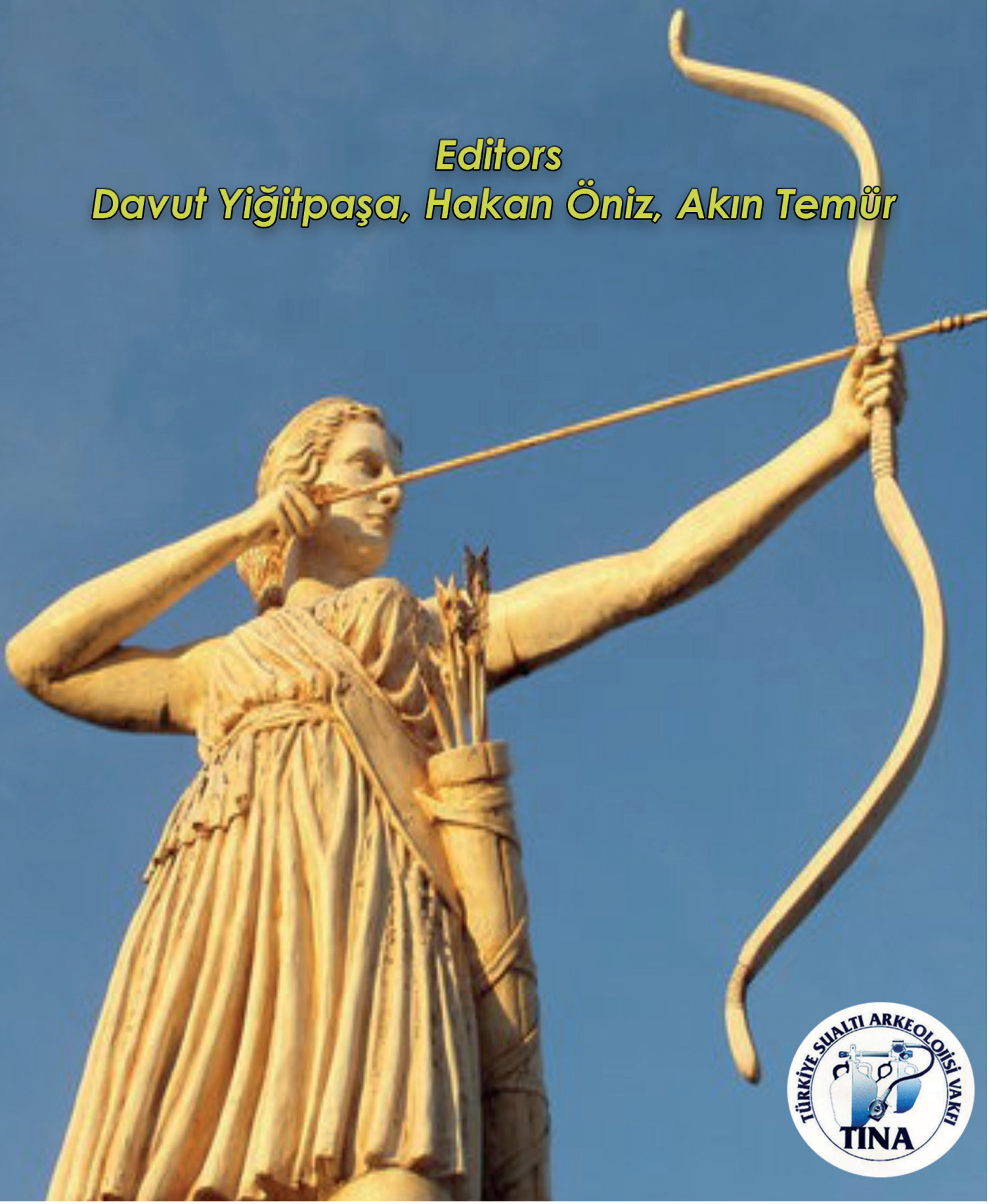
BLACK SEA ARCHAEOLOGY STUDIES
Recent Developments

Editors
Davut Yiğitpaşa, Hakan Öniz, Akın Temür



TÜRKİYE SUALTI ARKEOLOJİSİ VAKFI
TINA

BLACK SEA ARCHAEOLOGY STUDIES
Recent Developments

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CHAPTER 3: SETTLEMENT ARCHAEOLOGY

FOREWORD

The Black Sea studies in Turkey have not attained the desired level yet. The Southern Coast of the Black Sea has been neglected in terms of archaeological studies. Along the coast, the ancient cities have been overbuilt by modern settlements and recent road constructions have destroyed the ancient remains. All sites mentioned in ancient sources as the lands of the Amazons and other local tribes who lived in this region are still a legend only. Although there are some surveys and fieldwork being carried out by Turkish and foreign scholars, there still remains a lot to be done. Studies of the Black Sea cover a large area, and concern the study of different cultural complexes as reflected in different peoples, states and countries. This volume shows recent field projects and studies in the archaeology and ancient history of the Black Sea and their relationship with the Mediterrenean underwater studies. Opportunities, as offered by this volume, to exchange views and present new evidence, are crucial to the subject. The volume contains 22 papers from Turkey and other Black Sea countries, segregated in chapters of Excavations & Surveys, Settlement Archaeology and Underwater & Maritime Archaeology. It is an obligation to congratulate personally all writers, and thank them all for their studies and contribution to this publication. I also would like to thank Davut Yigitpaşa, Hakan Öniz, Akın Temür as editors for their contributions. I believe that the volume will provide support to the education of young scholars, and enhance the studies related with the Black Sea region.

Prof. Dr. Sümer Atasoy

FOREWORD

Black Sea has always been a marginal sea connected to an ocean which has many interesting features. The Turkish straits namely Bosphorus and Dardanelles connect the Black Sea to the Aegean Sea via Marmara Sea. Black Sea was sailed by Hittites, Carians, Colchians, Thracians, Greeks, Persians, Cimmerians, Scythians, Romans, Byzantines, Goths, Huns, Avars, Slavs, Crusaders, Venetians, Genoese, Tatars and Ottomans which makes it very rich historically. Deepwater archaeology shows that prehistoric settlements and ancient shipwrecks are exceptionally well preserved due to the absence of oxygen. TINA The Turkish Institute of Nautical Archaeology is proud and privileged to sponsor the 10th International Symposium on Underwater Research (ISUR), Black Sea Archaeology.

