

## The Phoenicians and the Ocean: trade and worship at La Caleta, Cadiz, Spain

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The area of La Caleta, north-west of Cadiz, is a key location for studies of the relationship between the Phoenician city of Gadir and the ocean. The port channel and the small islets that characterize the area was one the busiest sectors of the city, and there are abundant underwater remains attesting to past commercial activities. The area also had an important religious role: two sanctuaries were located at the western end of the rocky promontories that surround the channel, and many items identified as offerings have been found. This article synthesizes previous research and provides an overview of the results of a recent project (2008–2010), which enables a thorough review of the development of the seascape and its use during the 1st millennium BC.

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According to certain literary and historiographic traditions, the Phoenician foundation of Gadir occurred during the early stage of Phoenician expansion in the Western Mediterranean. From the start the city appears to have been one of the main places of settlement for Eastern colonists who were endeavouring to open new routes towards the Atlantic Ocean.

Archaeological research carried out in the Bay of Cadiz over the past few decades has confirmed the important role played by the Phoenician presence on the islands of Cadiz—from Cadiz itself to the area of Sancti Petri—and at the mouths of the main rivers. Also, both archaeological and Classical literary sources indicate that the city was from its earlier stages intimately connected with the sea, through activities such as fishing, salt extraction, and maritime commerce. This relationship became stronger over time until it reached its peak with the Balbo family during the Roman-Republican and the Early Imperial periods (Botto, 2014; Sáez Romero, 2014; Niveau, 2015).

The evidence available for Phoenician settlement in the bay and for its maritime projection is still incomplete, although it seems clear that the northern area of the island of Cadiz was occupied by a small settlement, and that its southern end was chosen for the construction of a sanctuary devoted to

Melqart. Probably, the Phoenicians also contributed and populated fortified settlements in Castillo de Doña Blanca (Ruiz and Pérez, 1995) and Cerro del Castillo (Bueno, 2014), at the mouths of the rivers, and rapidly extended their economic and commercial activities upriver into the main valleys (Fig. 1a). The Orientalization of the material culture and the settlement patterns in the bay is obvious by the 7th century BC (Niveau, 2015). At the same time, maritime activity geared towards the Atlantic and other Western Phoenician settlements intensified. It seems that in the 7th and 6th centuries BC, Gadir was consolidated as a political and economic centre, gained control over the hinterland, and grew in international prestige, wealth and influence as a result of a strategy of increased maritime commerce. The bay thus entered a period of expansion, the archaeology of which remains only partially known (Botto, 2014).

During the Punic period, between the late 6th and the early 3rd centuries BC, the bay underwent substantial demographic and economic growth. In the 5th century BC the city's salted fish became internationally known; the archaeological and written sources indicate that it was in high demand in Greece (Zimmerman-Munn, 2003). In contrast with the renown of these preserves, the information available concerning harbour facilities, shipyards and fleets is scarce (Fig. 1b). In any case, these

