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# ONE-HOLED STONE ANCHORS FROM THE COAST OF ANTALYA/TURKEY-2011

HAKAN ONIZ\*

## INTRODUCTION

ANCHORS strongly enlighten the history of seamanship because they are a pivotal necessity of ships and also the most frequently detected pieces of underwater archeological researches. All water vessels need anchors when they are required to stand still on the surface. Anchors are divided into three main groups according to the materials used in their production, comprising of stone, wood and iron. These main groups are supported by other kinds of materials and have gained different forms with the introduction of different technologies, in turn creating subgroups of anchors. Both in the past and the present, the most easily obtained and manufactured anchors have been stone anchors. The boats in the early primitive period of vessels used stone anchors due to the abundance of stone and the ease of manufacture. Therefore, stone anchors were the most commonly used anchor type throughout naval history. Not only from the Mediterranean coasts, but also from the Atlantic Ocean (Markey, 1997: 127), to the Indian Ocean (Rao, 1965: 30), and from the Red Sea (Raban, 2000: 268), to the Black Sea (Zelenko, 2008: 74; Porozanov, 1989: 349) it is well known that the stone anchor has not been used only in seas but also in lakes (Tripathi and Patnaik 2008: 386) and rivers for a considerable length of time. This basic manufacturing process has been used probably in all the seas around the world in different periods. Stone anchors are divided into three main groups within themselves; Anchor stones, single holed stone anchors and multi holed composite stone anchors (Kapitaen, G., 1983: 34).

There is no doubt that the single holed anchors are widely explored during the underwater excavations and researches, especially in the Mediterranean. More than a hundred single holed anchors were found on the Israeli, Athlit, Apollonia, Kfar Samir, Kfar Galim, Neve-Yam, Megadim, Dor, Arsuf and Karmel coasts (FIG. 1). These anchors, which are mostly found in a depth of 1 to 10 meters and 30-300 meters away from the coast, are predominantly in the form of the Byblos, Syria, and Egypt single holed anchor type (Galili *et alii*, 1994: 93). One example of single holed stone anchor was found near the Antalya Gelidonya wreck dated to ca.1200 BC. This anchor is 219 kg and is thought to be thrown off a boat during a maneuver while trying to escape (Pulak and Rogers, 1995: web). Between the years 2000 and 2002, during the studies performed along the coast of Antalya done on behalf of Antalya museum and during the researches performed along the Antalya-Gazipaşa coasts with Nicolas Rauh and Cheryl Ward, numerous amounts of single holed stone anchors were found (Ward, C., 2005: web). In 2005, a team including Uwe Mueller also found a large amount of stone anchors during the survey of the Karpaz Peninsula-Galinaporni village coast at

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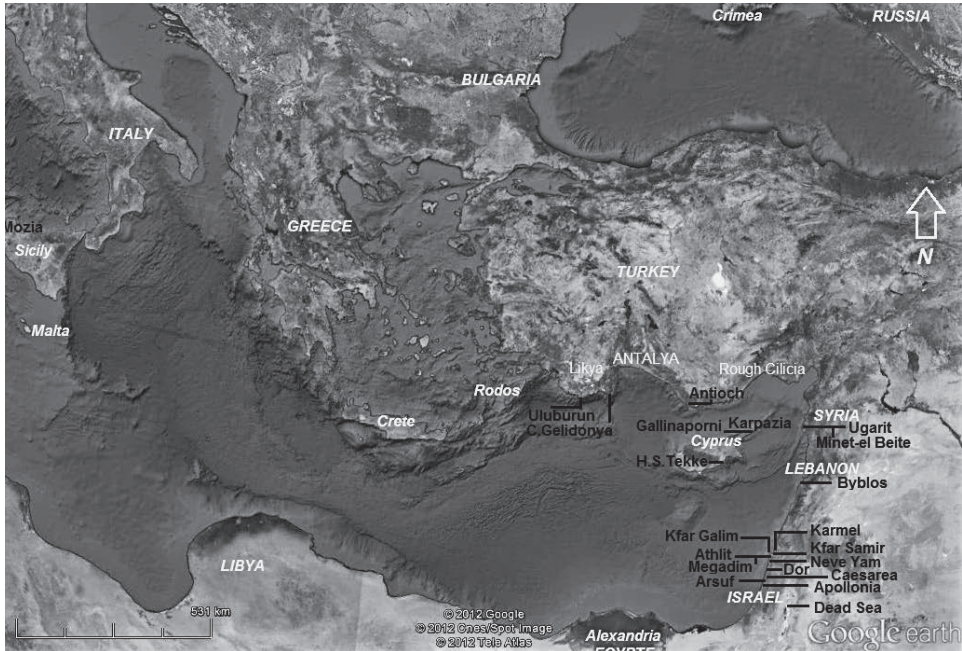


FIG. 1. Locations at Mediterranean which are mentioned in the text.

the south west of Karpaz in Cyprus (Oniz and Zafer, 2007: 6-77). In the years 1969-70, research was done at south-east and north-east Karpaz peninsula. During the underwater researches of Oxford Archeological Research Laboratory, 140 stone anchors were found. These anchors have an extreme resemblance with the anchors that were found on the Antalya coasts. Approximately 25 of the anchors from Cyprus are quite smaller in size than the anchors found in Antalya. These small pierced stones are described as anchors for fishing or sponge diver boats (Green, 1971: 170, 171), but it is preferred to categorize this size of pierced stones as fish net sinkers (weights). There is no doubt that a small boat can land at a port at calm weather conditions with a 3 kg. anchor attached to it; but this weight is not enough to keep the boat on the surface in bad weather conditions. This does not mean that one-pierced stones heavier than 1 or 2 kg. cannot be used as anchors.<sup>1</sup> However, if they are found in an appropriate fishing area, this increases the probability of the anchors being used as net sinkers.