Oguz Aydemir
President of Turkish Foundation for Underwater Archaeology

CHAPTER 2

UNDERWATER & MARITIME ARCHAEOLOGY

Between the Danube Delta and the Black Sea: Preliminary Results of a Multi-Proxy Study of Two Archaeological Sites (Histria and Halmyris, Romania)

Alexandra BIVOLARU[1], Matthie GIAIME[2], Veronica ROSSI2, Valentin BOTTEZ[3], Nick MARRINER[4], Christophe MORHANGE[4], Vasilica LUNGU[5], Marius STREINU[5]

Abstract

This paper presents the preliminary results of the AMIDEX-GEOMED and COFUND geoarchaeological projects investigating ancient sites located on the Danube delta. The study is based on three cores. We compare and contrast bio-sedimentological analyses with archaeological data from two important sites: Histria and Halmyris. The aim of our project is to give a general overview of the environmental evolution and human impact between the Neolithic and the Classical Periods. Our research focuses on human settlement dynamics in relation to the evolution of the geomorphological context. The Danube Delta is a strategic interface, which has always provided access overland, as well as overseas. It is neighbored by the Black Sea to the East and is connected to Central Europe via the Danube valley. This important geographical corridor is essential for understanding the long-term evolution of Balkan civilizations.

Key Words: Geoarchaeology, ancient harbour, multi-proxy, Black Sea, Danube delta, Histria, Halmyris

1. Introduction

The Black Sea is the largest anoxic basin in the world, with a surface area of 423,000 km^2. Since *c* 9000 BP, the Black Sea has been reconnected to the Mediterranean, hence their water bodies respond synchronously to glacio-eustatic changes (Soulet *et al.* 2011). In the context of sea level stabilization since *c* 6000 BP, geomorphic and climatic phenomena such as deltaic progradation, floods, storms etc. have severely impacted the coastal system, and along with human interventions, had a strong influence on the deltaic environment. Understanding these climatic and geomorphological processes will help us to better understand the Danube delta's evolution and the history of different societies to these changes.

The Danube delta is one of the largest deltas in the world, and its geomorphological evolution a source of scientific debate. From the beginning of the 20th century (Antipa 1914), the delta was divided into two distinct units: the western fluvial delta and the south-eastern maritime delta (Figure 1). Deciphering their dynamics is essential for our research, since Halmyris is located in the fluvial unit, while Histria is in the maritime realm. Recent work by Vespremeanu-

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Stroe *et al*. 2016 minutely reconstructs the evolution of the delta, giving new insights into its chronology and development. For the fluvial delta, the authors emphasize two phases, which span the period between 8000/7500 BP to 5500 BP and consist of the delta front advancing into the Danube bay, followed by fluvial aggradation (Vespremeanu-Stroe *et al*. 2016). The maritime unit appeared when the Danube delta entered under the direct morphogenetic action of the swell and near shore currents, *c* 6000 BP, creating a landscape dominated by open-coast deltaic lobes (Panin 2003, Vespremeanu-Stroe *et al*. 2016).

Tracking the evolution of the Danube delta is crucial in the context in which this landform was inhabited constantly since the Neolithic Period, even though traces of human activity date back to the Upper Palaeolithic Period. The spatial distribution of human settlements, reflected in their internal development, as well as in their rise and decline, is an indicator not only of the delta's morphogenesis, but also constraints and potentialities of these areas. The fluvial and deltaic sediments are rich archives (bio- indicators, macro-remains, artifacts, etc.) that, when corroborated with archaeological data, allow reconstruction of the landscape history.

The stratigraphic sequences in coastal environments comprise, in many places, a clearly identified anthropogenic signature, notably in ancient harbours. In open beach contexts, a distinct sedimentary suite differs from the natural aggradational sequence for maritime harbours. The harbour sequence is characterized by low-energy silts and associated lagoon fauna (defined as the Ancient Harbour Parasequence), as opposed to the gradual upwards-coarsening sequence specific for a 'natural' progradation (defined as Coastal Progradational Parasequence). Thus, the artificially protected harbour structures create rich archives, typical of anthropogenically-modified sedimentation (Marriner and Morhange 2006, 2007; Marriner *et al*. 2016).

Within this framework, our work aims to decipher the historical development of the ancient harbours of Halmyris and Histria in the context of the geomorphological evolution of the deltaic environment, whereas the degree of technical development translates their capacity to adapt to rapidly changing environments. We must consider, therefore, that Halmyris is in a proximal position (near the Saint George fluvial branch), while Histria lies in a more distal area (southernmost margin of the Danube delta, at the southern end of the sedimentary cell).

2. Methodology

Our work is based on the analysis of three long, continuous cores (one at Halmyris; Figure 3 and two at Histria; Figure 5). GPS data were collected to record their coordinates. Each core was described and sampled directly at the investigated site. For a high-resolution analysis, each core was sampled with a resolution of between 5 to 10 cm., depending on the collected sediment. The samples were analyzed at the CEREGE laboratory according to the methodology established by Marriner and Morhange (2007) and Marriner (2009).

The multi-proxy approach implied an analysis of the biological indicators, such as mollusks and ostracods, as well as sedimentological proxies (granulometry and sediment texture). Core stratigraphies were divided into homogeneous units and dated.

The ^{14}C dating was performed at the Poznan Radiocarbon Dating Centre. Conventional radiocarbon ages were calibrated using the IntCal 13 and Marine13 curves (Reimer *et al*., 2013; Figure 2). From the total of performed AMS radiocarbon determinations, six dates were retained for Halmyris and other six for Histria; the others were rejected because of possible

reworking. The sampled material comprises vegetal remains, charcoal and fresh-water shells for Halmyris, and marine shells for Histria. The local marine reservoir age used is 498 ± 41 BP (Siani *et al*. 2000).

3. Halmyris - a Roman fort on the Saint George branch

Historical and archaeological contexts

The ancient fort of Halmyris is located on the Northern part of the Dunavăț promontory and faces the St. George arm, the oldest branch that has had an uninterrupted flux over the last 8000/7500 years (Vespremeanu-Stroe *et. al* 2016). Access to the settlement was possible via the St. George's and the Dunavăţ's branches. The ancient history of Halmyris is divided into three main occupation phases (Suceveanu *et al.* 2003).

