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New Insights on the Sealing Practices in Early Bronze Age Anatolia: A Case Study from Küllüoba, Eskişehir

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ABSTRACT
This paper presents a detailed examination of a cretula found in situ during the excavations at Küllüoba, situated in the westernmost part of Central Anatolia. A series of at least three sealings were impressed side by side on this piece of clay that covered the mouth of a bottle or a narrow-necked jar. The same seal, which created these sealings at the rim of the vessel, was also used to roll impressions on the bottom part of the cretula. The find, which is a first in Küllüoba, where excavations have been carried out for many years, is compared with the few examples found in Anatolia. Their similarities and differences are discussed in this paper. Although various types of stamp seals unique to Anatolia have been unearthed in many settlements where the Early Bronze Age (EBA) is well represented, the functions of sealings are scarce. The abovementioned cretula found in Küllüoba will play a part in re-examining the function of stamp seals that have no associated sealings discovered so far and in understanding the mechanisms of commerce and economics emerging in Anatolia during the Early Bronze Age.
Keywords: Early Bronze Age, Cretula, Sealing, Küllüoba

Introduction

The 3rd millennium BCE was a time of transformation that provides significant data on Anatolia's complex social structure and organized relationship networks. At this point in time, planned city settlements, defensive systems, impressive structures and finds, as well as class changes, are observed. The groundwork of the commercial order and the state system begins to appear but actually emerges in the next millennium as it is well known from the Assyrian trade colonies period and the Hittite Empire. Seals are associated with the emergence of control mechanisms in Southwest Asia. The earliest sealings in this context belong to the Halafian Culture, which stands out with its unique architecture and pottery traditions that spread widely, especially in Northern Mesopotamia. The earliest seal examples, roughly dated from 6300 BCE to the beginning of the Halafian period (Late Neolithic), were found at the settlement of Tell Sabi Abyad in Northern Syria (Duistermaat, 1996). Many seals and sealings were recovered from a burnt storage unit in the settlement. In this area, the sealings found were mostly impressed on vessels, basketry and pottery rather than doors (Duistermaat, 1996; Akkermans and Duistermaat, 1996).

Seals are chief indicators showing whether the stored goods were protected against theft and served as marks of a person's or group's ownership of their products. They are defined as objects made of stone, faience, bone, metal, glass, or wood and have surfaces carved with designs (Collon, 1990).

Stamp seals began to be used in Anatolia during the Neolithic period, particularly considering examples from Çatalhöyük (Türkcan, 2006) (7th millennium BCE). They continued to be employed throughout the ages, but their forms and intended purposes changed. Various researchers have suggested that in addition to serving as a control mechanism, seals may have also functioned as amulets, textile stamps, or objects bearing preliterate symbols (Atakuman, 2015; Çilingiroglu, 2009; Türkcan, 2006; Umurtak, 2009). Seals' use as a part of a control mechanism associated with production and consumption occurred during the Early Bronze Age (EBA) (Massa and Tuna, 2019).

A cretula can be defined both as a guarantee of the security of the sealed goods and as a document proving that an administrative procedure has been carried out. Cretulae, which were kept for recording purposes, were placed in temporary storage areas, also known as silos, and usually in large quantities after being removed from the containers in which they were sealed. This happened as a result of the recording and counting process (Fiandra & Frangipane, 2007).

The cretula is applied to protect the goods carried in the containers and to prove whether there was any tampering with the goods before they arrived at the destination. Containers

secured with cretulae may have been moved within the same settlement, from one warehouse or artisan workshop to another, or even from one sector to another within the same building, such as a public building. If the transported goods were sealed, the identification documents may not have functioned as administrative documents, as they were not required to form part of the registration and accounting system for the internal management of the goods (Fiandra & Frangipane, 2007).

Cretulae attached to a peg with string wrapped around the peg are generally identified as door sealings. A room or door sealing prevents unauthorised access or allows it to be detected, by documenting the identity of people accessing a certain area, unlike container sealing. According to the identification based on Arslantepe cretula samples, at least two types of door sealings have been identified (Fiandra & Frangipane, 2007).