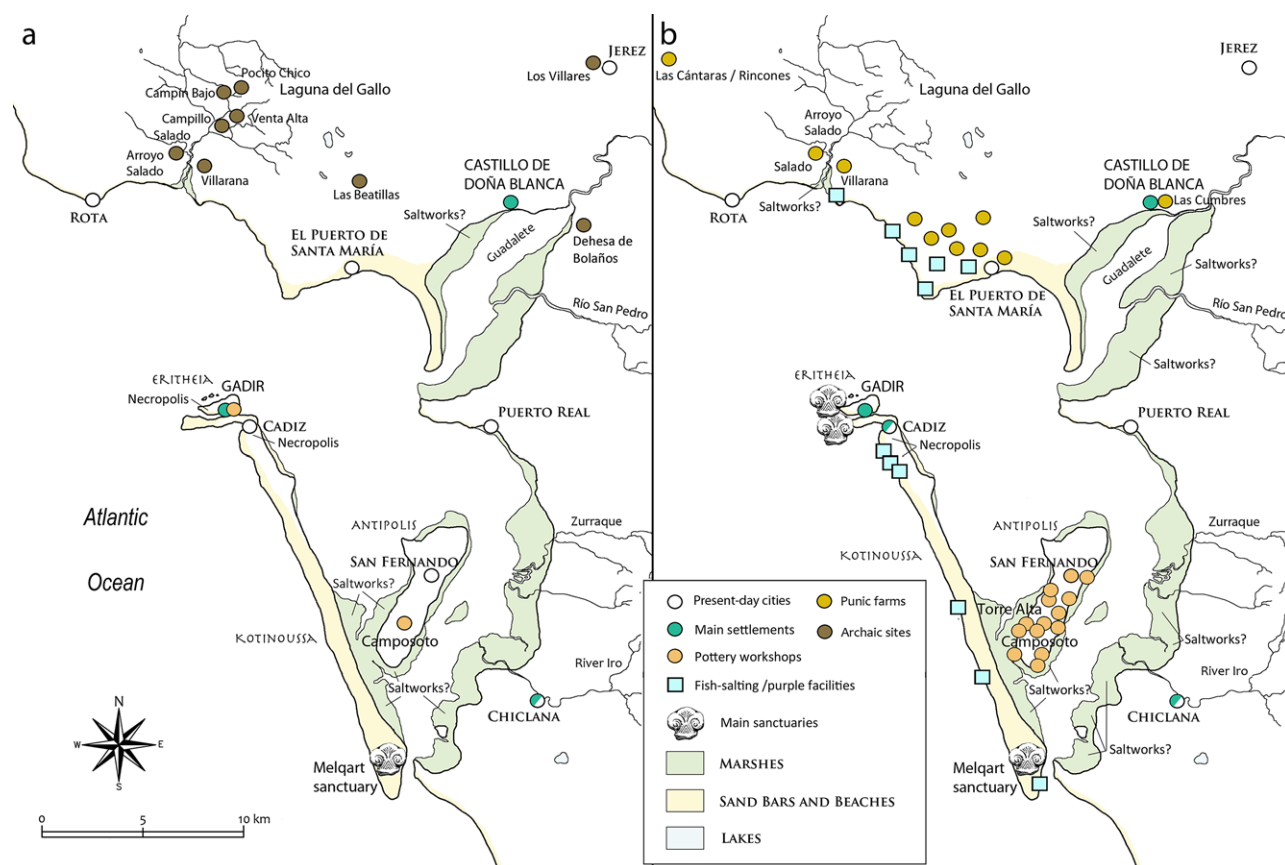


Figure 1. Synthesis of settlement patterns and geoarchaeological changes in the Bay of Cadiz during a) the Archaic period (8th–6th centuries BC); and b) the Punic period (early 5th to late 3rd centuries BC) (drawing: A. Sáez Romero).

must have been substantial, as the whole city was sea-oriented—even the sanctuaries—and commerce was its key activity throughout the 1st millennium BC. The town was annexed by Rome in the aftermath of the First Punic War (206 BC), and this marked the beginning of a period of renewed economic growth and increased exports to the Mediterranean markets.

The beach of La Caleta and the associated maritime environment are key to the analysis of the historical development of settlement on the island (Fig. 2). In recent decades, this coastal sector has been actively investigated by geoarchaeologists, and it also plays an essential role in the analysis of the maritime and religious activity on the island during both the Phoenician-Punic (Gadir) and the Roman periods (Gades). The area is located in the north-western sector of the islands. Some ancient sources refer to this group of islands as the archipelago of Gâdeira. The key feature of the area is a stretch of sea framed by the reefs of Santa Catalina-Punta del Nao (island of Erytheia) and San Sebastián (island of Kotinoussa). According to Strabo (3.5.3), the original Phoenician *oppidum* was built on the small northernmost island, and later sources suggest that a sacred area dedicated to Astarte/Venus (at the site of the Castle of Santa

Catalina) was also built there. In Kotinoussa, in the area known as ‘the Vendaval front’, which stretches as far as the Castle of San Sebastián, on the opposite shore of the channel Bahía-Caleta, a sacred area dedicated to Kronos or Baal Hammon (Maya *et al.*, 2014) was also built. This area would have been also characterized by constant sea traffic, the presence of anchorage areas and some port facilities such as berths or warehouses.