The oldest traces of occupation are dated to the 4th c. BC, when the Getae population settled on the site of the future fort. Notwithstanding this, the oldest sherd discovered on the site dates to the 6th c. BC, typologically belonging to the Middle Style II bowl of the Oriental style (Suceveanu and Angelescu 1988; Zahariade and Karavas 2015). The uppermost archaeological layer corresponds to the period between the 4th – 3rd c. BC, while the layer that follows corresponds to the dwelling level dated to the 2nd – 1st c. BC, and can possibly be related to a *dava*, a fortified Getae settlement. Regarding the settlement type, researchers (Zahariade 1991; Suceveanu *et al.* 2003; Zahariade and Karavas 2015) suggest that pre-Roman Halmyris could have been an *emporion*, integrated in the *chora* of Histria or, more probably, in that of Orgamè. The authors base their hypothesis on the toponymy (Halmyris is possibly a Greek name, related to the ancient homonymic gulf, which could mean salt water; for the toponymic discussion also see Suceveanu, Zahariade, 1987; Suceveanu *et al*. 2003; Zahariade, Alexandrescu 2011; Zahariade, Karavas 2015) and the Greek pottery discovered (especially amphorae from Chios, Chersonessos and Thassos). Even though the hypothesis of a Greek foundation where the Getae mixed with the Greek element is plausible, there is not sufficient archaeological data to unequivocally support it.

During the Early Roman Period (1st – 3rd c. AD), Halmyris played an important strategic role. Initially an earth-fortification (last quarter of the 1st c. AD), Halmyris was rebuilt in stone during the 2nd c. AD as a fort. The newly-built fort played an important role in controlling the last segment of the Roman Limes on the Danube, overseeing the territory between Aegyssus (Tulcea) and the mouth of the St. George arm (Suceveanu *et al*., 2003).

The most important discoveries dating from this epoch are eight inscriptions in which a *vicus classicorum* is mentioned (Suceveanu and Zahariade 1986; *AÉ* 1988 987; Zahariade and Alexandrescu 2011, 29–30, no. 6; Matei-Popescu 2016, 217-220). The date of the inscription (2nd – 3rd c. AD) suggests that in this period, the naval base of the *Classis Flavia Moesica* (the fleet organized by Emperor Vespasian) was located near Halmyris.

The last phase of occupation covers the interval between the last quarter of the 3rd c. AD and the 3rd or 4th decades of the 7th c. AD (Suceveanu *et al*., 2003). During the Late Roman Period, the military character of Halmyris was mixed with civilian dwellings, given the apparition of constructions such as *thermae*. Regarding the harbour, an ancient text (Zos. IV, 10) informs us about Halmyris being a point of transfer from large maritime vessels to fluvial ones. Moreover, considering the conflicts with the barbarians during the 5th c. AD, archaeologists take into account the possibility of the fort also having a military harbour (Suceveanu *et al*., 2003).

The abandon of the fort during the first half of the 7th c. AD is related to several aspects. First of all, the change in the composition of population, attested by the Slavic pottery, indicates a phase of socio-political instability (Zahariade and Phelps, 2002; Suceveanu *et al*., 2003) that is nevertheless characteristic of the entire Scythia Minor during this period (Suceveanu, Barnea 1991). This instability is also perceivable in the decline of urban life, as, at this time, the habitat consists of dugouts built of *spolia* from previous structures (Zahariade and Karavas 2015). As we will see below, we can link these factors with the geomorphological changes which took place during the 7th c. AD.

Palaeo-environmental analysis

Halmyris is presently landlocked and located on top of low-lying relict cliffs of the ancient Holocene Danube ria. The present-day St. George mouth is located approximately 40 km. east of Halmyris.

The geoarchaeological research had two main aims: (1) to understand the palaeo-environmental evolution during the last 7500 years; and (2) to identify the harbour's location (Magne 2016, Giaime 2016). In this respect, two cores were analysed in proximity to the site, the most interesting results being offered by core HA III (Figure 4). Located 100 m in front of the fort's northern gate, core HA III has a length of 575 cm. and records Mid- to Late-Holocene sedimentary sequences.

The bio-sedimentological analyses of core HAIII shows five main environments which translate a classic regressive sequence dominated by a marine environment at the base of the core, superposed by fluvial sediments (Figure 4). Starting with the 5th mil. BC, the fluvial progradation led to the development of a floodplain characterized by an amphibious environment, as shown by the organic peat layers recorded in the core and dated between 5210 ± 40 yrs. cal. BP and 3920 ± 35 yrs. cal. BP (Giaime 2016). At the top of the peat layer, we identified a sedimentary sequence consistent with a relatively calm freshwater body. The freshwater ostracod species can be divided in two groups (continental stagnant waters and running water). This group is composed by *Darwinula stevensoni* and *Physocypria kraepelini* that are characteristic of river-bed interstitial sand in secondary channels (Szlauer-Lukaszewska, 2013). This ecological assemblage reflects the presence of a calm channel between *c* 2400 yrs cal. BC and *c* 600 yrs AD, which means that it gently flowed in front of the northern gate of the ancient city. The water depth of this channel was estimated ca 150 +/-30 cm. between *c* 2400 BC and *c* 600 AD (after Vacchi, personal communication).

Questions on the possible harbour location

The palaeo-environmental analysis allows us to affirm the presence of a shallow fluvial channel in the northern part of the site (Figure 4), as postulated by archaeologists before (Suceveanu *et al*. 2003). We could assume that during the Roman Period (1st c. AD – 7th c. AD) the channel could have been used as a natural anchorage. At present, no archaeological structure related to the harbour has been identified, but human intervention in order to maintain the channel navigable could be speculated from chronological inversions recorded in unit E, core HA III. The harbour's confinement due to the disconnection between the secondary channel and the main channel of the St. George is contemporaneous with the abandonment of Halmyris during the 7th c. AD. Nevertheless, the question of whether the harbour's closure was led to the city's abandonment or if it was due to the abandonment of the harbour because it was no longer used is unclear.

4. Histria - a city on the Southern margin of the delta

Geomorphological context

The ancient city of Histria is located on the southern margin of the Razelm-Sinoe lagoon system. This area is defined by the existence of many geomorphological units, namely two major beach ridge plains (Saele, where Histria is located, and Chituc), sandy barriers (Lupilor) and shallow lakes (Sinoe on the E, Istria and Nuntași on the W) interconnected by natural and artificial channels. The main sedimentary input came from St. George's branch, via the Dunavatz and Dranov channels which, before their artificialization in 1912, represented its secondary distributaries (Antipa 1914; Hanganu 2012, 24; Vespremeani-Stroe *et al.* 2013, 248).