The first studies on stone anchors were done by Honor Frost, followed by Avner Raban and scientists like Ehud Galili who have transmitted the issue to present day in a clear way.<sup>2</sup> Gerhard Kapitaen has a study based on technology and categorization

<sup>1</sup> If the boat is small, such as 3 or 4 meters long, using a light one-holed stone anchor weighing 2 or 3 kg is possible only during calm weather and calm sea conditions. Otherwise it cannot stay safely on the surface.

<sup>2</sup> Honor Frost is a great figure in the study of the stone anchors of the Mediterranean. Field recording, using styles, periods and "nationalities" of stone anchors widely took place in her published works (Frost, 1985: 97-113). Avner Raban published articles on stone anchors, typically from

that has been used as a reference point for years (Kapitaen, G., 1983: 34). With the contribution of valuable scientists, a part of the stone anchors in the Mediterranean are dated and localized. On the other hand, in the recent researches, new forms of anchors have been discovered. Due to the increase in underwater researches, the localization of the anchors has become a subject of debate. Revision is necessary in this field of dating, categorization and localization. For example some single holed stone anchors are still used in some regions even today because the material is easy to obtain. Some fishermen in Antalya, Kemer and Gazipaşa are still using stone net sinkers. Therefore, there is no valid reason to deny the continuity in stone anchor tradition since before the Bronze Age.

#### LOCALIZATION AND DATING OF THE ANCHORS

The localization and dating of the anchors is usually done according to several different procedures. The first one is defining the visual characteristics of the forms, based on the type of the stone, the general look of the anchor, and the size of the holes. The other procedure was formulated with the contribution of the scientists mentioned above. This procedure entails transferring the sizes of the anchors to the charts, after which the results are reached by comparing them with the other dated/ categorized examples (Frost, 1985: 113; Galili *et alii*, 1994: 97). The same process is applied in this study<sup>1</sup> (FIG. 2 and TABLE 1). It is known that the seaman's cultural and traditional interactions are quickly projected to the material culture. Through these and other variables, we cannot get certain results but it is believed that we can draw approximate conclusions. During the localization studies, petrography tests are used. For example, the petrography tests applied to 150 stone anchors found in Bulgarian coasts showed that 90% of them are of local stones (Porozanov, 1989: 349). The studies at the bottom of these ports, especially dating due to the layers of the deep, do not give certain results. Dragging anchor might destroy the bottom of the sea in windy and wavy conditions. Therefore, the layers at the bottom of the harbors, which contain archeological materials, may jumble. In this case, it is very hard to date the anchors based on the depositional sequence. Avner Raban has also mentioned the problems in dating the three holed stone anchors. According to Raban, none of the three holed stone anchors found in the Israeli coasts up to the year 2000 was found in securely datable context (Raban, 2000: 265). The same problems pertain to the single holed anchors too.

the coast of Israel, and indicated that "*anchors are profuse survivors of maritime activity through the human history. They cannot be regarded as the 'potsherds of marine archaeology and their typological study is yet come of the age.'*" He also stresses the importance of continuing to collect and publish data and indicate more attention to context than to metrological data (Raban, 2000: 265). Ehud Galili, with colleagues Jacop Sharvit, Baruch Rosen and Michal Artzy, has already published many articles on stone anchors. His fruitful contributions to the field are published almost every year.

Their publications have clarified Bronze Age stone anchor classifications as well as the trade between Byblian, Egyptian, Aegean, and Assyrian merchants during the Second Millennium BC. (GALILI *et alii*, 1994: 106; GALILI *et alii*, 1993: 62).

<sup>1</sup> Petrography or other tests could not applied on the anchors; because this project is an underwater research project and researchers have no permission to change their in-situ positions.