A recent quantitative and qualitative increase in information available for the Phoenician-Punic settlement and the palaeo-topography of this corner of the archipelago of Cadiz has inspired renewed debate and new hypotheses and interpretations (Fig. 3). The main goal of this article is to add new elements to this debate by discussing the results of the archaeological surveys carried out between 2008 and 2010. These surveys involved the application of updated techniques for scanning and interpreting the seabed, as well as the detailed and systematic recording of newly discovered Phoenician and Punic material (8th–3rd centuries BC). This evidence will be used to reconsider previous paradigms and to present alternative hypotheses about the role played by the area under study in antiquity. First, a brief review of previous research



Figure 2. *a)* Aerial view of Cadiz, which shows the location of La Caleta at low tide (Astillero and Garófano, 2003: 57, fig. 28); *b)* San Sebastián Castle and the southern part of La Caleta beach (photo provided by Isabel Dugo, IAPH); *c)* view of the central channel of La Caleta from the current sand bar of the beach (photo by A. Higuera-Milena); *d)* view of the rocky surface next to the Santa Catalina Castle, the northern side of La Caleta Channel, taken from the CAS building (photo by A. Higuera-Milena).

will be outlined, followed by an examination of the relationship between underwater remains and religious activity, the typology-chronology of the new material, the role of La Caleta as a harbour, the possible presence of shipwrecks, and, finally, proposals for future research.

## Previous research

Diving to recover archaeological material started early in this area. The first accounts of the discovery of inscribed stones and pottery near the modern fortifications date to the 17th century. Amphorae recovered throughout the 19th century were incorporated into the provincial archaeological museum in the 20th century (Romero de Torres, 1908–1909, published in 1934). Despite the strong currents and tides and low visibility on the seabed, with the beginning of modern diving La Caleta and the adjacent rocky seabed became key sites for underwater archaeology in the region, and the epicentre of underwater research on the Phoenician-Punic past of the bay. Unfortunately, the early decades of exploration of this land-sea environment were characterized by multiple ‘chance finds’ and the illegal and systematic plunder of large numbers of artefacts, especially pottery vessels. Some of these decontextualized pieces have ended up in the provincial museum, while the rest were

sold to private collectors, and are now lost for scientific purposes.

The earliest systematic research projects were initiated in the 1970s under the direction of Olga Vallespín, who explored several areas in 1973–1978 and 1983–1984 (Vallespín, 1985). In the early 1980s (1981–1983) projects directed by Juan Ramón Ramírez Delgado also involved surveys of the seabed to the north-west of Cadiz. These contributed interesting evidence on and new approaches to the palaeogeographical evolution of this area, as well as providing new information on its function as a harbour and also as sacred ground in antiquity (Ramírez and Mateos, 1985). These pioneering campaigns were followed by further systematic campaigns, for example those launched by the Museum of Cadiz (by R. Corzo, C. García Rivera and M. D. López de la Orden), while other seasons were frustrated by administrative problems (Ramírez and collaborators; O. Vallespín; Alonso, 1991). In any case, with the exception of a few actions that were part of a general, bay-wide, research project (Gallardo *et al.*, 1994, 1995), later works in the area were intermittent. These later works were coordinated by the Underwater Archaeology Centre (CAS), dependent on the regional government, and were focused on cataloguing and conservation (Alzaga *et al.*, 1999: 122–129; Alonso *et al.*, 1999: 130–137; Rodríguez



