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The Late Roman Anchorage of Cape Petounda, Cyprus

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The topic of this article is the underwater survey that took place at Cape Petounda on the southern coast of Cyprus in the summer of 2016. In the ancient anchorage of Cape Petounda, abundant identifiable underwater evidence (45 stone anchors and two lead stocks) and terrestrial archaeological remains testify that this previously unsurveyed area presented important activity in the past.

The site

Petounda is an area in the district of Mazotos, Larnaca (Fig.1). The literal meaning of the toponym is 'she who is flying' (from the Greek verb πετώ, fly). A few other names have been cited for this area, such as Bendunda, Bolas Burnu (Ottoman toponym), Cap Mezotos, and Cape Malzotos (Goodwin, 1985:1349). On older maps the cape is mainly named after the nearby village of Mazotos; this indicates that the present name for the cape might be more recent.

Nowadays Petounda is an agricultural area, and is also a well-known spot for spear fishing throughout the year. This activity raises the risk of looting and highlights the necessity for recording and protecting any ancient remains in this area.

At the edge of the promontory (Fig.2, no.1), which is the highest point in the area (maximum height 10m), stand the remains of an early Christian baptistery. This is the only official archaeological activity that has taken place in the area; the site of the baptistery has been declared an Ancient Monument of Schedule B (Georgiou, 2013: 117).

Topography

The prevailing winds during the prime sailing season in Cyprus, which extends from mid-March to mid-November (Casson, 1995: 270-272; Morton, 2001: 255), are west- and northwesterlies (Murray, 1995:39). The specific winds in the region are similarly mainly from the west: west-northwest (WNW), west (W), and west-southwest (WSW). There are also east-northeast (ENE) winds (Fig.3).

Taking into account the topography of the cape and these prevailing winds, two observations can be made: a) The 10m high cape on the southwest of the Petounda bay offers some protection from WNW, W, and WSW winds (Fig.4), and; b) The reef formation on the east of the bay might serve to minimise the impact of rough seas from S and SW winds.

Coastal changes, such as land erosion and sediment accretion, are phenomena that can dramatically affect the preservation of coastal archaeological sites. At Cape Petounda, evidence of erosion has been observed, with the shore suffering both from cliff erosion around the cape (southwest) as well as from shore erosion in the northeast (Fig.2, no.4). In order to examine, compare, and prove the existence of coastal changes in the area, aerial orthophotos from the Department of Lands and Surveys from 1963, 1993, and 2014 (Fig.5) were employed, where the shorelines of these three periods were drawn and layered on the same file. **This analysis indicates that coastal erosion averages 0.5m per year** (Fig.6).

Moreover, in the eroding coastline located northeast of the baptistery site (Fig.2, no.4), the erosion uncovered a section (around 20m long) with dense pottery deposits (Fig.2, no.6). The stratigraphy shows only one layer of pottery, which represents a single period of occupation. This is the only terrestrial site of the coast of Cape Petounda for which the Department of Antiquity granted permission to collect sample sherds for the purposes of this survey. The main types of these sherds were Late Roman 1 (LR1) and Late Roman 4 (LR4).

In the same area but underwater (Fig.2, no.7), a high density of sherds was also noticed, potentially as a result of the material drifting from the eroding shore to the sea.

The underwater survey

No visible port infrastructure could be observed on the shore or under the sea in the area of the anchorage, although a reef, which could have played the role of a natural mole, extended around the area of the anchors, with an orientation from the south to the north (Fig.2). The material of the reef, and whether it was manmade or entirely natural, could not be determined, since it is entirely covered with dense vegetation of seaweeds. However, its shape details were visible. No pottery was found on the reef or could be associated with it. At its northern end there is a 120m-wide opening between the coastline and the reef edge (Fig.2, no.10). This could have been the entrance to the anchorage, as the depth of that opening is approximately 2.0-3.0m while that of the reef is less than 1.0m.

The underwater survey covered the area that extends from the reef to the edge of the promontory to the south and toward the coastline to the west. The seabed in this area is sandy with dispersed rocks and seaweed that partially cover some of the stone anchors. The highest number of anchors was found approximately 60-100m off the coast (Fig.2, no.9), at an average depth between 2m and 4m.

During the underwater survey a total of 45 stone anchors was found, 39 of which are one-hole weight anchors, and six of which are composite anchors. Of the composite anchors, two have two holes, and four have three holes. A lead stock was also found during the reconnaissance survey, but it was impossible to relocate during the topographic survey. Moreover, the author's latest visit to the site in July 2017 discovered two more lead parts of composite wood-lead anchors: a reinforcement collar (M001) (Fig.7) dated from the 2nd century BC to the 3rd century AD (Haldane, 1985: 556, ill.7), and a removable stock (M002) (Fig.8) dated from the late Hellenistic to the late Byzantine period (Kapitan, 1985: 393, fig.12).