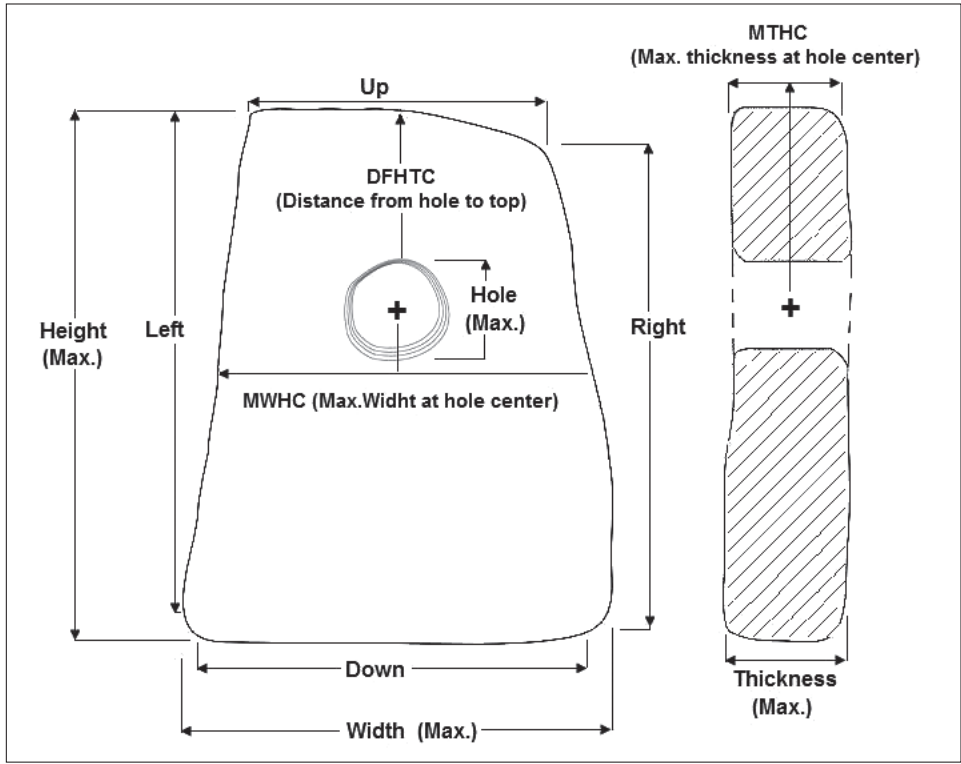


FIG. 2. Key to the measurements.

Ships may stand still with their anchors cast in the harbor, in the anchorages, or at any sandbanks/reefs deposited the open sea. If the sudden storms affect the position of ships negatively, then they may have no other option but to escape. The boats, then, will not have time to hoist the anchor and will have to leave it at the bottom of the sea. Therefore, in such a context it is possible to find a variety of anchors that are not associated with any sunken ship. The same natural phenomena have taken place for thousands of years and have affected every kind of sea vessel. Therefore it is possible to find anchors made of stone, wood or iron and from different periods, side by side or one on top of the other. Stone anchors have also been found in hazardous areas: in the face of dangerous situations such as strong currents or adverse wind, dropping anchor is an option to prevent sinking. If maneuvering is not enough, the rope of the anchor is cut and the anchor is left in the sea in order to escape as quickly as possible. If the vessel cannot escape, it may be dragged away by the wind and current and can possibly sink. In such a case, it is possible to come across an anchor on its own direction of the hole of the stone anchors through which the rope run indicates the direction in which the vessel was going. The single holed stone anchors are rarely found in sunken assemblages. Stone anchors that are found with the sunken ship may be localized together. However, since trade vessels call at several different ports on their sailing itinerary, their cargo, anchors and equipment may be taken from different ports. The

Code	Location	Deep	Shape	Height	Width	Down	Left	Up	Right	Thickness	Hole	MWHC	DFHTC	MTHC
AÇ 1	Alara R.	13mt.	Rectangle	81	66	66	81	44	78	19	13	55	33	18
AÇ 2	Alara R.	13mt.	Rectangle	85	75	75	85	55	85	22	15	62	26	16
AÇ29	Alara R.	9 mt.	Rectangle	62	51	51	62	40	59	11	18	40	12	19
AÇ8	Alara R.	8 mt.	Rectangle	38	42	42	38	41	33	14	11	43	13	14
AÇ10	Alara R.	9 mt.	Bag	38	58	58	36	30	27	19	11	56	13	18
AÇ11	Alara R.	10 mt.	Irregular	48	61	27	44	58	47	16	8	62	12	12
AÇ27	Alara R.	9 mt.	Square	75	72	72	73	63	73	24	17	67	20	23
AÇ4	Alara R.	9 mt.	Rectangle	43	37	37	43	26	43	14	7	31	8	10
AÇ7	Alara R.	10 mt.	Oval/Str.	40	27	16	34	10	30	14	8	28	15	14
AÇ35	Alara R.	8 mt.	Rectangle	82	72	72	82	56	82	18	21	63	22	16
OAH2	Okurcalar	7 mt.	Irregular	50	47	47	35	5	33	8	7	40	18	8
FT14	Fugla	11 mt.	Bag	32	56	48	14	23	16	22	12	40	7	18
SY26	Syedra	3 mt.	Rectangle	51	36	36	47	23	50	16	4	29	11	14
SY33	Syedra	8 mt.	Bag	37	42	30	37	25	35	12	10	41	5	10
SY1	Syedra	9 mt.	Rectangle	71	46	45	65	26	70	13	6	38	15	13
SY17	Syedra	9 mt.	Rectangle	56	39	35	51	20	55	14	8	30	17	10
SY 20	Syedra	9 mt.	Square	79	85	76	75	72	78	42	23	82	21	30
SY9	Syedra	3 mt.	Square	42	41	41	40	36	41	11	5	36	13	10
SY3	Syedra	9 mt.	Rectangle	39	33	26	36	32	38	8	8	33	10	9
FGB31	Finike	12 mt.	Rectangle	43	34	28	22	16	38	16	9	31	9	15
FGB5	Finike	5 mt.	Irregular	33	28	22	23	11	32	11	7	20	5	11
FG25	Finike	11 mt.	Oval/Str.	47	32	7	30	11	16	14	9	22	10	12
CK12	Coban	5 mt.	Rectangle	66	43	38	65	40	66	13	5	42	9	17
AGA17	Adrasan	6 mt.	Oval/Str.	58	35	23	60	8	60	22	8	27	10	10
GKK7	Gelidonya	6 mt.	Rectangle	30	35	35	28	26	27	12	9	33	6	12