The intense coastal progradation of the region due to the proximity of the Danube, along with the long shore currents, lead to the formation of the Saele beach ridge plain, with a maximum length of 9.5 km. and a width of 3 km. The older unit, Saele West (Vechi) is OSL dated to 5000 – 2730 cal. BP (Hanganu 2012; Preoteasa *et al.* 2013; Vespremeanu-Stroe *et al.* 2013; Vespremeanu-Stroe *et al.* 2016) and connects the green schist palaeo-island (where Histria's acropolis is located) to the continent. The existence of this coastal plain before the foundation of the city by the Milesians in the second half of the 7th c. BC is also supported by archaeological data, because we have dwelling structures from the Archaic Period (end of 7th – 5th c. BC) built directly on the sand in this area, called the Western Plateau (Dimitriu 1966, 27-37).

Historical and archaeological overview

The continuous occupation during almost 1300 years can be grouped into five main archaeological periods: (1) the Archaic Period (7th – 5th c. BC); (2) the Classical Period (5th – 4th c. BC); (3) the Hellenistic Period (4th – 1st c. BC); (4) the Early Roman Period (1st – 3th c. AD); and (5) the Late Roman Period (4th – 7th c. AD) (Angelescu, Bâltâc 2002-2003). Since its foundation, the city comprised two nuclei, the acropolis and the western plateau.

For the Archaic Period, there are dwelling levels on the acropolis, where the Sacred Area is located (Alexandrescu 2005, Avram *et al.* 2013), as well as on the western plateau, where habitation structures were discovered (Dimitriu 1966). Along with these, a segment of the Archaic defense wall was discovered on the western part of the plateau (Suceveanu 2005) while, in the centre and in the southern part of the acropolis, structures dating from this epoch were also identified (Bottez 2015). An interesting remark concerning the spatial distribution of the archaeological features of the Archaic Period is their absence over a 450 m distance between the Classical defense wall and the western plateau.

The Classical Period is characterized by a flourishing economy, considering that around 450 BC, Histria started to mint its own coin (Talmațchi 2011, *passim*). Among the previous dwelling spots, we encounter new ones on the western plateau, as well as a new defense wall for the Acropolis which encompasses a larger surface than the Archaic one; also, there is some evidence for the existence of a second defense wall, intended to protect the Plateau (Angelescu 2003-2005, 84).

Beginning in the 4th c. BC, the double defense wall system was implemented at Histria, one for protecting the acropolis and which enclosed a *c* 10 ha surface, and another which follows almost the same trajectory as the Archaic one (Angelescu 2003- 2005, 70). The Hellenistic Period was unfortunately marked by geopolitical instability. The city was engaged in local conflicts (the war between Scythians north of the Black Sea and southern Thracians), as well

as in regional ones (the wars between Hellenistic kingdoms) (Pippidi 1967). The Early Roman Period marks the end of Histria's autonomy. In spite of this, the city became prosperous once again in the 2nd c. AD, as demonstrated by the archaeological material. Another defense wall was built, west of the Hellenistic one, while the Sacred Area was abandoned and over it a residential district was raised (Avram *et al.* 2013). Furthermore, during this period, the city received two bath complexes (Suceveanu 1982), as well as the civil basilica from the agora. After the period of stability ensured by Emperor Trajan, Histria was confronted with increased barbarian pressure starting with the Marcomanic Wars during the reign of emperor Marc Aurelius. The peak of this conflict was during the second half of the 3rd c. AD, when a Gothic invasion caused the city's most violent destruction – (SHA, *Max. Balb.* 16, 3 mentions the *excidium Histriae*) (Doruțiu-Boilă 1985, 133-134).

The last phase of occupation corresponds to the Late Roman Period. After the 3rd c. AD destruction, a new defense wall was built – the last one –, which enclosed a surface of *c* 7 ha. A last period of prosperity is attested archaeologically during the 6th c. AD (Suceveanu 2013); following this, the final decline of the city started, ending with its abandonment during the first half of the 7th c. AD, after 1300 years of uninterrupted occupation.

Geoarchaeological research – Identification of a possible harbour?
Our work at Histria was concentrated in the NW part of the city (*Sărătură* site, Figure 5) and sought to answer two main questions: (1) how did this area evolve from a geomorphological point of view? and (2) was this area suitable for an anchorage/harbour activities? For our study, four cores were drilled in the centre of the site and in its proximity, with the most interesting results being observed in cores HIS I and HIS III.

Regarding the geomorphology of the Histrian region before the foundation of the city, our cores indicate a connection between the palaeo-island of Histria and the continent.

According to the stratigraphy of cores HIS I and HIS III, we observed an evolution from an open marine environment to a lagoonal one *c* 2000 BC (Bivolaru 2016). Although chronology needs to be reinforced, the stratigraphy obtained in core HIS I was extremely interesting, as we have two main units: the one at the base, dated to the period before the city's foundation, indicates a protected lagoon environment (2456 - 2142 cal. BC), which started to communicate with the sea around 2280 - 2035 cal. BC, more than one millennium before the foundation of Histria. The bio-sedimentological assemblage of unit B was interpreted as possibly corresponding to the functioning of the ancient harbour (Bivolaru 2016).

A better chronostratigraphic framework was identified in core HIS III (Figure 6). The bio-sedimentological analysis shows a geomorphological evolution from an open marine environment (1488 - 1216 cal. BC) to an open lagoon around 394 - 307 cal. BC (Bivolaru 2016), with the onset of a protected environment, characterized by the deposition of silts and clay in unit B. Radiocarbon dating is confirmed by pottery finds from the core, which were also dated to the Hellenistic Period. The bio-sedimentological sequence identified here is possibly characteristic of a harbour basin. It consists of a unit which records an abrupt siltation (HIS III, unit B) above a coarse deposit (HIS III, unit A). The malacological assemblage and the ostraco-fauna of unit B are similar to that corresponding to an open lagoon, with species such as *Cerastoderma edule* for mollusks and *Cyprideistorosa* for ostracods being recorded. Furthermore, the chronological inversion recorded at the top of this unit could be an indication for possible dredging in order to maintain the harbour functional.