Catalogue of Stone Anchors from Petounda

The 45 stone anchors that were found in Petounda vary in shape, type, quality, and number of holes. Their weight is a parameter that has not been taken into account as none of the anchors have been recovered and weighed. The catalogue of anchors is presented in groups, following classification based on the number of holes, as follows:

- I. Two-hole anchors are the rarest of all (Frost, 1963a: 9) and have not been fully studied yet. To the best of the author's knowledge, from a total of 397 stone anchors that have been found in underwater sites in Cyprus only nine had two holes (Table 1).
- II. Three-hole or 'composite anchors' were most probably introduced during the Late Bronze Age and employed a more advanced weight mechanism (Frost, 1963a: 13). Their innovation was the addition of two holes at the lower part of the anchor, close to the corners, through which wooden or metal flukes were placed (Grossmann & Kingsley, 1996: 51). Composite anchors have been found in most of the underwater sites around Cyprus (Table 1).
- III. Single-hole or weight anchors (Frost, 1963a: 8; 1963b: 55) used their weight as the main holding power to restrain a vessel (Frost, 1985: 356-357). They had a pierced hole, which in most cases was located at the top centre of the stone (McCaslin, 1980: 18-20), through which the anchor rope was tied. They were the earliest and most enduring stone anchor design. This group is the most prevalent around Cyprus (Table 1).

The catalogue of Petounda's anchors is presented in groups, following the above classification, as follows (Fig.9):

- I. Composite anchors with two holes (2)
- II. Composite anchors with three holes (4)
- III. Weight stone anchors with one hole (39)

One-hole stone anchors, which comprise the largest group, have been further classified into three sub-groups based on their shape:

- Group A: Rectangular (11)
- Group B: Triangular (13)
- Group C: Irregularly shaped or roughly cut (15)

Finds

Due to the fact that stone cannot be dated with scientific methods, such finds cannot provide clear answers on a site's period. On the other hand, the quantity of pottery sherds observed underwater in the area of the anchorage was very limited, and was located in two distinct sites: the northern site (Fig.2, no.7) and the southern site (Fig.2, no.9). Between the two, the northern site presented the highest density of sherds, potentially as a result of the drift of material from the eroding shore to the sea. The main type of sherds in this site came from LR1 amphorae, one of the commonest types in the eastern Mediterranean and around Cyprus during the Late Roman period (Demesticha, 2015:58).

A small sample of representative sherds was collected from the seabed of both sites under research for additional documentation, future analysis, and comparison to the pottery from the eroding shore. In addition to LR1 amphorae, following the Cypriot LR1 amphora classification (Demesticha, 2003: 471-472), some fragmentary necks of unidentified closed-shape vessels and pieces of broken pan roof tiles were also found underwater.

Conclusions

The anchorage of Cape Petounda

There is little doubt that there was an anchorage at Cape Petounda during antiquity. This is supported above all by the 47 anchors that have been mapped (45 stone anchors and two lead parts of wooden anchors). Moreover, the characteristics of the natural landscape could render it as a safe shelter, especially if the coastal changes are taken into consideration. The work of this survey has also corroborated the hypothesis by Georgiou (2013: 118) who suggested that a 'small harbour' could have existed in the vicinity of the excavated baptistery.

It seems that this anchorage used to serve small ships; the commonest size of vessels during Roman times (Houston, 1988: 553). This is indicated by the size and types of the stone anchors, which are mainly one-hole anchors. Additionally, the depth of the anchorage at Cape Petounda, found to range today between 2.0m and 3.0m, could not have been used for larger ships (Nibbi, 1998: 207).

Existence of a settlement in Cape Petounda

The fact that the anchorage at Cape Petounda is related to the findings of the coastal site is of particular interest, because it is indicative of the site's role not only as a shelter from the weather conditions but possibly as the fishing or trading harbour of a coastal settlement.

The fact that the anchors have been found at a close distance of approximately 100m from the coast off the baptistery also indicates a connection of the anchorage to the land. There are several examples of basilicas in Cyprus that were built very close to the sea. The existence of coastal basilicas in prominent positions showed the religious importance of a site, but also demonstrated the power that the church had in Cyprus during Late Antiquity (Papacostas, 2001: 107).

Furthermore, it was common for maritime facilities to exist close to religious sites regardless of whether they were in large cities or in isolated sites. This would allow the ports or harbours to serve the needs of the churches and facilitate visitors in reaching them. Accordingly, the anchorage at Cape Petounda could have been used to provide access by sea to the baptistery and potentially to a rural settlement nearby.

Evidence of stone anchor use in Late Antiquity

Another conclusion that can be reached based on the finds of Cape Petounda is that the main active period must have been Late Antiquity. This is in contrast to many other archaeological sites where stone anchors have been typically associated with the Late Bronze Age.

Dating stone anchors is complicated, as the periods when they were in use spans from the Late Bronze Age throughout antiquity to as late as recent times (Nibbi, 1993: 5). Therefore, dating has to rely on contextual archaeological evidence or architectural remains. However, the diagnostic finds from the underwater site are limited to a few sherds of pottery and to the three lead parts of wooden anchors (two recovered; one photographed but missing).