In this study, the cretula discovered in the burnt section of a structure in Grid AG 22 located in the south-eastern part of the mound called the lower town, dated to the EBA II, was discovered during the 2021 season of the Küllüoba excavations. Excavations at Küllüoba have been ongoing since 1996 in the Seyitgazi District of Eskişehir. The socioeconomic structure and use of seals during this period will be evaluated based on this find. Although seals have served various purposes in Anatolia since the Neolithic period, they are now considered to be a part of the economic system since the beginning of the EBA. This study aims to examine in detail one of the few identifiable examples of at least some stamps being used for real sealing purposes. In this context, the seal is discussed in terms of being earlier than later examples known in the context of relations between distant regions and showing that some control mechanisms may have been active since the EBA II.

Küllüoba

The Küllüoba settlement is situated to the west of the Upper Sakarya basin, on a natural route that extends from the north to the south of Central Anatolia, and on a main route that connects the region to the Inner Aegean and Marmara regions (Figure 1).

According to recent research, the settlement has a long sequence of stratigraphy in which all three phases of the EBA are represented (Türkteki et al., 2021) and more specifically have demonstrated that the mound was inhabited from 3200 to 1950 BCE. During the Küllüoba excavations, a circular layout of approximately 50 m in diameter with adjoining houses all opening onto a central courtyard, dating to the beginning of the EBA, was revealed (Efe, 2003; Efe and Ay-Efe, 2007; Efe and Türkteki, 2011) (Figure 2). During the EBA II, there was an upper town with adjoining trapezoidal megarons and monumental public structures surrounded by a fortification wall. The upper town stands out in the settlement that spreads across a wide area in harmony with the topography of the mound (Efe and Fidan, 2008). During this period, a lower town generally consisting of relatively simple rectangular

structures, with single rooms appears (Figure 2). Due to a fire in this section of the site, it is better preserved and it enables the finds to be easily identified in terms of context (Efe, 2009). The cretula, the subject of this paper, was also discovered in the abovementioned lower town (Figure 3).

The total number of stamps and seals recovered to date from Küllüoba is relatively low (S. Ü. Türkteki, 2020). The most plausible reason for this is an insufficient amount of the structures' interior contexts have been excavated. In recent excavations of the cemetery area, two seals were discovered that were used as amulets (Türkteki, n.d.).

The Cretula

Made from a 4.5 cm x 2.6 cm piece of clay, the cretula (Figure 4) probably rested on the cover of a narrow-necked jar or the shoulder of a bottle (Figure 4D, Figure 5D, Figure 6). During previous excavation seasons at Küllüoba, bottle-shaped vessels from the EBA II were unearthed (Efe, 2014). Since the area in which the cretula was found suffered a fire, two-thirds of the cretula survives today. The same seal made three impressions on the piece of clay (Figure 4A). Of the three impressions, two are intact (Figure 5A2-A3), while the third is partially preserved (Figure 5A1) because it is situated on the side of the cretula. Above the three impressions are additional thin groove-like impressions that were made by rolling the same seal horizontally (Figure 4B, Figure 5E, 5B). The other impressions were either carved on the sides or made by a cylinder stamp. Considering that the impressed surface is very small, approximately 1.1 cm in diameter and the stamping surfaces of stamp seals are comparably larger, it is more likely that the seal used here is a cylinder-stamp seal. An example of a stamp-cylinder seal that creates similar negatives is from Troy (Schliemann, 1881, no 499-500) and the EBA layers of Zincirli (Luschan, 1943:Taf.39/e). It is thought that the stamp-cylinder seals originated in the northern Levant and spread from there. Few examples were found in Troy and the Aegean (Aruz, 2008)(Massa, 2016). Accordingly, the example in Küllüoba may indicate connections with the region in question.