Therefore, at Histria, we may have a first phase of anchorage on a pocket beach during the Archaic Period (following HIS III data), followed by a lagoonal (artificial?) basin starting with the Hellenistic Period in the central-northern part of the site. An important argument in support of our hypothesis is the preliminary geophysical investigations undertaken by Höckmann (1996 and 1998) (Figure 7). In 1996, geo-electrical research undertaken in the so-called *Sărătură* site, where core HIS I is located, led Höckmann to interpret this spot as a narrow gulf which could have served as a natural anchorage (Höckmann *et al.* 1996-1998, Höckmann 2001). Important results were also obtained in 1998, when a sonar investigation was undertaken on Lake Sinoe. In the western part of the lake, archaeological structures as well as a ditch 150 m long and oriented WNW-ESE were detected, which on its E extremity turns in an obtuse angle towards the E for another 60 m; all these structures were identified under the bottom of the lake (Höckmann *et al.* 1996-1998, Höckmann 2001). On the eastern extremity of the initial segment, two parallel ditches were identified; another is oriented E-W (Höckmann *et al.* 1996-1998, Höckmann 2001). The same extremity meets a curved bed, called 'The Plateau Channel', which has structures from an unknown period identified on its banks (Höckmann *et al.* 1996-1998, Höckmann 2001). The whole assembly (Figure 7) was interpreted as a possible northern extremity of the *Sărătură* gulf (Höckmann *et al.* 1996-1998, Höckmann 2001).

Moreover, the existence of a harbour basin during the Hellenistic Period is attested by a series of epigraphic monuments discovered on the site, which mention the port. Among them is a series of proxeny decrees that attest to the presence of a harbour, the oldest of which dates to the 5th c. BC (Avram 2000 = *SEG* 50 681 = *BÉp.* 2004 228, Avram 2007 no. XXXI, Cojocaru 2016, no. 8(1)). Equally interesting for our research is an inscription initially dated to the 2nd c. BC (*ISM* I 64), but more recently re-dated to the middle of the 3rd c. BC (see Avram 2007, no. 64 for Ju. G. Vinogradov' comment) that mentions a Histrian fleet which helped Apollonia Pontica (Sozopol, Bulgaria) in its war with Messambria (Nessebar, Bulgaria). In addition, another epigraphic monument from the 3rd c. BC (*ISM* I 112, Avram 2007, no. 112, Alexandrescu-Vianu 200 no. 178) makes a brief reference to a possible Histrian fleet. This is very important for the investigation of the harbour of Istros, as the existence of a fleet implies the presence of certain harbour constructions, such as naval structures necessary for maintaining an operational fleet (Blackmann *et al.* 2013).

5. Conclusions and perspectives

Our research offers new insights regarding the palaeo-environmental evolution of Halmyris and Histria, two ancient settlements of the Danube delta. We focused on the search for the harbours or anchorages at each site.

At Halmyris, located on the fluvial part of the delta, our investigations reveal the presence of a secondary channel of the St. George in proximity to the city. According to our bio-sedimentological analyses, this channel flowed north of Halmyris between the 3rd m. BC and the 7th c AD and may have been used as a natural harbour during the Roman Period. Even if the disconnection between the secondary channel and the St. George arm of the Danube is contemporaneous with the abandonment of Halmyris by the Romans, in the present state of research we cannot affirm that this context is responsible for the abandonment of the site. In fact, the 7th c. AD marks the beginning of a period of disequilibrium at the frontier of the Empire that forced the Romans to abandon a large number of cities in Scythia Minor and eventually led to the fall of the Danubian limes (Suceveanu, Barnea 1991). Therefore, it could be that the departure of the population resulted in the rapid infilling of the harbour.

For Histria, located on the southern margin of the maritime delta, we observe a transition from an open marine environment to an open lagoonal one around 394 - 307 cal. BC (dating to be confirmed). Our multi-proxy approach led us to hypothesize the presence of a primitive anchorage on a pocket beach during the Archaic Period, followed by the construction of a basin at the beginning of the Hellenistic Period in the central- northern part of the site. As in the case of Halmyris, we cannot clearly determine at this moment if the abandonment of the city is also related to the loss of harbour facilities due to the emergence of the Chituc – East Saele beach ridge plains starting with 1400 BP (Vespremeanu-Stroe *et al*. 2016), apart from the already mentioned socio-political factors.

Nevertheless, our preliminary results will be completed with new bio- sedimentological data, as well as with radiocarbon datings, in order to offer a more solid reconstruction in the future. Moreover, the data will be cross-checked with geophysical and archaeological investigations, in order to identify possible structures related to the harbour basin (Histria) or the channel respectively (Halmyris).

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Figures:

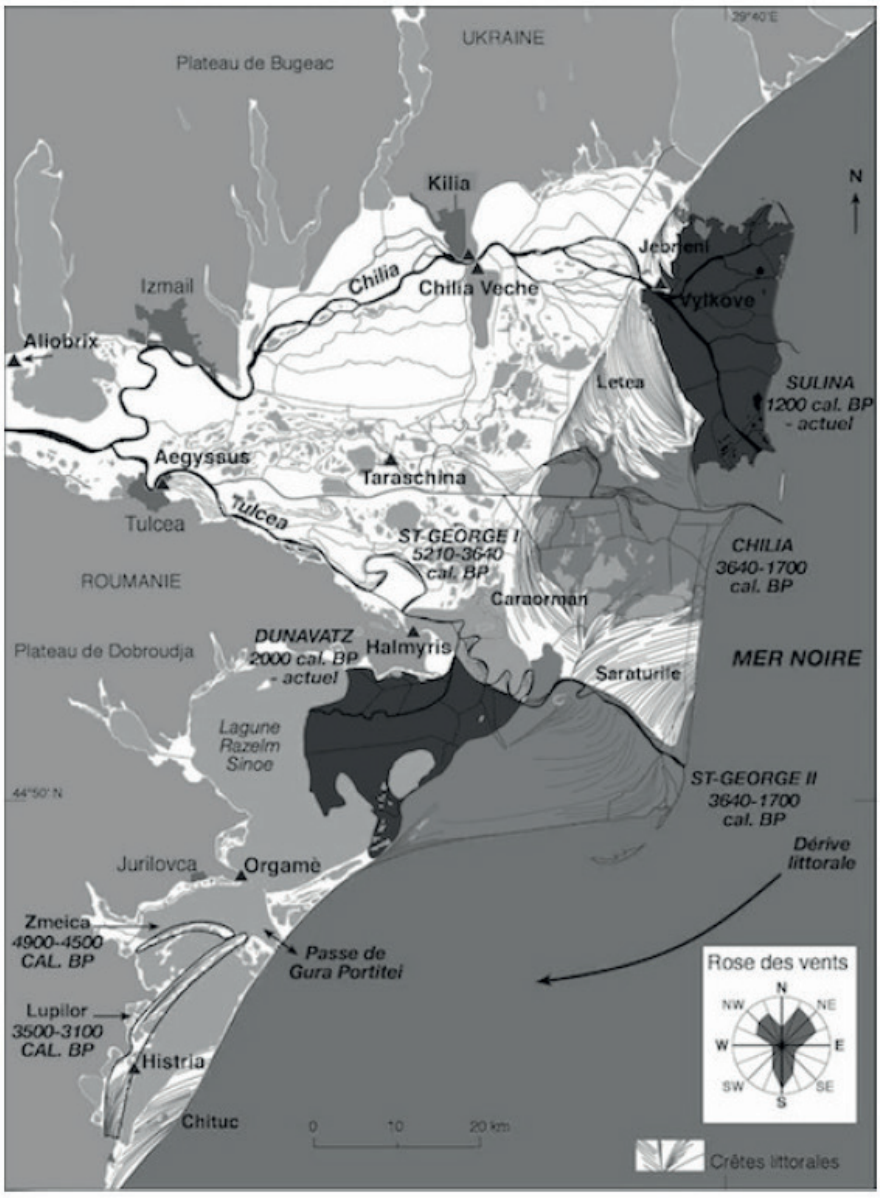


Figure 1: TheDanube Delta: The geomorphological map and localization of the main archaeological sites

Sample	Lab number	Material	Depth (cm b.s.)	Depth (cm b.s.l.)	Age 14C	2 sigma BP min; max	2 sigma BC/AD min; max	Status
HAIII(60-63)	Poz-81693	Peat	60-63	60-63	1230 ± 30 BP	1069 ; 1261	689 ; 802 AD	Rejected
HAIII(120-125)	Poz-79633	Plant remains	120-125	120-125	830 ± 30 BP	688 ; 789	1161 ; 1262 AD	Accepted
HAIII(245-250)	Poz-81694	Organic sediment	245-250	240-245	1930 ± 30 BP	1820 ; 1946	4 ; 130 AD	Rejected
HAIII(270-275)	Poz-79655	Charcoal	270-275	270-275	1775 ± 30 BP	1611 ; 1812	138 ; 339 AD	Accepted
HAIII(275-280)	Poz-81695	Charcoal	275-280	270-275	2585 ± 35 BP	2510 ; 1770	821 ; 561 BC	Rejected
HAIII(300-305)	Poz-79656	Charcoal	300-305	300-305	3920 ± 35 BP	4242 ; 4496	2547 ; 2293 AD	Accepted
HAIII(355-360)	Poz-79657	Peat	355-360	355-360	4425 ± 35 BP	4871 ; 5276	3327 ; 2922 BC	Accepted
HAIII(405-410)	Poz-81696	Peat	405-410	405-410	5210 ± 40 BP	5903 ; 6174	4225 ; 3954	Accepted
HAIII(470-480)	Poz-79659	Organic material	470-480	470-480	5125 ± 35 BP	5749 ; 5939	3990 ; 3800 BC	Rejected
HAIII(530-540)	Poz-79164	Freshwater shell	530-540	530-540	7170 ± 40 BP	7877 ; 8104	6155 ; 5928 BC	Accepted
HIS-I-2(168-169)	Poz-78016	Organic material	168-169	168-169	4230 ±35 BP	4630 ; 4762	2911; 2681 BC	Rejected
HIS-I-4(496-500)	Poz-78019	Organic material	496-500	496-500	3745 ± 35 BP	3984 ; 4229	2280 ; 2035 BC	Accepted
HIS-I-5(563-567)	Poz-7820	Organic material	563-567	563-567	9520 ± 50 BP	10609 ;11089	9140 ; 8660 BC	Rejected
HIS-I-6(1)(640-650)	Poz-78021	Organic material	640-650	640-650	3820 ± 35 BP	4091; 4405	2456 ; 2142 BC	Accepted
HIS-I-6(2)(640-650)	Poz-78333	Marine shell (Abra alba)	640-650	640-650	3110 ± 30 BP	2503 ; 2847	898 ; 554 BC	Rejected
HIS-III-2(190-200)	Poz-78022	Organic material	190-200	90-100	2305 ± 30 BP	2184 ; 2357	408 ; 235 BC	Accepted
HIS-III-3(316)	Poz-78023	Organic material	316	216	2150 ± 30	2009 ; 2305	356 ; 60 BC	Accepted
HIS-III-3(355-365)	Poz-78025	Organic material	355-365	255-265	2250 ± 30	2156 ; 2343	394 ; 307 BC	Accepted
HIS-III-3(370-380)	Poz-78338	Marine shell	370-380	270-280	3585 ± 30	3165 ; 3437	1488 ; 1216 BC	Accepted

Legend: B.S.: below surface b.s.1: below sea level
Figure 1: TheDanube Delta: The geomorphological map and localization of the main archaeological sites