Due to the low number of underwater sherds, the stone anchors that have been found in the site under research cannot be dated with certainty. Their dating will thus have to consider terrestrial evidence, such as the existence of the baptistery at Cape Petounda, dated to late 4th and early 5th centuries AD (Michail, 2013: 138-139). Moreover, the pottery that has been collected from the shore and the seabed belongs to LR1 and LR4 amphora types, while evidence from other eras is absent from the terrestrial stratigraphic section. Therefore, the majority of dating evidence in the area under study leaves no doubt that the busiest and maybe the only period of use of Cape Petounda's anchorage and of its stone anchors must have been Late Roman.

Petounda as part of a Late Antiquity maritime network

The final hypothesis of this survey is that Cape Petounda could have been part of a Late Antiquity maritime network on the south coast of Cyprus. Rickman has already suggested that small harbours or anchorages could be part of a cluster of maritime facilities that served different needs of trade (Rickman, 1988: 260). During the last decades a few coastal sites that were active during the Late Roman period have been identified in Cape Petounda's vicinity. These sites are (Fig.10):

- a. Alaminos-Latourou Chiftlik with dense concentration of 6th and 7th century AD LR1 amphorae (Leonard & Demesticha, 2002: 200)
- b. The nearby production centre of LR1 amphorae (Manning et al., 2000: 245) Zygi Petrini (Manning et al., 2000: 235; Todd, 2004: 143)
- c. Maroni Vrysoudhia with the Late Roman remains of architectural parts on the erodible shore (Manning et al., 2002: 119)
- d. The sites of Softades (Georgiou, 2013:125) and Perivolia (Georgiou, 2013: 124) in the east of Petounda, where remains of Roman and Early Christian coastal settlements have been recorded

Adding these coastal sites to the map that John Leonard (1995) presented in his study on Roman ports, harbours, and anchorages in Cyprus (Fig.11), one can observe a dense maritime network along the southern coastline of the island. Similar networks during Roman times might also be found in other areas of Cyprus, such as on the Akamas peninsula in the west and in the area of Akrotiri around the Limassol district.

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Figures

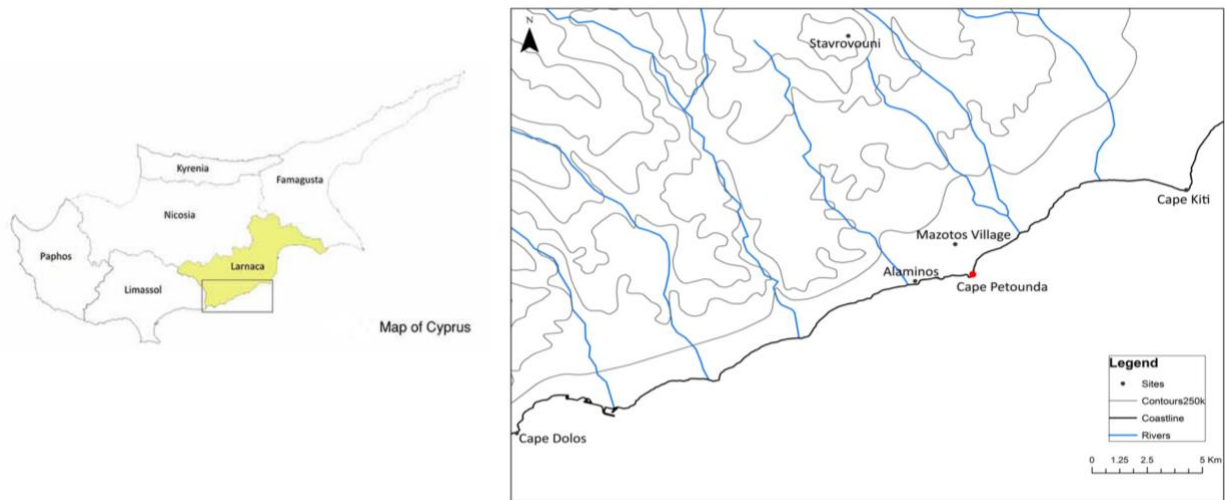


Figure1: Map of Cyprus and detail map of Cape Petounda, between Cape Dolos (on the west) and Cape Kiti (on the east) (map & GIS by Niki Kyriakou, University of Cyprus)