\*MTHC: Maximum tickness at hole center      \*DFHTC: Distance from hole to top of the center      \*MWHC: Maximum Widht at hole center

TAB. 1. The table of one-hole stone anchors from the coast of Antalya/Turkey -2011.

Uluburun wreck is an example for such an amalgam of assemblage. The wreck found at Antalya-Kaş and dated to the end of 14<sup>th</sup> century BC, yielded 24 single holed stone anchors (Bass, 1996: 1). The cargo of this ship, which was sailing just within the Eastern Mediterranean ports, is assembled from different regions like Cyprus, Egypt and Syria. The anchors are thought to be from Syrian or Palestinian origin. Their localization is based on their formal characteristics, not on the origin of the cargo.

Stone anchors or pierced stones that look like anchors, besides their main function, serve several other purposes, as it is the case in Uluburun wreck. Stone anchors are often thought to be used as ballast stones to keep the ship stable (Pulak, 2006: 93). A couple of these anchors weighing are 201 kg.; most of them are between 164 and 183 kg and the lightest ones is 97 kg. According to Honor Frost, the Uluburun shipwreck's anchors were part of the cargo which may have contributed to the ship's fast sinking (Croome, 2011: 199). It is likely that a few of them served as the anchors of the vessel itself. On the other hand, for a ship just 15 meters long, it would not be so easy to drop and weigh anchor in deep water, especially in case of stormy weather. It is difficult to use larger anchors because their weight is not suitable for a vessel of this size. Explanations of the anchoring methods of Uluburun ship are not enough for the practical use and experimental archeological studies are needed on this subject.

Stone anchors of the same form are also found in the olive workshops. It is believed that these pierced stones were used as weights in the process of olive crushing. These pierced stones are found in the harbor of Antioch (Gazipaşa) and similar examples are stored in the Alanya museum (Marten, 2005: 45). Some stone anchors are also used in the wall constructions as secondary use. For example, the stone anchors similar to the



FIG. 3. A one-hole stone anchor (?) in the modern supporting wall of the private structures inside Alanya castle, 50 meters from the sea coast (Photo by Hakan Öñiz).

ones found in the port of Israel Caesarea and dated to 11<sup>th</sup>-13<sup>th</sup> century AD are secondarily used at the same area in the wall constructions dated to 11<sup>th</sup> century AD (Raban 2000: 261). Similarly, at Hala Sultan Tekke in Cyprus, 41 stone anchors, probably from the Late Bronze Age, are found inside or on the surface of the walls (Aström and Svensson, 2007: 45). In Ugarit and at Ugarit's port Minet-el Beide stone anchors were used in tombs again as building elements (Pulak, 2006: 93). Unfortunately the secondary use of stone anchors is not a practice that remains in the past but is still valid in present day. One of the supporting walls of the private structures inside the Alanya castle that were built a few years ago includes a stone anchor (FIG. 3). This supporting wall is situated on the coast of a natural harbor that was known to be in use during the Hellenistic and probably earlier periods.

One holed stone anchors are attached to the ship with a rope that runs through its hole. The weight of the stone helps the ship to stand still on the surface. On the other side, some single holed stones form a part of the composite anchors. During a research done on the shores of Israel's Dead Sea in 2006, a new composite anchor type was discovered. Two of the four anchors discovered here were found together with their wooden trunk, ropes, branches and weight stones. The other two anchors are understood to be of the same kind, as they both have holes in the middle of the weight stones (Oron *et alii*, 2008: 296, 300). The dimension and form of these pierced stones, which date to the 10<sup>th</sup>-12<sup>th</sup> centuries AD, are very similar to the single holed stone anchors. These composite anchors are dated through radio-carbon tests conducted on samples from its rope and wooden components. The