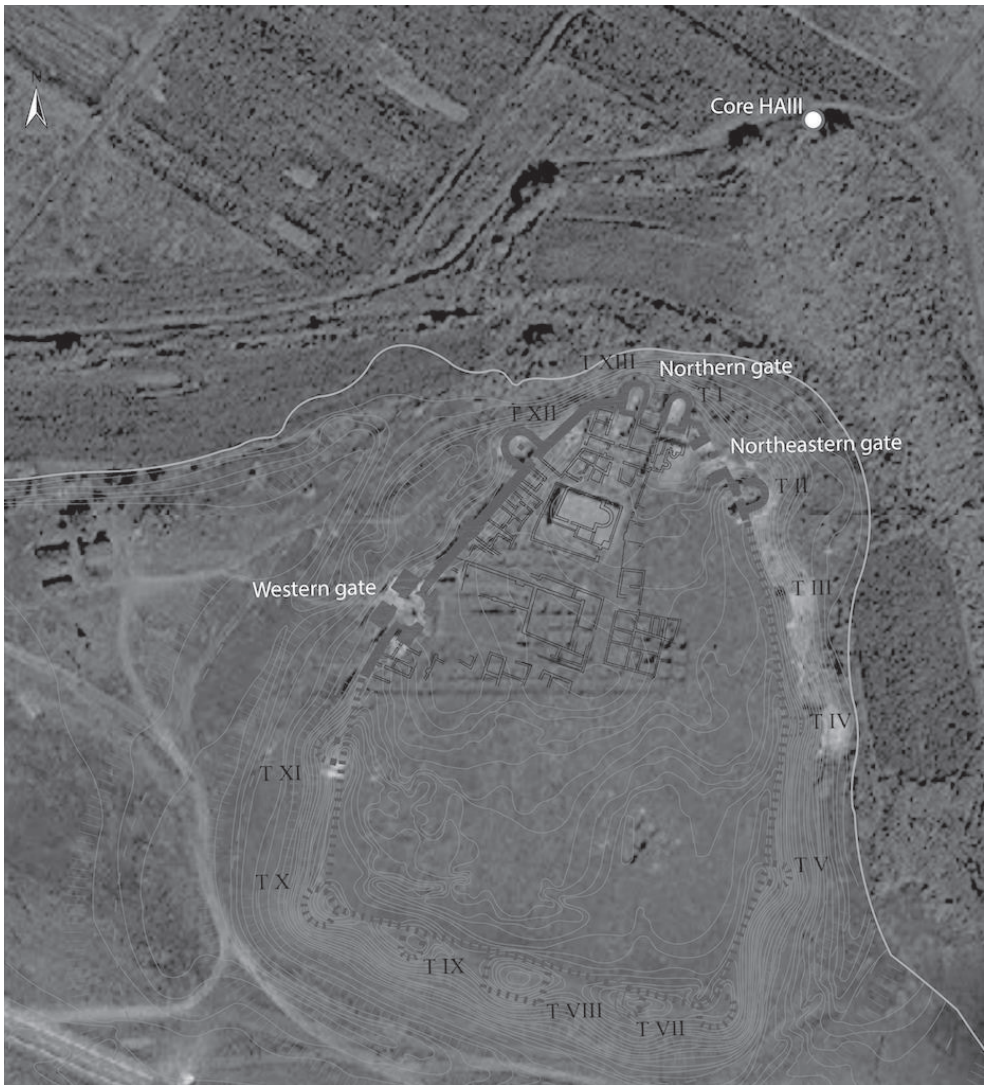


Figure 3: Halmyris: A general plan of the Roman fort and position of the core HA III.

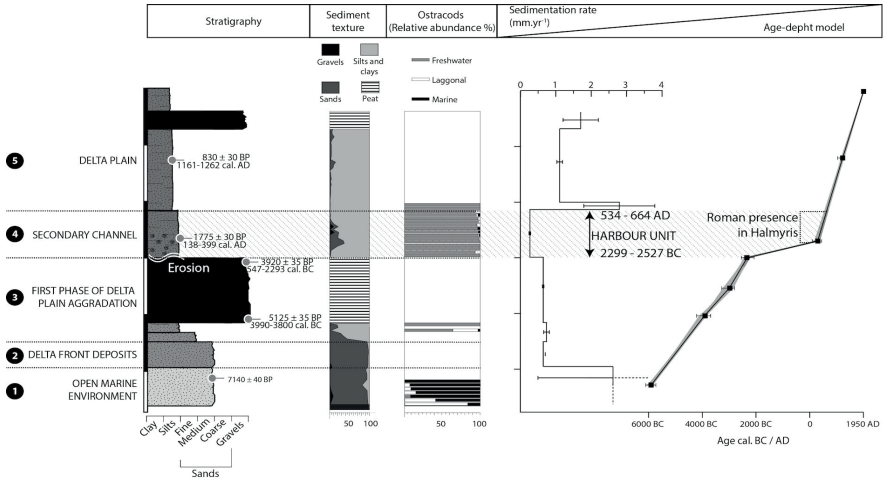


Figure 4: Halmyris: A general plan of the Roman fort and position of the core HA III.

Figure 5: Halmyris: An age-depth model for the core HA III. The highlighted unit is the possible harbour (Giaime 2016).

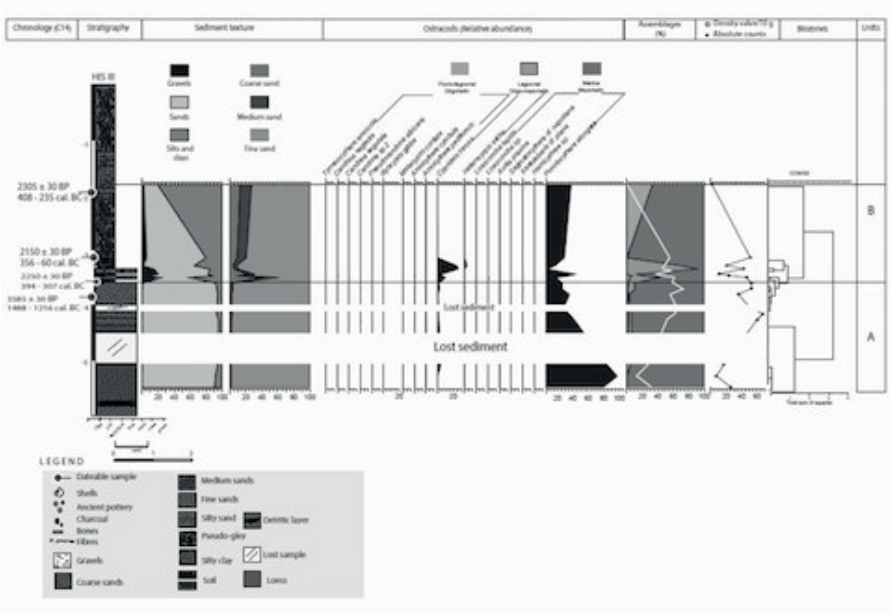


Figure 6: Histria: A general plan of the archaeological structures and position of the cores HIS 1 and HIS III.