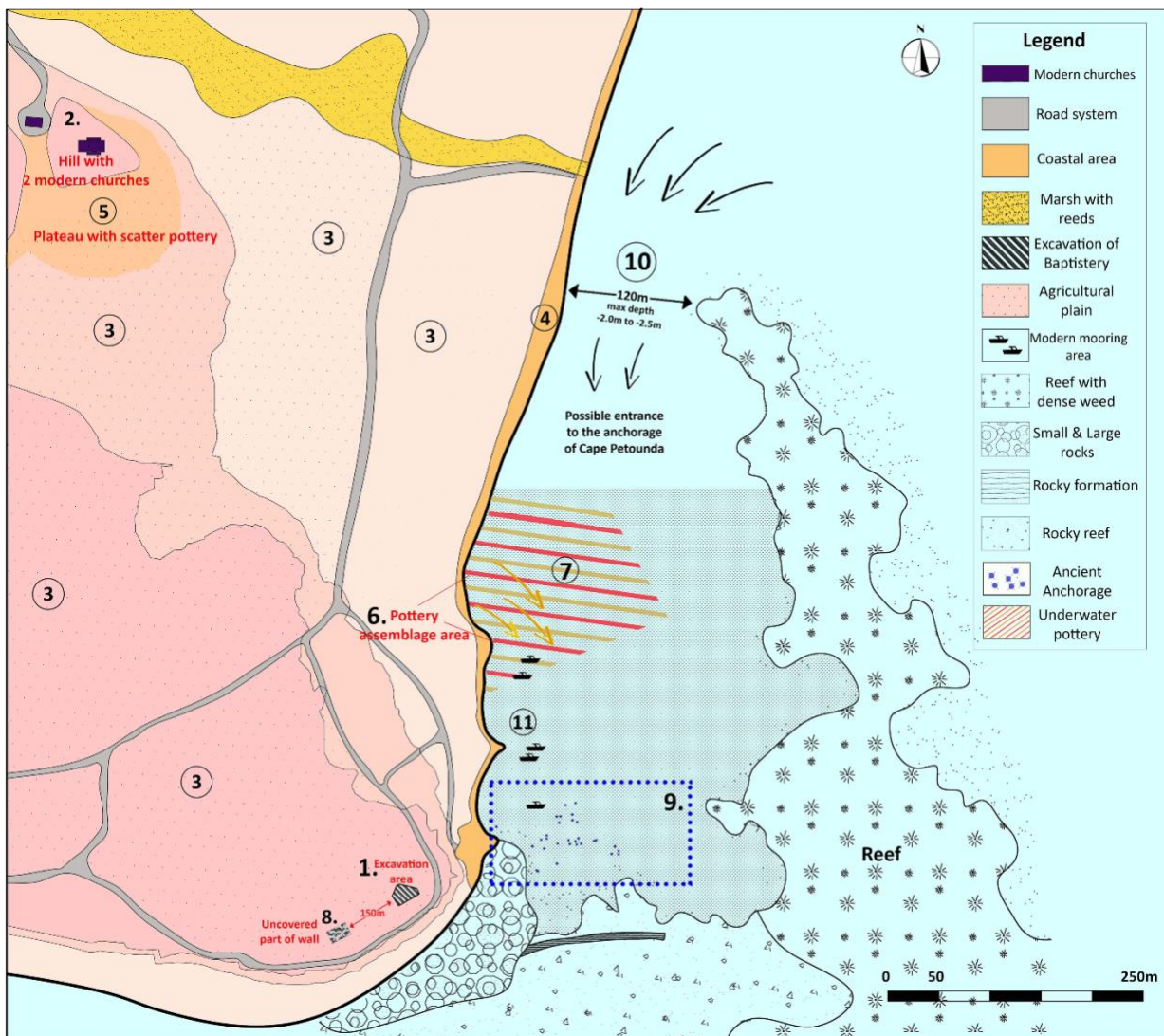


Figure 2: Map of the Cape Petounda area marking sites of special interest: 1. the excavation of the baptistery; 2. the hill with two modern churches (NW); 3. agricultural plains; 4. accessible coastal area; 5. area with scattered pottery at the base of the hill; 6. pottery assemblage by the sea (E); 7. area of the drift material from the erodible shore to the sea; 8. site with uncovered part of a wall on the SW of the excavation; 9. ancient anchorage; 10. possible entrance to the anchorage; the gap between the reef and the shore is ca. 120m and the depth varies between 2.0m and 2.5m; 11. modern mooring sites (drawing & illustration Lefkothea Papakosta, University of Cyprus)

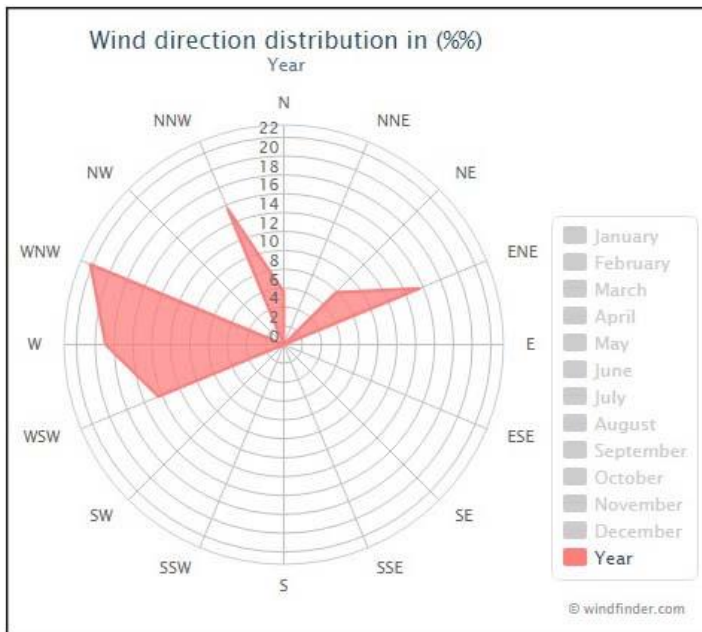


Figure 3: Wind direction distribution at the Mazotos coastal area (Cape Petounda) (source: Windfinder.com, 2017)