When the negative of the seal on the cretula is examined, the presence of a plus or cross-shaped motif inside a circle is observed at the centre of the area that measures 1.1 cm. The outer edge of the seal is decorated all around with indentations, leaving deep grooves when impressed. At least two rows of small squares in a straight line were created by rotating the outer edge of the seal on its horizontal axis (Figure 4B, Figure 5E, 5B). Such application is also seen in an example from Demircihüyük (Baykal-Seeher and Obladen-Kauder, 1996, 286, fig.136.5). By applying these designs, the clay composing this section of the cretula was thinned, making it more susceptible to breaks while opening the vessel. As observed here, the cretula in question broke in this section for this reason. The sharp edges on the stamping surface indicate the seal was made of metal or stone. Although very few metal seals are

known from contemporary sites in and around Anatolia (Oğuzhanoğlu, 2019; Pullen, 1994; Umurtak, 2002), no cylinder stamp made from metal has been found so far. For this reason, it is not possible for the seal of the cretula to be metal.

On the other side of the cretula is a negative mark indicating it was probably placed on top of a rope (Figure 4C). As identified in Arslantepe, the cretulae all bear a seal impression on the obverse, while the reverse bears the impression of the part of the sealed object in physical contact with the clay (Fiandra & Frangipane, 2007). Additionally, some irregular marks suggest the clay was roughly worked (Figure 5C, 5F, 5G). These negatives also show the process during the sealing process which was described in detail by Fiandra & Frangipane: "*The closures of vases, sacks, and doors using pegs, were always performed by winding string, rope or ribbon around them, but never knotting precisely to make them easier to open again. The openings of vases, when they had not been covered with the straw or wicker lid, were covered with a piece of leather or cloth of various types. These coverings were held in place by ligaments wound but not tied around the neck. The ends of the ties were crossed or simply placed together and kept in place by the cretula*" (Fiandra & Frangipane, 2007).

As observed from the surface of the cretula, the stamping area is considerably small. Many seal examples bear "plus" or "cross" motifs. A close example of the plus or cross motif inside of a circle is also seen on a stamp seal found in Bademağacı. However, the motif does not conform to the general composition of the Bademağacı stamp seal (Umurtak, 2009, fig:6). Another cretula was found in Karataş-Semayük (Mellink, 1972, fig.5). The same motif is observed on a spindle whorl also found in Karataş-Semayük (Mellink, 1967, fig.57).

Context and Dating

Just south of the southeast entrance that served as the subsidiary gates of the EBA II upper town of Küllüoba, adjoining structures with their backs to the fortification wall were discovered in the southeast section of the settlement, (Efe and Türkteki, 2011; Türkteki et al., 2021). All five structures found here suffered a fire. Inside these single-room structures, architectural elements, such as hearths or ovens, grinding stones and a significant number of pottery pieces employed in daily activities were unearthed *in situ*. Unlike other buildings, the structure located among Grid AF-AG 22 has a large silo divided into two and a L-shaped corridor. Situated against the structure's western wall, this silo is divided into two by a mudbrick wall in the middle. The northern area measures 1.2 m x 2.3 m in width and length, respectively, and 1.15 m in depth, while the southern part measures 2.2 m x 2.4 m in width and 1.25 m in depth. The flat stones on the floor of both silos must have been used to fix wooden covers with the help of poles. Within these silos, period-specific pottery, such as beak-spouted pitchers and Demircihüyük bottles were found. The larger silo has a capacity of 6.6 m^3, while the smaller one has a capacity of 3.17 m^3. On the floor level of the structure,

comparably larger earthenware jars were discovered. In the next building phase, a wall was built to completely block the entrance to this corridor.

A silo or storage area was found in the northeast corner of the abovementioned L-shaped corridor. It was dug into the room's floor and completely plastered, with only a small opening left at the mouth. In the southeast corner of this structure with a south-facing entrance, a small vacant space of 1 m x 70 cm was formed by two flat stones facing each other. The sides of this small space were plastered and bear traces of a fierce fire. The cretula, the subject of this paper, was found in this space at a level of 929.46 m. In addition to the cretula found in this space, according to the botanical analysis, 11 grain fragments of wheat/barley (*Triticum/ Hordeum*) were also recovered. These 11 fragments of wheat/barely constitute the cereal group with the highest number of grains. As for pulses, only 2 lentil (*Lens culinaris*) seeds were found. Wild plants are very rare; only 5 wild wheat (*Poaceae*) seeds and 1 cleaver (*Galium*) seed were found.