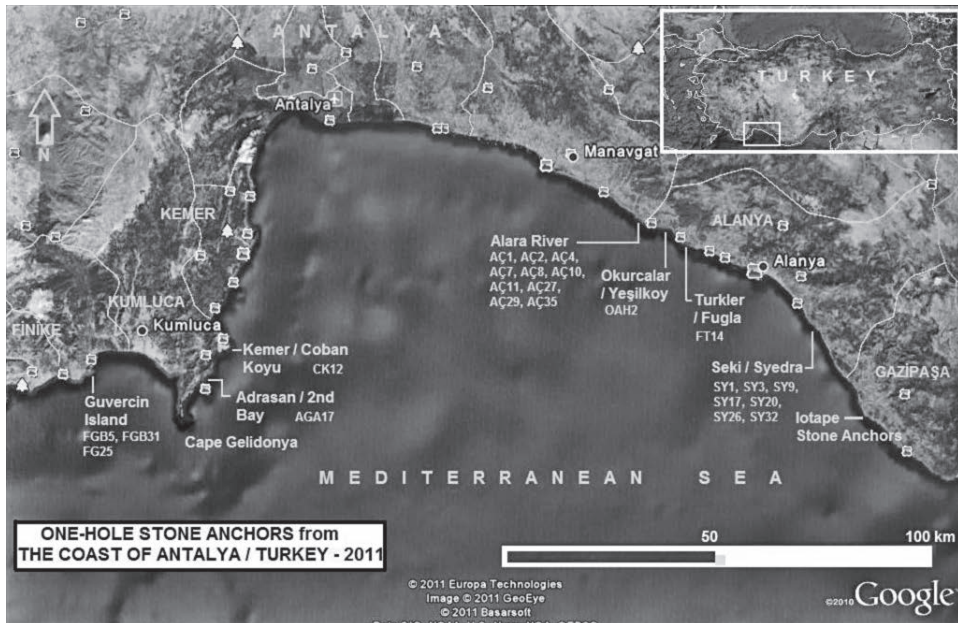


FIG. 4. One-hole stone anchors found in Antalya, 2011.

Dead Sea is only 77 km away from the Mediterranean Sea, hence it is logical to expect to see these types of anchors in the Mediterranean Sea as well. At this point, the stones with holes in the middle and the types that look like the ones found in Mediterranean may be considered as components of composite anchors. It is well known that long rectangular shaped stones with holes are used as composite anchor components in the coasts of Indian Ocean and South Africa (Kliwa Kisiwani) (Chittick, 1980: 73). However, this type of anchor is easily distinguished from the anchors that are discussed in this article.

#### ONE-HOLE STONE ANCHORS FOUND AT THE MOUTH OF ALARA RIVER (ALANYA) (FIGS. 4, 5)

The **Alara River** that runs within the borders of the town Okurcalar in the district of Alanya, is situated 47 km. west of Alanya. During the survey at the mouth of the river, 10 single-holed stone anchors along with other finds have been detected. These anchors (except AC 7) seem to be made up of limestone. The bottom is deep and sandy and it is very likely that the sand covers more anchors. These anchors demonstrate that the Alara River was used as a transportation medium to reach the inner parts of the region and/or used as a river port. Although the opening of Alara River to the sea is quite shallow, the depth reaches up to 2 meters, and probably gets deeper further upstream. Although the earlier depth of the stream is not known, today the water level is suitable for the transportation of medium-sized boats (except at the mouth of the stream). A castle named Pirate Castle or Alara Castle, which is located 5400 me-

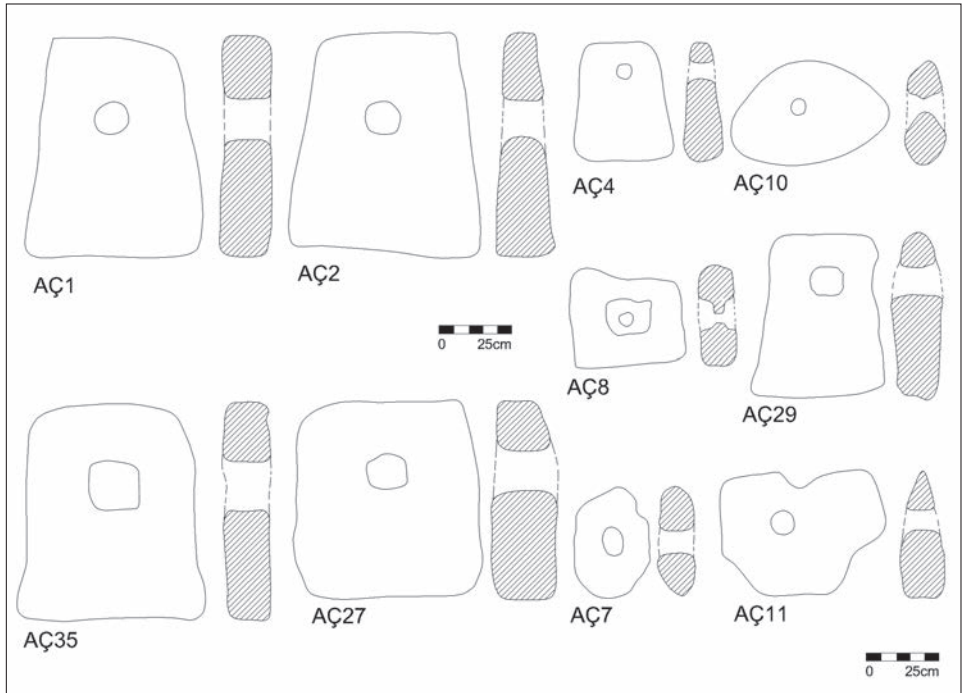


FIG. 5. One-hole stone anchors from the entrance of Alara river Alanya-Antalya 2011.