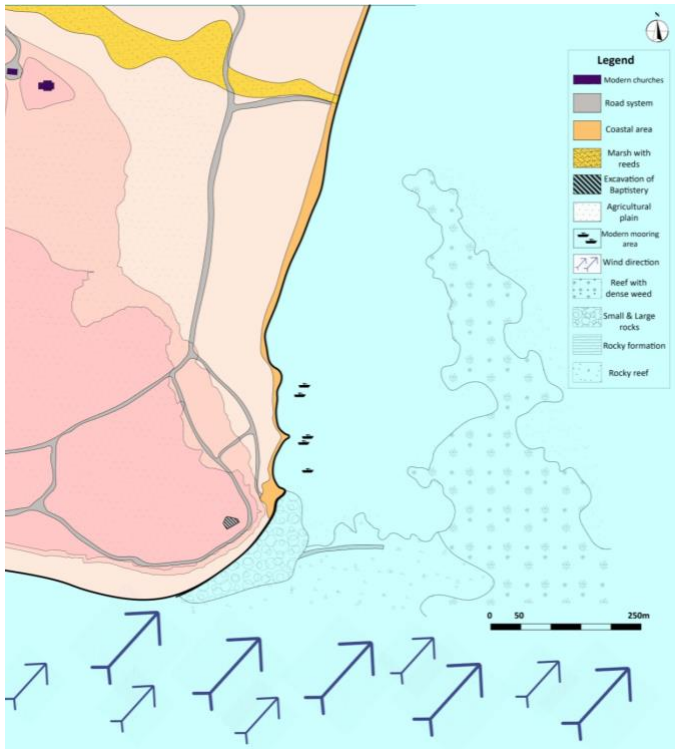


Figure 4: Plan of Cape Petounda with WSW wind (drawing & illustration Lefkothea Papakosta, University of Cyprus)



Figure 5: Aerial orthophotos (1963, 1993, 2014) with shoreline in colour

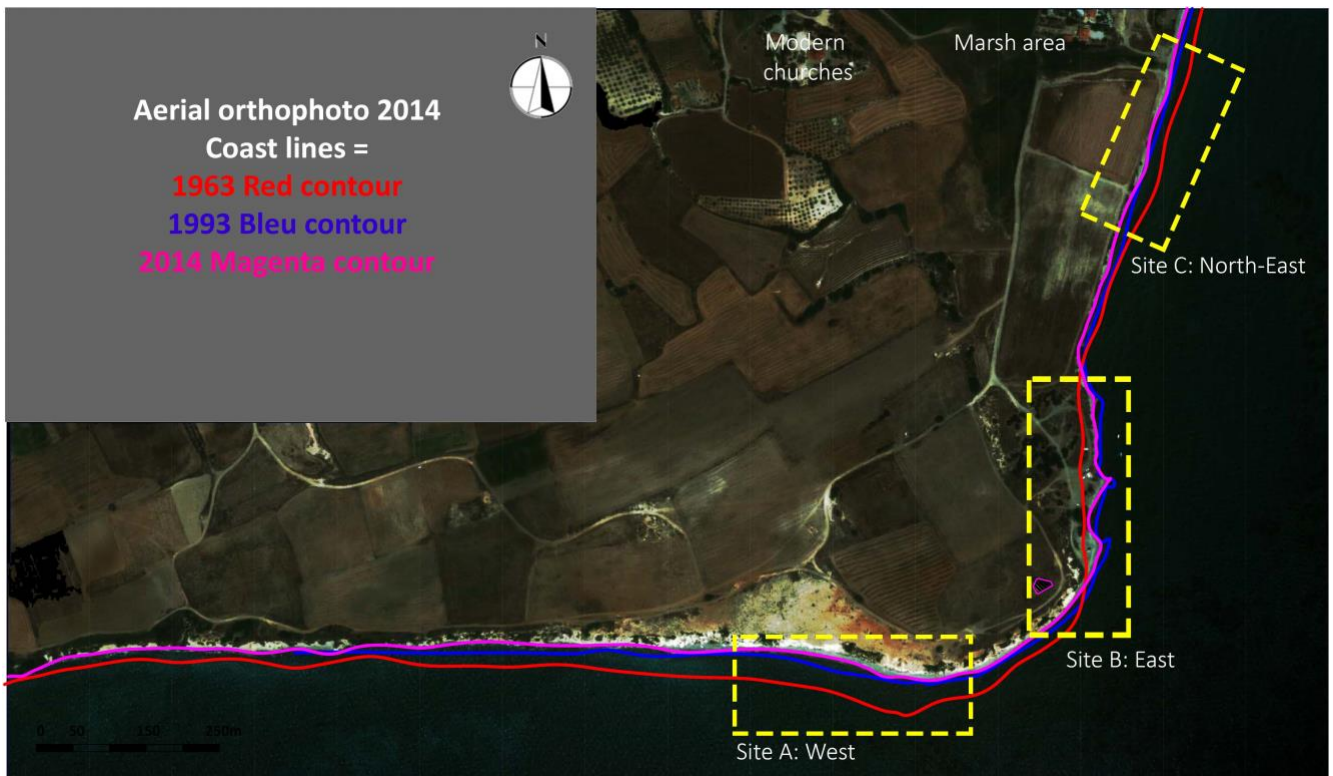


Figure 6: Aerial orthophoto (2014) of Cape Petounda. Highlighted are the three coastal sites under examination (Site A, B & C). The layering of the shoreline has been drawn for three different periods (1963 in red, 1993 in blue, 2014 in magenta) (drawing & illustration Lefkothea Papakosta, University of Cyprus)