When considered in its entirety, the structure, with its various types and sizes of silos, must have served as storage for the structures situated to its east or west. The small area where the cretula was found in the structure could also be considered a space where various products were stored in small vessels.

The pottery found in and around the deposit, where the cretula was found, and the radiocarbon results obtained from the structure's floor in the east played a significant role in dating the cretula. An animal bone, no. 373/1, was discovered in an oven at a level of 929.42m just east of the area where the cretula was found and was sampled for radiocarbon dating. The results yielded the uncalibrated date of 4085+/-26, and 1 sigma calibrated date range of 2699-2568 BCE. The median calibrated age obtained from the abovementioned radiocarbon test is 2627 BCE. Thus, the analysis suggests that the cretula is dated to the IVC-IVD layers, in other words, the middle of the EBA II period of Küllüoba.

Sealings from the Anatolian Peninsula

Although stamping was an old tradition practiced in Anatolia for ages, the practice of using stamps as tools of administration began in Mesopotamia and spread to Anatolia. This practice began in the Halafian period but was popularised during the Late Uruk period. It reached Anatolia via the Upper Euphrates and Cilicia, as shown by the Arslantepe sealings (Pitman, H., Frangipane, 2007) and the Tarsus seals and sealings (Goldman, 1956) (Palumbi, 2010). Although many excavations in the western part of the Anatolian peninsula have investigated the EBA, so far very few sealings have been found. Undoubtedly, the key reason for this is that without exposure to heat, the sealings cannot be preserved to survive to the present day. However, most excavations investigating the EBA in Anatolia were completed before modern archaeological techniques and soil screening was not done carefully. Yet,

the EBA-focused projects at Kültepe in recent years (Kulakoğlu and Öztürk, 2015; Öztürk, 2019) and the examples discovered during the Resuloğlu excavations (Ünar, 2020) indicate that this artefact type might not be scarce at all (Massa and Tuna, 2019).

Particularly, the examples found in the palace complex at Arslantepe are highly informative regarding the usage of sealings. Various types of sealings were used for sealing doors, sacks and baskets as well as registry tools were found in this complex (Fiandra and Frangipane, 2007). Unlike the sealings from Arslantepe that date to the end of the 4th millennium BCE, the earliest examples from the Anatolian peninsula include sealings from Alacahöyük, (Koşay, 1951:pl.108), Alişar (von der Osten, 1937:fig. 87), Demircihüyük (Baykal-Seeher and Obladen-Kauder, 1996:fig.136.5), and an example inside a multi-roomed structure at Bademağacı (G. Umurtak, 2010) dated to the beginning of the EBA II. All of these examples date to the beginning of the EBA II. A parallel example of these sealings is also known from Lemnos (Cultraro and Dova, 2004). Among these, the Demircihüyük example, due to the marks it bears from a stamp-cylinder seal, can be considered one of the earliest examples of commerce between distant regions (Baykal Seeher and Obladen Kauder, 1996). The closest parallel for the Küllüoba cretula is the Demircihüyük cretula. The Demircihüyük cretula has the same decorations on the "stamp" side and the "cylinder" side, and it is attached to a bulla, which is clearly not local to central Anatolia but likely comes from Upper Mesopotamia/ northern Levant. So, both Küllüoba and Demircihüyük, two sites very close to each other and contemporary, would have received containers sealed with cretulae originating from Syria, approximately at the same time.