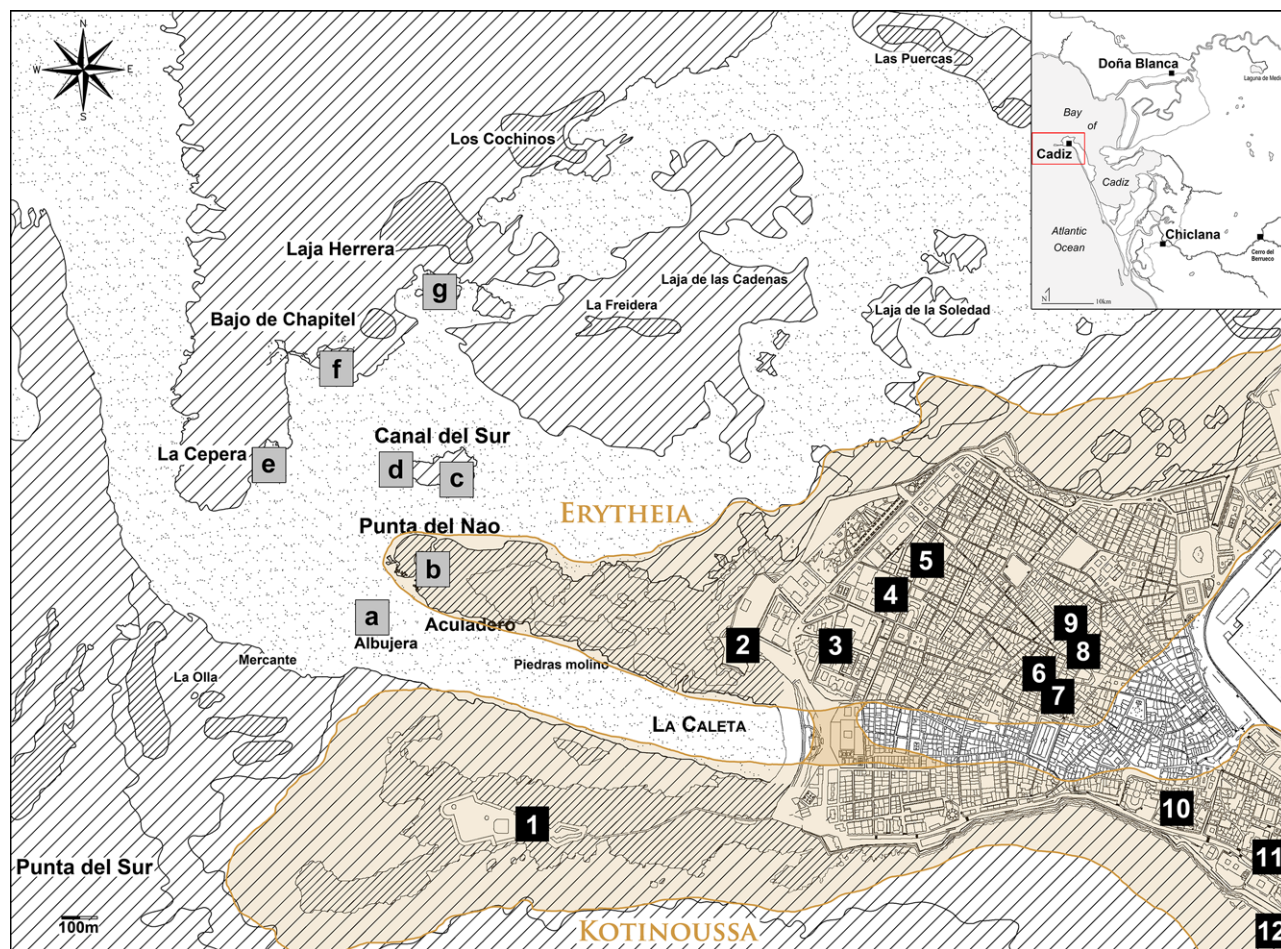


Figure 3. Plan of the northern area of Cadiz Island and its maritime extension, indicating (in brown) the shape of the Erytheia and Kotinoussa Islands in Phoenician and Punic times. Underwater sites: a) 'Juan Villa's shipwreck'; b) Punta del Nao; c) Canal del Sur 1; d) Canal del Sur 5; e) La Cepera; f) Bajo de Chapitel; and g) Laja Herrera. Phoenician and Punic sites on the main islands: 1) Castle of San Sebastián; 2) Castle of Santa Catalina; 3) Gregorio Marañón; 4) Hospital Real; 5) Calle Hércules; 6) Teatro Cómico; 7) Teatro Andalucía; 8) Cánovas del Castillo; 9) Calle Ancha; 10) Casa del Obispo; 11) Concepción Arenal esquina a Botica; and 12) Santa María del Mar beach (drawing by the authors).

and Martí, 2001; Martí and Rodríguez, 2003: 399–416; Martí, 2010).

Research carried out in the 1970s and 1980s resulted in the fossilization of the image of the channel as a harbour space linked to religious activities on the shore (Vallespín, 1985, 2000; Ramírez and Mateos, 1985). This was encouraged by the analysis of both chance finds and artefacts recovered over the course of the systematic campaigns, held in the provincial museum and private collections. These studies chiefly focused on the categorization of ceramic material that has traditionally been interpreted as votive (cult) items, such as incense burners and miniature amphoras (García y Bellido, 1971; Pérez Hormaeche, 1990, 1993; Muñoz, 1993), but some progress was also made in the analysis of transport amphoras (Alonso *et al.*, 1991).

