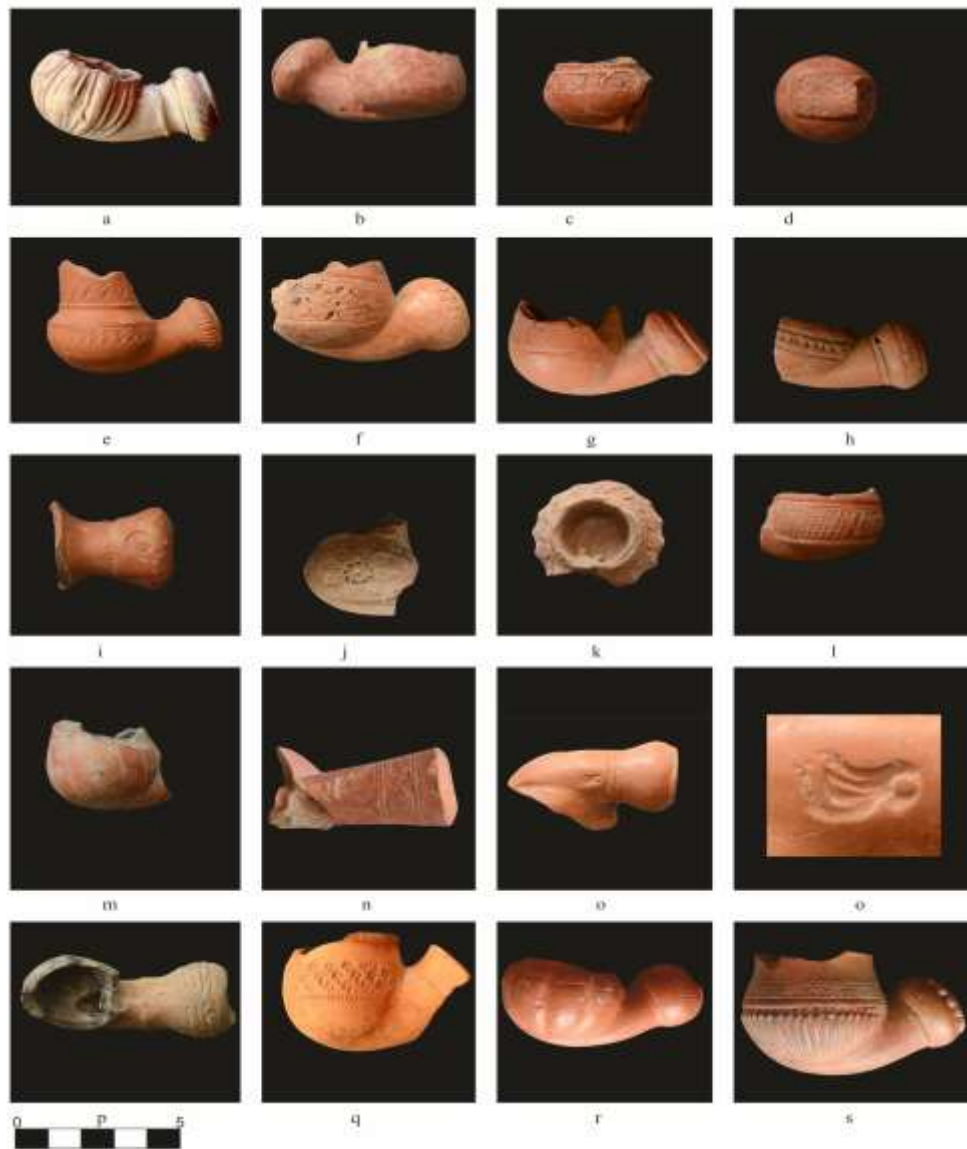
- Tushingam, S, Snyder, C.M, Brownstein,K.J, Damitio, W.J, and Gang D.R. (2018) Biomolecular archaeology reveals ancient origins of indigenous tobacco smoking in North American Plateau PNAS, 115, 46, pp. 11742-11747. doi.org/10.1073/pnas.1813796115
- Tushingam S, et al. (2013) Hunter-gatherer tobacco smoking: Earliest evidence from the Pacific Northwest coast of North America. *J Archaeol Sci*, 40, pp. 1397-1407.
- Tanrıveren, M. F. (2015). *Konya ve Çevresindeki Müzelerde Bulunan Osmanlı Dönemi Tütün Kültürüne Ait Etnografik Objeler*. Master's thesis, Selçuk University, Konya.
- Goodman, J (ed.)(2005) Tobacco in History and Culture An Encyclopedia, I. The United States of America
- Taxel, I. (2008). I. Taxel, "An Uncommon Type Of Smoking Implement From Ottoman Palestine", 39-53. *Palestine Exploration Quarterly*, 140, pp. 39-53.
- Uçar, A. (2016). İzmir Konutlarında Çeşme. *SDÜ Fen Edebiyat Fakültesi Sosyal Bilimler Dergisi*, 38, pp. 251-274.
- Uçar, H. (2019a in press). A Group Of Ottoman Pipe From Mosaic Hall in Smyrna Agora. *Smyrna/İzmir Kazı ve Araştırmaları III*.
- Uçar, H. (2019b). Edirne Yemiş Kapanı Kazısı'ndan Bir Grup Osmanlı Seramiği. *Yaşar Erdemir'e Armağan: Sanat Tarihi Yazıları*, İstanbul, pp. 509-533.
- Uçar, H., Uçar, A. (2018). Tire Kutu Han Kazısı Beylikler ve Osmanlı Dönemi Seramikleri. *Sanat Tarihi Dergisi*, XXVII/1, pp. 1-33.
- Uysal, A.O. (2007). Demirköy Fatih Dökümhanesi Kazısı Seramik Buluntuları. *Byzas* 7, pp.545-558.