Other examples are mostly dated to the end of the 3rd millennium BCE. These include examples from Resuloğlu (Ünar, 2020), Kültepe (Kulakoğlu and Öztürk, 2015; Öztürk, 2019), Kilisetepe (Collon, 2007), and examples out of context from Troy (Schmidt, 1902) and Boz Höyük (Massa and Tuna, 2019). The Resuloğlu examples (Ünar, 2020) are similar in terms of context to the Küllüoba example because they are also associated with silos and storage areas. In recent years, the examples found in layers 12 and 11b of Kültepe were classified as stoppers and labels (Öztürk, 2019). They are significant because they provide evidence of contact with distant regions and are associated with monumental/administrative structures.

Socio-Economic Structure and the Use of Seals in the Early Bronze Age

Compared to the surrounding regions, the Anatolian peninsula was forced to create a different economic model due to its narrow plains divided by mountains and limited irrigation systems. As a natural result of the geographical conditions, from the Neolithic period until the end of the 4th millennium BCE, low-input agricultural production was practised in the Anatolian peninsula. However, at the beginning of the 3rd millennium BCE, possibly due

to the movement of people into Anatolia, there was rapid population growth and change in land-use strategies (Özdoğan, 2022) (Maltas et al. 2022). At the same time, there was also a significant increase in the number of settlements. From the beginning of the period, defensive systems, monumental public buildings, and centres with economic and political control on a regional scale began to appear. Settlements, such as in Poliochni (Bernabò Brea, 1976), Troy (Blegen et al., 1950), Limantepe (Erkanal and Şahoğlu, 2016), and Hacılar Büyük Höyük (G. Umurtak and Duru, 2014), demonstrate that these centres had strong defensive systems and grand monumental architecture since the beginning of the EBA. When social complexity emerged in the early stages of this period, the economies of these centres still primarily depended on agricultural production. From narrow plains to wide plateaus, these geographically bounded areas constitute the political and cultural areas of the EBA communities (Sarı, 2011, 2012) (Efe, 2004). Therefore, organising the storage and security of the agricultural products grown within the area of their jurisdiction was done at these centres (Bachhuber, 2015). Despite the differences in settlement sizes and characteristics, all EBA I and II settlements had storage spaces associated with intense agricultural activities. The discovery of the central storage areas in Poliochni (Bernabò Brea, 1976; Kouka, 2002) and Demircihüyük (Korfmann, 1983) and the discovery of the structures with large storage areas in the settlements of Küllüoba (Efe and Fidan, 2008), Resuloğlu (Ünar, 2020) and Bademağacı (Umurtak, 2009) demonstrate the economic importance of agricultural products in most of the settlements during the EBA I and II. During this period, textile production became an industry (Özdoğan, 2022). However, it originally began as part of the Secondary Products Revolution (Sherratt, 1981) and continued intensively since the 4thmillennium BCE (Arbuckle, 2012). According to the zooarchaeological analyses that were completed at Küllüoba and Demircihüyük, sheep wool was preferred over sheep hair for wool production from the second half of the EBA onwards (Gündem, 2012) (Rauh, 1981). Although very few structures so far have been distinctly identified as workshops in EBA settlements, it would not be accurate to interpret all structures as houses (Bachhuber, 2015). For instance, all the structures in Demircihüyük are believed to have the same interior architectural layout (Korfmann, 1983). Although loom weights and the other products associated with textile production were found inside the structures indicating that production took place mainly in domestic homes, since no benches or platforms were found inside, it is suggested that these structures served as living spaces. However, excavations at Seyitömer Höyük demonstrated some spaces were used for pottery production and some as workshops for textile production (N. Ünan and Ünan, 2022). Therefore, it can be deduced, from the middle of the EBA onwards, that workshops for some crafts began to separate from domestic spaces.

In the middle of the 4th millennium BCE, it is thought that mining developed in the Anatolian peninsula CE and gradually became a systematic industry (Yener, 2021). As a result of this industry's development alongside social hierarchy, settlement plans changed

(Dedeoğlu, 2014). Mining settlements (Yener, 2021), (Yalçın et al., 2015), castles and agricultural centres located on plains also point to a specific settlement hierarchy. In the first half of the 3rd millennium BCE, interregional connections with distant regions, although limited, began. These initial connections can be seen between the Levant and the Aegean coastal region (Massa and Palmisano, 2018).