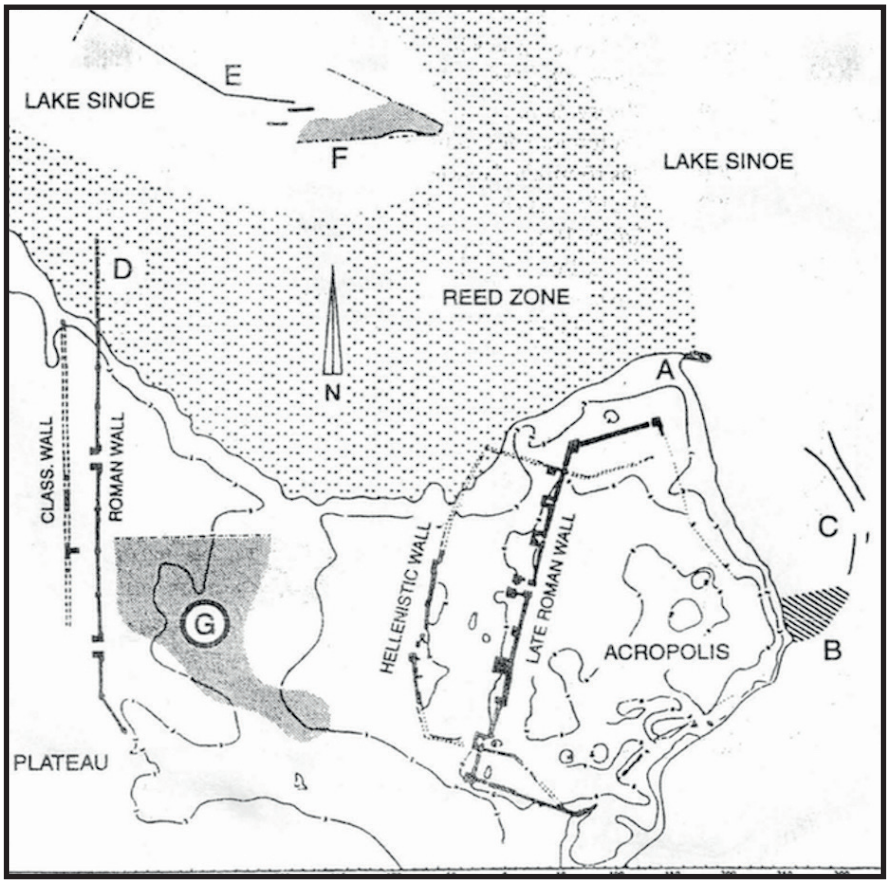
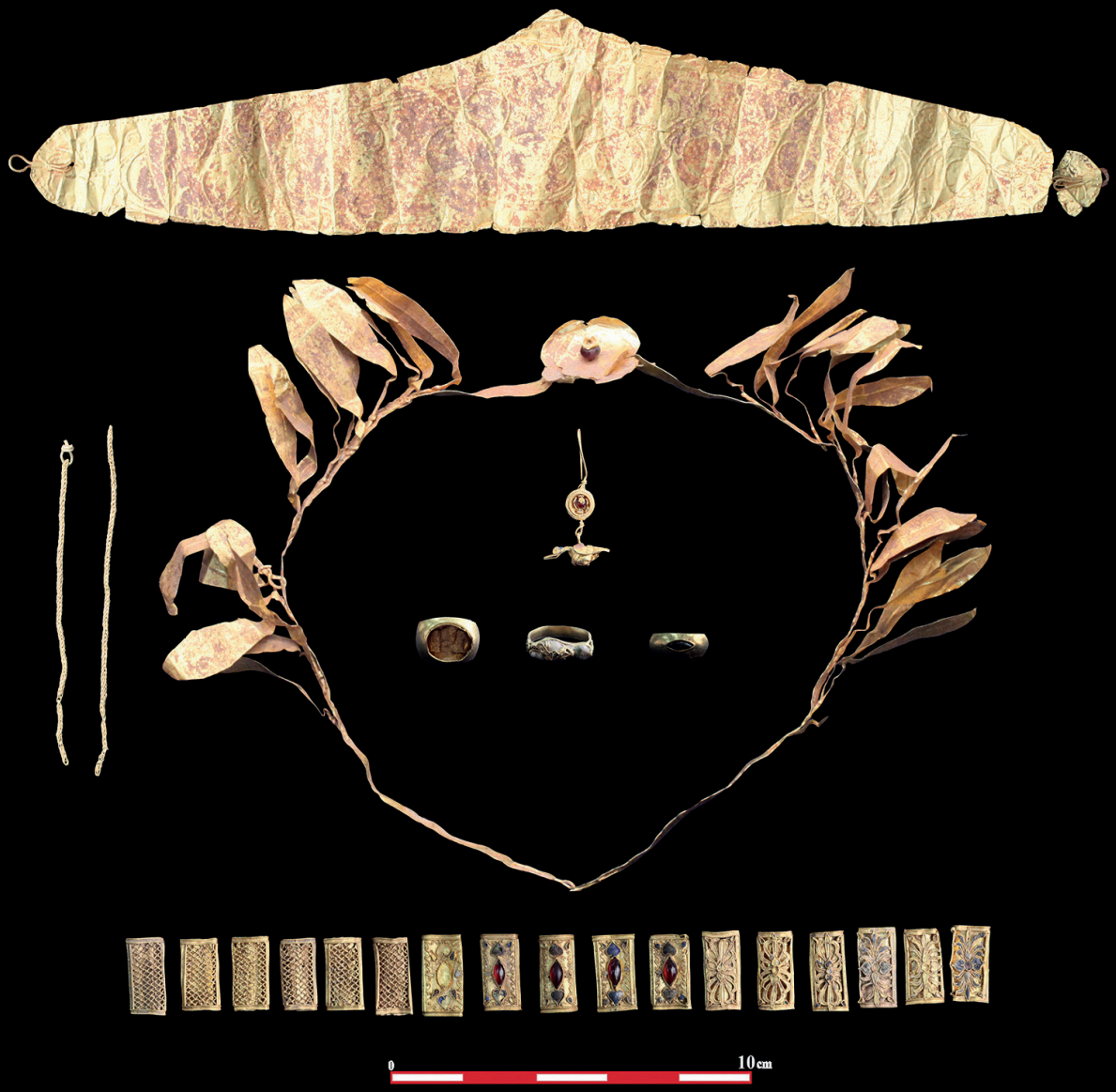


Figure 7: The results of Hookmann's geophysical investigations: A. the cove (*'Fisherman point')*; D. Submerged part of the Early Roman defence wall; E. Submerged archaeological structures*; F. Plateau channel with fortification (?) on its southern site; G. The Gully harbour. After Hookmann 2011, 178. *noted as *'fortification (?)'* by Hookmann.



Hellenistic Remains from Samsun - Photo: Akın Temür