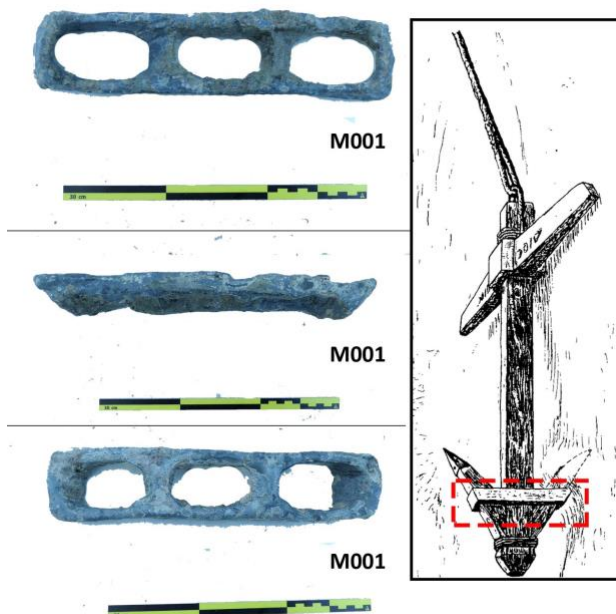


Figure: Left: M001, Reinforcement collar from a two-armed anchor (photo Lefkothea Papakosta, University of Cyprus). Right: Schematic drawing with the position of reinforcement collar marked (Kapitan, 1984:33, fig.1)

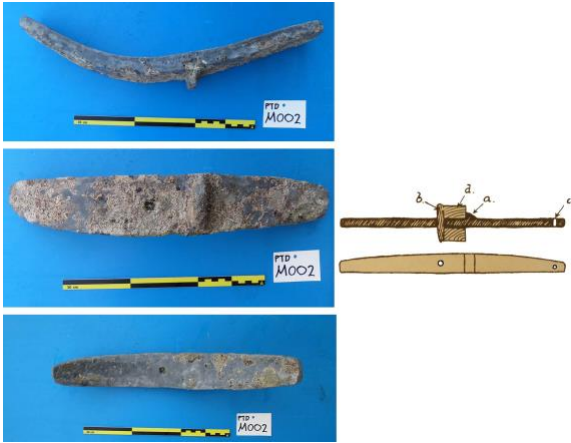


Figure 8: Left: M002, Bow-shaped removable lead stock (photo Lefkothea Papakosta, University of Cyprus). Right: Schematic drawing of the removable lead stock (Kapitan, 1985:393, fig.12)