Work carried out in the area over the past two decades has confirmed the abundance of Phoenician

and later material in the channel of La Caleta and other sectors to the north-west of Cadiz (Gallardo *et al.*, 1999: 21–23; Rodríguez and Martí, 2001). A survey undertaken in 2006 in Bajos de Chapitel provided additional information for the study of the Phoenician-Punic period, including different types of amphoras and several dipper juglets (Martí, 2010: 636–638, figs 3–4).

Between 2008 and 2010, renewed impetus for the scientific investigation of the area resulted in several surveys under the direction of the CAS (Martí, 2014; Higuera-Milena, forthcoming). Finally, a project promoted by the CAS, dependent on the Andalusian Institute of Historical Heritage (IAPH) and the University of Cadiz, entitled HAR2016-79387P 'El contexto arqueológico subacuático de La Caleta y su entorno (Cádiz): Puertos y pecios vertebradores de una ciudad y de un territorio' (2016–2018) is currently underway.



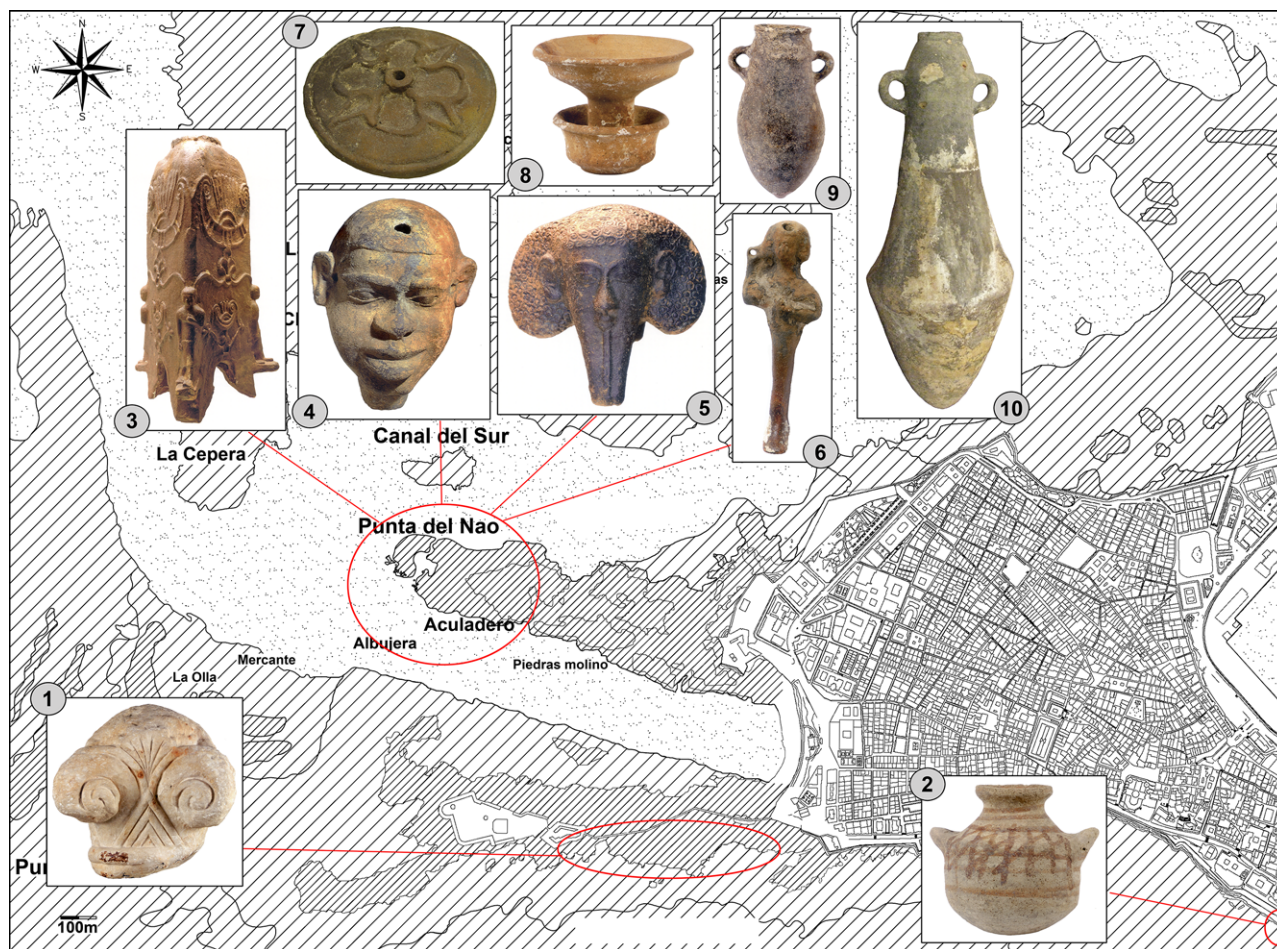


Figure 4. Plan of La Caleta showing the approximate location of the main types of finds discovered during the 20th century: 1) proto-aeolian capital; 2) 'Canaanite' *pyxis*; 3) *thymiaterion*; 4–6) terracotta objects; 7) pottery disc; 8) incense burner; 9) miniature amphoras; and 10) T-11210 amphora from 'Juan Villa's shipwreck' (images and drawing by the authors).

In conclusion, a reinvigorated scientific setting, and newly collected geoarchaeological evidence now make it possible to open innovative debates and to test old theories on the Phoenician-Punic settlement of the islands of Cadiz.

### Significant Phoenician and Punic finds

A very remarkable set of archaeological finds of Phoenician-Punic date has been collected from La Caleta and its immediate surroundings since the early 20th century. These artefacts have either been found by chance or as a result of scientific work, and are of diverse typologies, with very different interpretive implications (Fig. 4). In this regard, special mention must be made of the immediate environment of La Caleta and, especially, the Punta del Nao and the Aculadero, where a large number of ceramic items have been recorded and interpreted as religious offerings. The southern flank of the channel of La Caleta has been less prolific in purely quantitative terms, but the finds discovered in it include pieces of particular