ters inside the mouth of the river, is dated back to the Byzantine period. However, it might also have been used in earlier periods. Size and form of the anchors that are found here (numbered as AÇ1 and AÇ2 and the form of the anchor numbered as AÇ4) are similar to those found in the Uluburun and Israel-Kfar Samir (to No: 3) group. This anchor group is known to be of Syrian origin (Refer to: Galili *et alii*, 1994: 105-106). The commercial link between the Assyrians and the Anatolians during the old Assyrian period is well known (Beginning of the Second Millennium BC). There are several records about commercial activities of the Assyrians with the Hittites and Mycenaean, as well as with Egypt, Cyprus and other Eastern Mediterranean settlements (Refer to: Miglus, 2006: 243-244). The Cilician coast has been probably used to reach Central Anatolia for these commercial relations (Refer to: Boer, 2006/2007: 284-285). The anchors numbered as AÇ1 and AÇ2 were found at a depth of 12 meters. There is a distance of 2 meters between them and it is highly probable that they belong to the same ship. Anchors numbered as AÇ35, AÇ27, and AÇ29 are also similar to the Syrian type of anchor. The holes of AÇ35 and AÇ29 are square shaped. This feature distinguishes them from groups found in Israel-Kfar Samir. The square holed examples are found in the Ugarit (Syria), Byblos and Uluburun wrecks (Refer to: Gianfrotta and Pomey: 1981: 298). Even though AÇ7 and AÇ11 do not possess any special form, similar ones are found off the Karpazia peninsula of North Cyprus (Refer to: Green, 1971: 170, 171; Oniz and Zafer, 2007: 76-77). AÇ8 is different from the anchors found in this group. This anchor contains similarities with the composite holed stone anchors

found in the Israeli Dead Sea (Refer to: Oron *et alii*, 2008: 296, 300). Therefore, this pierced stone might either be a regular one-holed stone anchor or the stone part of a composite anchor. AÇ10, with its form similar to a bag, is different from the anchor forms found in Byblos and Syria. This form highly resembles an anchor illustrated on a painted Cypriot vase from the Bronze Age, which is now in the British museum and on the logo of NAS (Refer to: Croome, 2011: 200; Frost, H., 1989: 173).

#### ONE HOLE STONE ANCHORS FOUND AT SEKI-SYEDRA (ALANYA)

(FIGS. 4, 6)

The studies conducted to investigate the ancient city of Syedra located near the village of Seki in Alanya, yielded 7 single holed stone anchors. There is a rectangular shaped island located 60-100 meters away from the shore directly across wharf-pier structures that form the city harbor. This isle runs parallel to the shore and forms a natural breakwater. The positioning of the isle and the remains of some coastal structures reveal that this area has been used both as a shipyard and a port since the Roman times. The ideal positioning of the isle makes it a suitable shipyard for the earlier periods, too. The underwater survey was mostly concentrated on the tips of the islets located on the west end. I think that all of the single holed stone anchors are made from limestone. However since the legal framework of the survey restricts any kind of physical intervention, we did not do any analysis on the type of the stone.

The anchor numbered as SY17 is very similar in form to Cretan and Syrian anchors (Refer to: Galili *et alii* 1993: 75). Actually, similar ones have been found in Cyprus. Even though SY1 and SY26 are similar to the ones found in Syria and Cyprus (Refer to: Green, 1971: 170, 171; Oniz and Zafer, 2007: 76-77). SY3 and SY9 are closer to square shaped anchors than rectangular shaped ones. These features are similar to the samples found in Mozia-Sicilia (Refer to: Gianfrotta and Pomey: 1981: 298). Although rarely seen, this form of anchor is found in Cyprus, too. Examples similar to anchor SY3 are found in Mersin-Aydincik (Rough Cilicia) (Refer to: Evrin *et alii*, 2003: web). SY 20, with its square form, is similar to ones found in Sicilia. However, there are some size and shape differences. SY33, with its bag-like form, resembles the samples found in Malta (Refer to: Gianfrotta and Pomey: 1981: 298).

#### ONE HOLE STONE ANCHORS FOUND IN THE SHORES OF ALANYA

(FIGS. 4, 6)

As a result of researches done around Yesilkoy, which is located in the town of Okurcular in Alanya, two places naturally suitable for anchoring were detected. In one of the surveys, the single holed anchor OAH2 was found at a depth of 7 meters. These anchors, which are different from the standard single holed stone anchors with their amorphous shape, are found both in Cyprus and Rough Cilicia (Refer to: Green, 1971: 170, 171.; Evrin, 2000: 115).