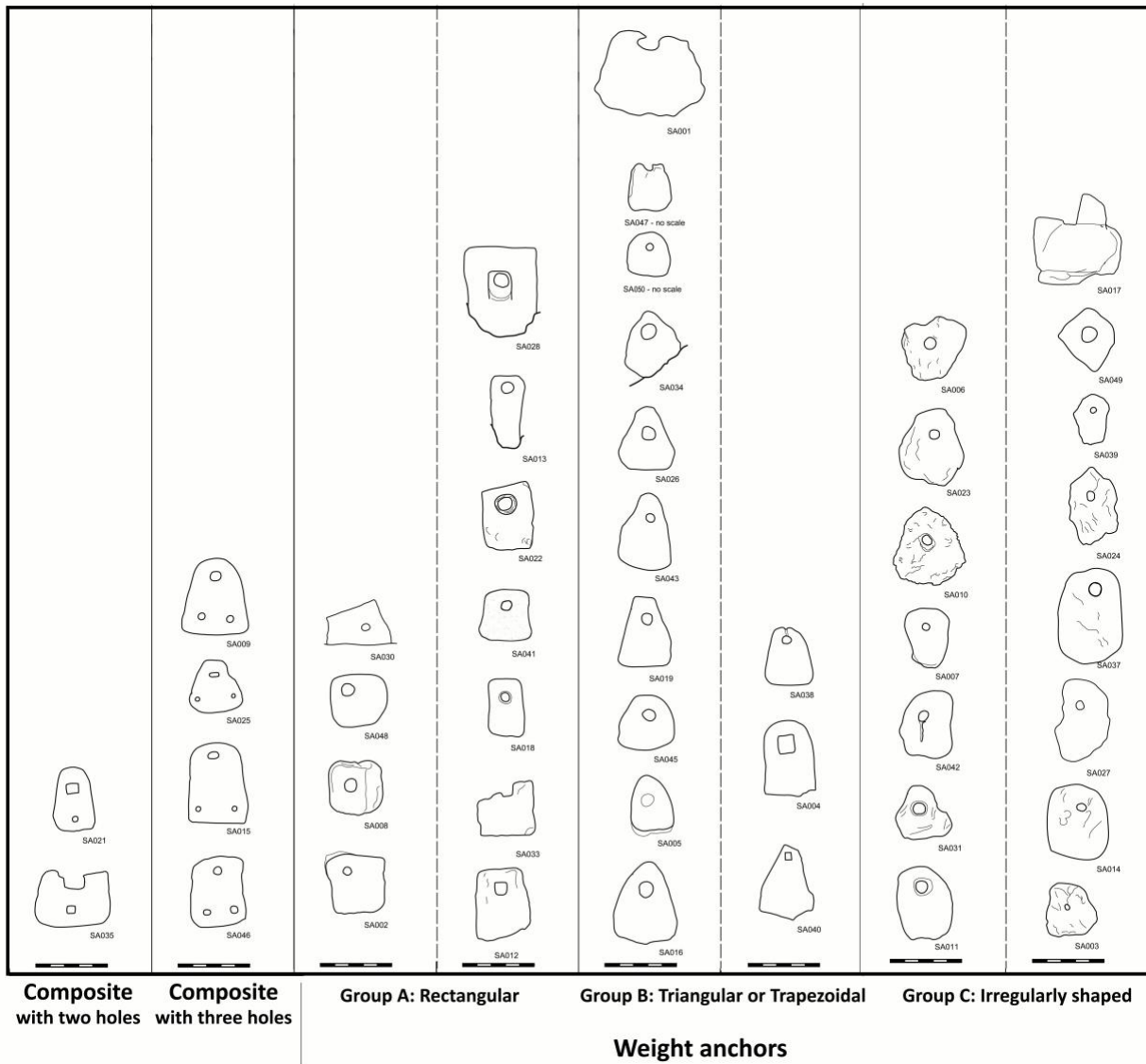


Figure 9: Typological classification of the stone anchors found at Cape Petounda (drawing & illustration Lefkothea Papakosta, University of Cyprus)

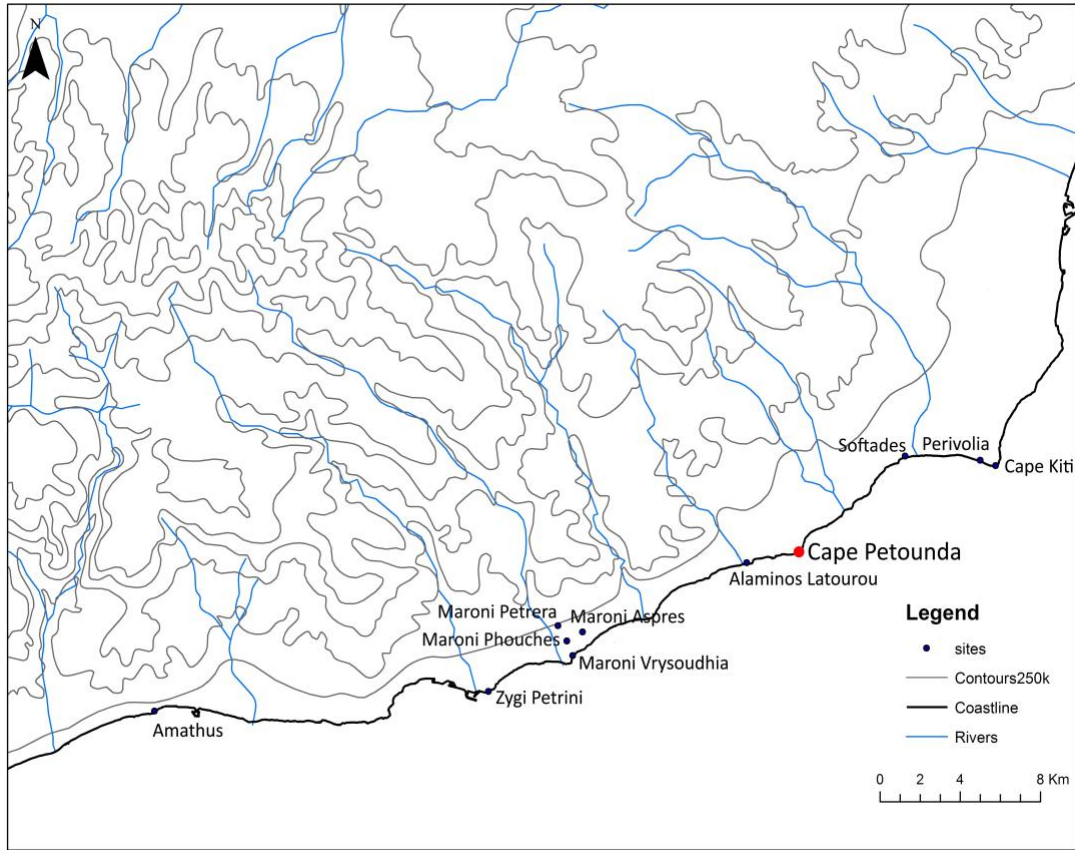


Figure 10: South coast of Cyprus from Amathus to Cape Kiti, marked with the Late Antiquity sites in the vicinity of Cape Petounda (map & GIS by Niki Kyriakou, University of Cyprus)