Parallel with all these socioeconomic developments, under the influence of Mesopotamia, the practice of sealing extended its traditional uses to the securing of products. At the end of the 3rd millennium BCE, the "elite class," which is the leading force behind these changes, emerged (Kouka, 2009; Massa and Fidan, 2017; Zimmermann, 2009, 2016). At this stage, organised trade relations based on exchanging raw materials, primarily metals, between distant regions were established (Efe, 2020; Massa and Palmisano, 2018; Şahoğlu, 2005). The seals provided both the control of the products sent to different regions and the registration of the shipment of these products. Thus, it also helped to keep the accounting of these products (Frangipane, 2012). In this context, a control mechanism was established in which seals were used before written records in tablet form due to the new economic and administrative structure.

Stamps, which date back to the Neolithic period in the Anatolian peninsula, also remained in use in the EBA. While many examples of stamp seals have been discovered so far, very few sealings that these stamp seals created have been found (Massa and Tuna, 2019). Pluses, crosses and nested chevrons are the most common motifs on stamp seals (Dede, 2014). Lattice, lozenge and spiral motifs are also observed. Problematically, the motifs on the discovered stamp seals do not match those on the sealings. Based on this, some researchers suggest that most objects considered to be seals, especially those with complex motifs, could actually have been used for decorative purposes (Massa and Tuna, 2019) (Rahmstorf, 2016). However, especially the seals and sealings recovered from Kültepe prove that many stamp seals, even those bearing complex motifs, were impressed on clay sealings (Kulakoğlu and Öztürk, 2015; Öztürk, 2019). The sealings found in Kültepe are clear evidence that the stamps whose sealings could not be found in many contemporary settlements were also used as seals. According to some researchers, these motifs could be symbols that had common meanings for preliterate societies (G. Umurtak, 2013).

Although there have been few examples unearthed from the Anatolian peninsula, all of this data and the sealing examples should be considered as strong evidence that stamp seals were used for security purposes since the beginning of the 3rd millennium BCE. In this context, the Küllüoba example is clear evidence. During the excavations, no such cretula has been discovered in any pithoi or large storage area (Efe and Fidan, 2008), such as complex I and complex II dated to EBA II. On the other hand, some data shows that special products were kept inside some structures, which later suffered a fire in the lower town of smaller,

single-room structures (Çizer, 2015). Some data on a pot of *erysimum crassipes* seeds, which is possibly a product for medical use, found inside a burnt structure next to the one where the cretula was discovered, was published in previous years (Çizer, 2012). In this context, it is likely that besides the ones stored in large vessels, various other products, perhaps as seeds saved for planting, were stored in smaller containers inside the abovementioned structures. It is possible that stamping was used only on such special products. The same argument was also made for the sealings recovered from the storage areas in Resuloğlu (Ünar, 2020).

Conclusions

Contrary to its surrounding regions, the small number of available examples of cretulae suggests that the use of seals was less common in Anatolia (Massa and Tuna, 2019). Since geochemical analysis of the clay used in Küllüoba has not yet been done, it is not possible to say whether the piece of clay used in making the cretula was locally or non-locally sourced. Accordingly, it is probable that the product kept inside the vessel was of high economic value and the cretula was used to ensure that the product inside was secure during its transport. Based on the negatives on the cretula, a cylinder-stamp seal must have made the impressions. The origins of stamp cylinders are from the northern Levant. This early example of a cretula found in Küllüoba points to the sealing practices in Anatolia which, as a result, emerged under Levantine influence.

When the EBA examples recovered from the Anatolian peninsula are considered, the sealings from Arslantepe stand out because they point to the practice of sealing doors and large vessels, unlike the other examples from Anatolia. Considering the other unearthed examples, all sealings must have been used on small vessels, mostly bottles or jars. Therefore, it is possible that the products inside these vessels differed from the other daily consumed agricultural products and comparably had a higher economic value (such as a different kind of seed, etc.).