At the shores of Alanya-Turkler-Fugla, there are remains of harbor construction that are related to the antique city of Ptolemaios. In the surveys inside and outside of the breakwater, in addition to a one holed stone anchor (FT11), stone net weights, high quantity of amphora fragments and other remains were found. Similar examples to this anchor discovered at 11 meters deep are found during these researches and

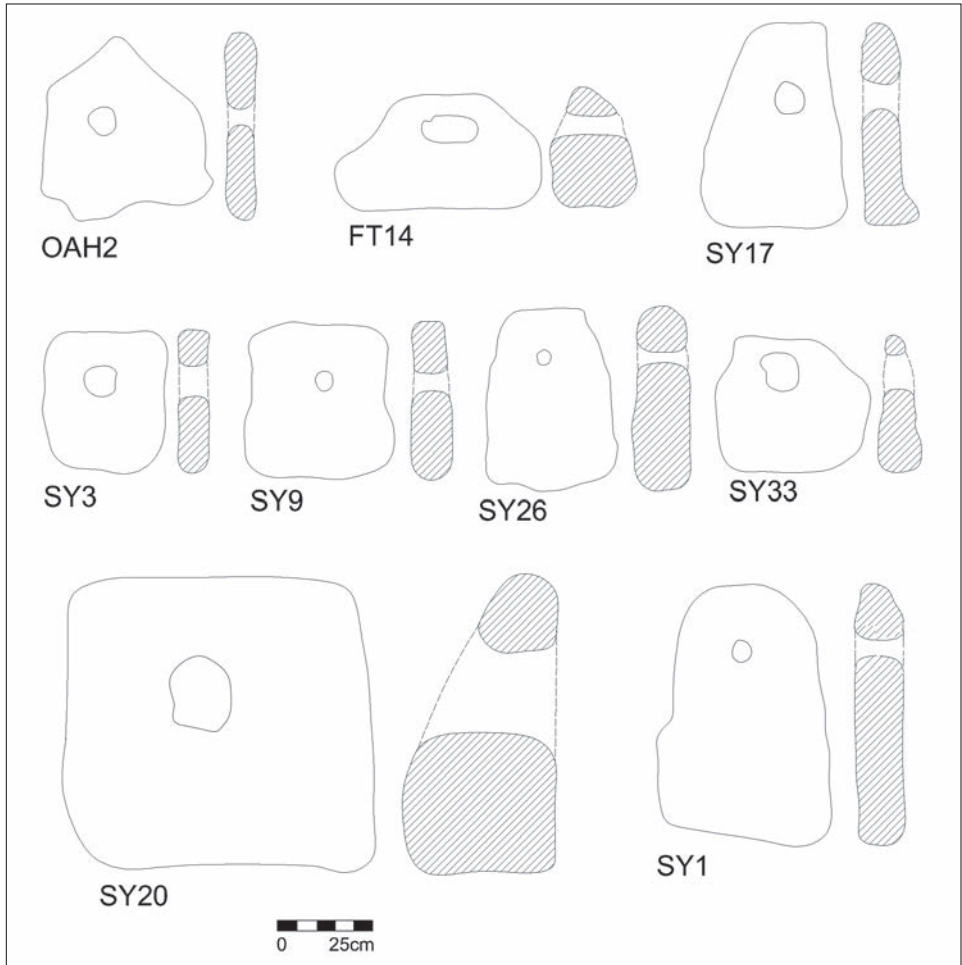


FIG. 6. One-hole stone anchors from Alanya of Antalya 2011.

also in large quantities on the eastern coast of Cilicia. Excavations done in 2001 at **Iotape** Harbor in Alanya indicate that out of the 6 anchors, 4 are of this type (FIG. 7: Stone anchors of Iotape). This anchor type that is rarely found in Cyprus might be more specific to Cilicia.

ONE HOLE STONE ANCHORS IN FINIKE-KUMLUCA-KEMER REGION  
(FIGS. 4, 8)

**Andrea Doria** is a natural harbor between the towns Finike and Demre in Antalya. At the entrance of the harbor, there is a shipwreck loaded with amphorae and other remains. Two single holed stone anchors also found in the harbor. The anchor FGB<sub>31</sub>, found 11 meters deep, has similar features with the forms found in Egypt and



FIG. 7. Iotape stone anchors from the rescue excavation by Antalya Museum in 2000, now in Alanya Museum (Photo by Hakan Öviz).

Cyprus (Refer to: Galili *et alii* 1993: 75; Gianfrotta and Pomey: 1981: 298). The anchor FGB5, which is found in the middle of harbor, does not give an exact form and thus is similar to other local anchors around this region and the area of Cyprus. Around **Guvercin Island**, is located between the towns Finike and Demre, there are several kinds of anchors that belong to different ages. This long and narrow island has a natural breakwater form. During the survey around this island, only one single holed stone anchor was found. Examples similar to the anchor FG25, which is 11 meters deep, are detected both along the coasts of Cilicia and Cyprus. In this region, the bottom is sandy; hence it is possible to find more artifacts underneath the sandy deposit.