interest, such as the 'Proto-Ionic' capital found near San Sebastián (Pemán, 1959: 58–70; Blanco Freijeiro, 1960: 151–159). This item, no parallel for which has been found to date in relation to Western Phoenician settlements, has been related to religious uses of uncertain date, perhaps as part of the architectural ornamentation of the *Kronion* mentioned by Strabo (Marín and Jiménez, 2011).

In addition to this piece, other important items have emphasized the use of this area and the island of Erytheia for religious purposes, from the Archaic Phoenician period onwards. The best known of these items is the so-called *thymiaterion* (Blanco, 1970). This item has been at the centre of multiple debates, and there are divergent interpretations as to its origin, function and chronology (Jiménez, 2007). As is often the case with objects illegally collected in La Caleta and sold to the museum in the 1960s and 1970s, the item is described in the museum catalogue (Card 8786, Museo Arqueológico Provincial of Cadiz, received on 28 March 1970) as a 'chance find' discovered near Punta

del Nao at a depth of 20–25m. The *thymiaterion* was the first of a series of emblematic pieces that flagged La Caleta as important for the study of maritime and religious activity in Phoenician Cadiz.

Other significant finds have occurred since, but none have been decisive in solving the unanswered historical questions on the religious and maritime function of the area, or in providing a more secure context for the numerous finds recorded by different means. In addition to the *thymiaterion*, we should mention the discovery of various singular terracotta objects such as Egyptian- and Nubian-style heads, statuettes representing suppliants or warriors, dog heads, female figures and two discs with schematic vegetal decoration. These artefacts have been connected to the operation of the sanctuary located in the western sector of Erytheia and also to the *Kronion* located in San Sebastián (Blanco, 1970; Corzo, 1983; Muñoz, 1993; Álvarez, 1992, 1997; Ramírez and Mateos, 1992, 1994; Belén, 2000; Ferrer Albelda, 2002; Jiménez, 2007; Frutos and Muñoz, 2008; Aubet, 2009; Gener *et al.*, 2014). Fortunately, some of them can be dated by moulds found in kiln sites in the southern part of Cadiz Island, in present-day San Fernando, that suggest that the Nubian-style head and some of the figurines were produced during the 5th century BC (Ramon *et al.*, 2007).