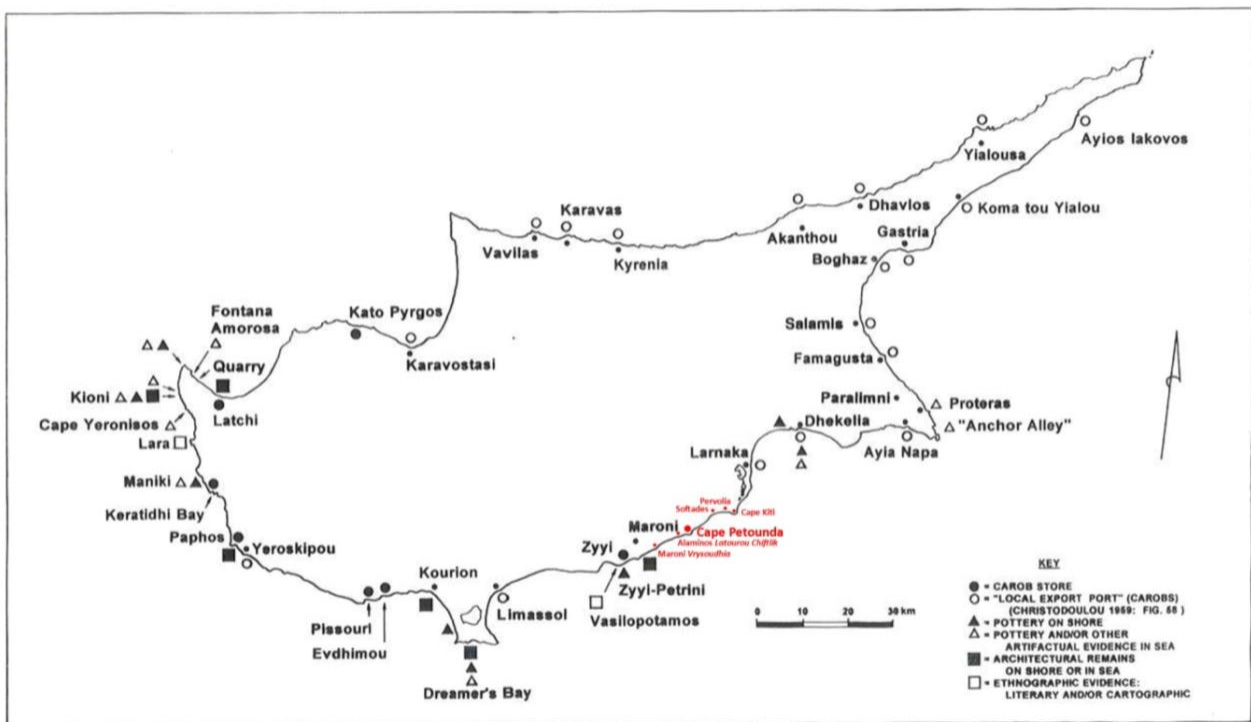


Figure 11: Map from a survey of Leonard of Roman ports-harbours-anchorage (Leonard, 1995:235, fig.7). The locations labelled in red are the more recently discovered Roman sites in the vicinity of Cape Petounda (editing Lefkothea Papakosta, University of Cyprus)

Table 1

Site toponym & region	One-hole	Two-hole	Three-hole	Unclassified	Total
Akrotiri, Limassol	4		1		5
Avdimou, Limassol	6		3		9
Ayios Philos (Philon), Karpasia	16		3	12	31
Ayios Photios, Apendrika (Ourania) & Khelones, Karpasia	3	1		17	21
Cape Andreas, Karpasia	27	1	6	9	43
Cape Kiti, Larnaca	21		4		26
Cape Pyla, Larnaca	1		1		2
Cape Greco, Famagusta	2		1		3
Dreamer's Bay, Limassol	5	1	3		9
Kerati (Keratidhi Bay), Paphos	1				1
Kition Workshop, Ancient Kition, Larnaca	9		1		10
Dhrousha Kioni, Akamas		1			1
Kouklia-Achni, Paphos	96		24		120
Lara Limnionas, Akamas	13		2		15
Lara South, Akamas	3				3
Maniki, Paphos	4		1		5
Maroni Tsaroukkas, Larnaca	25		10		35
Maroni Vrysoudhia, Larnaca					0
Maroni Yialos, Larnaca	4	3	4		11
Petounda, Larnaca	39	2	4		45
Salamis, Famagusta	1				1
Tochni, Larnaca	0	0	0		0
Famagusta Bay, Famagusta	1				1
Total	281	9	68	38	396

Table 1: Classification of Stone Anchors in Cyprus