There is a natural harbor **between Kemer and Adrasan** named as “Çoban cove” or “Pirates cove”. In this area, at least two shipwrecks and a single holed stone anchor were found. The anchor, CK12, at 5 meters deep, is similar to the Syrian anchors but the diameter of its hole seems to be smaller (Refer to: Galili *et alii*, 1994: 93; Gianfrotta and Pomey: 1981: 298). An important anchorage has been identified **between Adrasan and Cape Gelidonya**. In this area, at least two amphora wrecks along with eight iron anchors, three three-holed stone anchors, and one single holed stone anchor were found. This stone anchor AGA17 is found 6 meters deep. The form of the anchor is similar to other anchor examples from Cyprus and Cilicia.



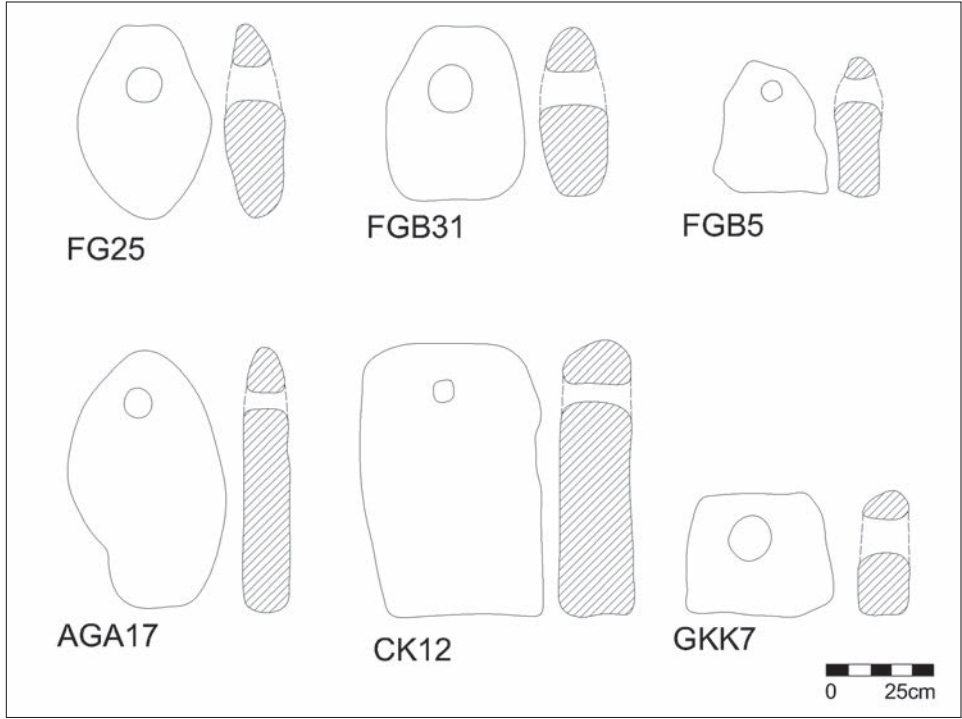


FIG. 8. One-hole stone anchors from Antalya 2011 (Kemer, Kumluca, Finike).

There is an unassuming small natural harbor to the north-west of the Melannippe cape between Gelidonya cape and Karaöz village. At the coast of the cove there is a church of the Byzantium era and next to it a small Byzantium settlement called **Melannippe**. Here, fishing net weights, amphora fragments, and a single holed stone anchor (GKK<sub>7</sub>) were found at a depth of 6 meters. Similar anchors are found in this region and in Cyprus.

#### CONCLUSION

According to research results, it is thought that the use of single holed stone anchors around Cilicia, which is the Eastern part of Antalya coast, was more widespread than that of Lycia area, which is the Western part of Antalya. The mouth of Alara River located on the coast of Alanya has traces of international trade from the Bronze Age, especially in the Eastern Mediterranean. In other findings, it is noted that Mediterranean islands, especially in Cyprus, contain various similar anchor examples. These examples reveal that there have been maritime interactions between these areas. Typically sailors are more open to traditional and cultural interactions. Therefore, the similarities between the stone anchors used in different regions could be the result of cultural interactions. Sailing between Cyprus and the shores of Cilicia takes only one day. Even a small fisherman boat can easily sail within this area in suitable weather

conditions. Similarities between the anchors that are found in the Eastern Mediterranean islands and the shores of Antalya, are due to the similarities in the production process of the stone anchors. Most of the anchors are made of limestone. This type of stone is abundantly found in Eastern Mediterranean coast. It is a durable type of stone and shapes easily. To open a hole into stone was the cheapest way to produce an anchor for the sailors. For this type of easy solution, cultural interaction is not necessary. Our research in the area will continue in the upcoming years.

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#### ABSTRACT

During the first systematic underwater survey of Antalya, located at the North-East coast of the Turkish Mediterranean, harbours, anchorages, mooring stones, lead stocks of wooden anchors, several kinds of iron anchors, stone fishing sinkers and also shipwrecks have been found, indicating activ-

ity from different periods. The following article will discuss twenty-five one-holed stone anchors discovered during those explorations between 2009-2011. Some of these anchors are similar to anchors from Bronze Age Cyprus and Ugarit and may indicate maritime activity from that period on the coast.

**KEYWORDS:** Underwater archaeology, underwater cultural heritage, shipwrecks, stone anchors, one-holed stone anchors, stone fishing sinkers, harbours, anchorages, anchor chain, Antalya.