One of the most characteristic and common items are the miniature amphoras, which are generally interpreted as dating to the Classical period. A huge number of these were raised as chance finds both before and after scientific exploration in the area commenced—and therefore, without recorded archaeological contexts. Their presence throughout the whole area of La Caleta has been attributed to a gradual deposition pattern between the 5th and 3rd centuries BC. They have been interpreted as offerings presented in order to propitiate a good voyage; probably tossed straight into the sea as part of a ritual that also involved the deposition of offerings in the sanctuaries located around La Caleta (García y Bellido, 1971; Corzo, 1983; López and García, 1985; Alonso *et al.*, 1991; Muñoz, 1993; Vallespín, 2000). Other authors, however, have proposed that they would have been part of the cargo of ritual ships wrecked in the area (Ramírez and Mateos, 1985).

Other common ceramics that would have been used as offerings are incense burners (Pérez Hormaeche, 1990; Muñoz, 1993) and small dipper juglets (Pérez Hormaeche, 1993; Muñoz, 1993), but it is worth noting that both types can be found in the grave goods of local tombs of the Archaic period (Sáez and Belizón, 2014).

Also abundant are transport amphoras of Phoenician and Punic date. These have been attested at different points of this coastal sector, but have received less attention than the items classified as offerings; as a result, the typological and especially the published contextual information is very insufficient. Finds dated to the Archaic period are (to date) few, but some of

the surveys carried out in the early 1980s did lead to the discovery of several T-10121 vessels (Alonso *et al.*, 1991). The presence of T-11210, T-12111, T-8211 and T-9111 amphoras, alongside other Iberian, Turdetanian, Greek or Carthaginian types is better documented, and may reflect an increase in commercial traffic and religious or funerary activities between the 5th and 2nd centuries BC (Alonso *et al.*, 1991; Muñoz, 1993).

In relation to this important collection of archaeological items, it is important to highlight the almost total absence of shipwreck remains of pre-Roman date in the area. This stands in contrast to the abundance of Punic items found in secondary contexts. There are vague and, up to now, unconfirmed references to a possible 4th- or 5th-century BC shipwreck near La Albuja, located at the entrance of the channel, referred to as ‘Juan Villa’s Punic Shipwreck’, in honour of its discoverer. Local divers are well aware of this sector and refer to it as ‘La Escombrera’ or ‘the pottery dump’. It seems that the area is covered in Punic amphoras (T-11213 or T-12110) that appear to be in a good state of preservation (Figs 4 and 5).

## Results of the 2008–2010 seasons

The material presented here was found in the context of the project ‘Experimental implementation of geophysical techniques for the identification, investigation and distribution of archaeological evidence in the area of La Caleta (Cadiz)’, (Punctual Archaeological Activity, Ref. IDPH. 05/PU/CA/08, authorized on 12 May 2008 and finished on 31 July 2010). The project was promoted by the CAS-IAPH within the framework of a wider project: ‘Underwater Archaeology Map of Andalusia’, and was directed by one of the authors, A. Higuera-Milena Castellano. The centre’s staff carried out all the fieldwork and later study of the material with the support of a few external collaborators.

The project’s main targets were to carry out geophysical survey in order to increase our knowledge of the geomorphology of the seabed of La Caleta, and to try to contextualize the available evidence on maritime traffic from antiquity until more recent periods. The area included in the project is within an archaeologically protected area known as the ‘Subaquatic area of the Bay of Cadiz’. This area is divided into six archaeological sectors (AS): El Aculadero, Punta del Nao, Piedras de Molino, Bajo de Chapitel, Cepo de Plomo and Punta del Sur. These sectors host Phoenician-Punic, Roman, Medieval and Modern sites, and a wide variety of finds. Previous publications have provided a partial overview of the project’s methodology and outcome (Higuera-Milena and Sáez, 2014; Higuera-Milena, forthcoming), and a basic picture of geophysical results, the characteristics of the sites recorded, and the historical-archaeological