There is also no data indicating that the sealings discovered in the Anatolian EBA were recorded and archived. The reason behind this is the differing economic structures between Mesopotamia, the Levant, and Anatolia (Özdoğan, 2011; Wengrow, 2011, Frangipane, 2010). In central and western Anatolia, luxury goods and metals, which also symbolise power, became more prominent among political and economic choices during the emergence of the elite. The survival of this elite class depends on the trade of raw metal and the protection of the routes where this trade takes place (Efe, 2002). However, the management of the basic staple economy seems to be given less importance by this ruling elite (Frangipane, 2012).

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Figure 1: Sites mentioned in text.

Figure 2: Küllüoba Settlement plan.

Figure 3: Photo showing the context of the cretula

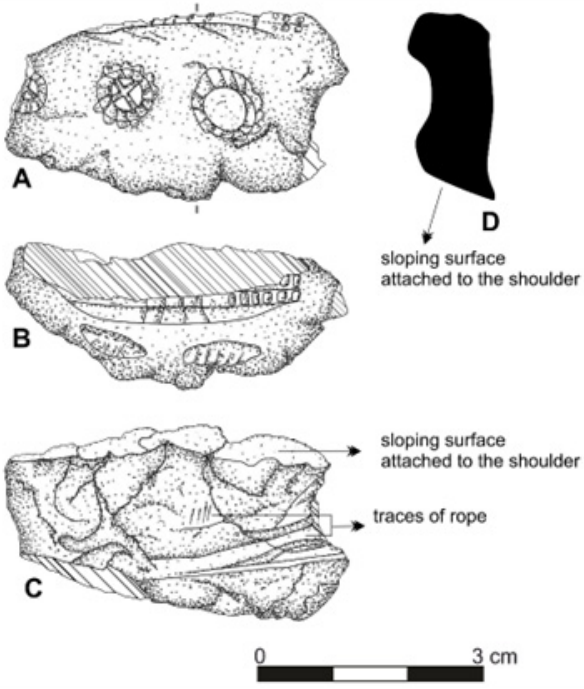

Figure 4: Drawing of the cretula

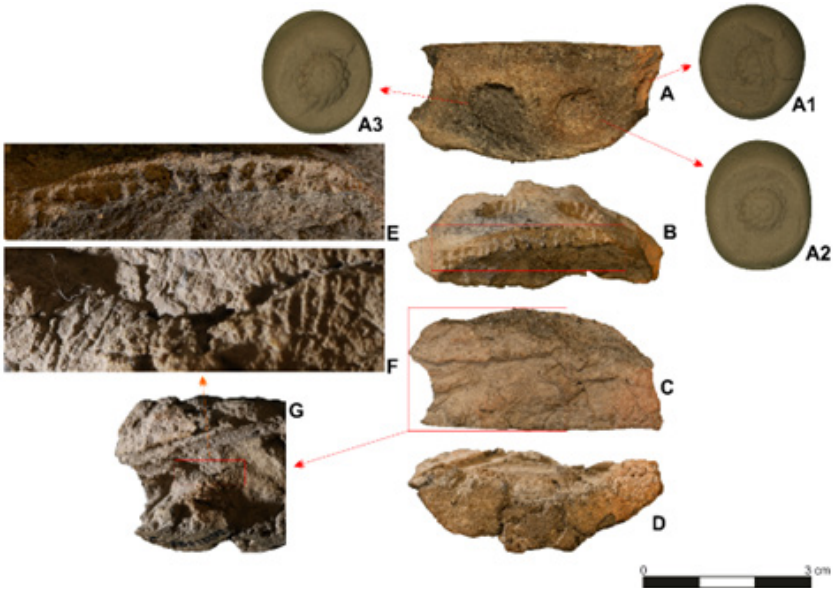

Figure 5: Photo of the cretula and negative of the sealing

Figure 6: Reconstruction proposal regarding cretula posture