- Ünal, R.H., Çağlıtütüncügil, E. (2016). *Urla'nın Tarihi Camileri ve Hazireleri*, İzmir.
- Van Der Lingen, B. (2003). Smoking in the Ottoman Empire and an Introduction to the Clay Tobacco Pipes from the Beirut Souks Excavations. *Berytus* 47, pp. 129-142.
- Ward, C., Baram,U. (2006). Global Markets, Local Practice: Ottoman-Period Clay Pipes and Smoking Paraphernalia from the Red Sea Shipwreck at Sadana Island, Egypt. *International Journal of Historical Archaeology*, 10, 135-158
- Wynia, K. A. (2013). *The Spatial Distribution of Tobacco Pipe Fragments at the Hudson's Bay Company Fort Vancouver Village Site: Smoking as a Shared and Social Practice*. Master's thesis, Portland State University.
- Wood, J. (1998). Pipes from Malta: a short account of the tobacco pipes found in Dockyard Creek, Birgu. *The International Journal of Nautical Archaeology* 27/4, pp. 313-330.
- Yener, A. (2005). Tütün Lüleleri ve Antalya Kale-İçi'nde Bulunan Örnekler. *Arkeoloji ve Sanat*, 119, pp. 94-113.
- Yılmaz, F. (2007). Tütün Üzerine Düşünceler: Batıda ve Bizde. *Tütün Kitabı*, İstanbul, pp. 4-15.
- Yılmaz, S. (2005). *Osmanlı Mimarisi'nde İstiridye Formu*. Unpublished PhD dissertation, Marmara University, İstanbul.
- Zejnildodžić, E. (2012). Lule iz Novovjekovne Zbirke Arheološkog Muzeja Istre. *Histria Archaeol.*, 43, pp.163-191.



Figure 4. Elbow pipes. White-paste pipes (a-g); grey-paste pipes (h-o); red-paste pipes (p-t)



Figure 5. Elbow type, red-paste pipes.



*Figure 6. Elbow type, red-paste pipes.*



*Figure 7. Elbow type pipes (a-h); elbowless pipes (g-p).*