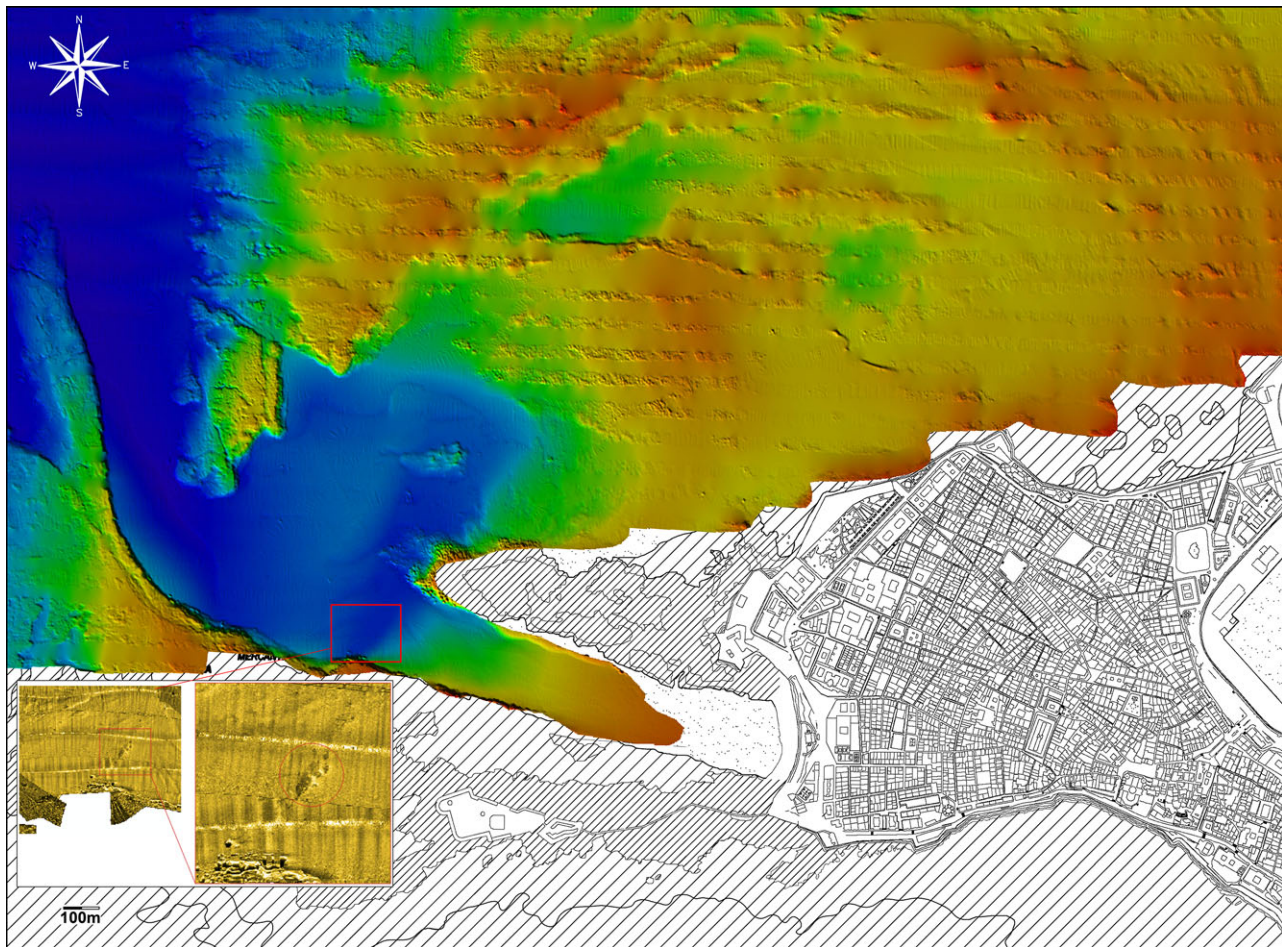


Figure 5. Results of the bathymetric research conducted in 2008–2010 north and west of La Caleta. Inset: detail of the possible location and remains of the ‘Juan Villa’s shipwreck’ (after Higuera-Milena and Sáez, 2014: 997, fig. 4).

implications resulting from the analysis of the materials associated with each AS.

Other publications resulting from the project deal with the Phoenician (Sáez and Higuera-Milena, 2016a), Punic (Sáez and Higuera-Milena, 2016b) and Roman-Republican (Higuera-Milena and Sáez, forthcoming) periods, as well as the Imperial Roman amphoras of the Eastern Mediterranean provenance (González *et al.*, 2016). Another presents a collection of amphoras that includes material found in La Caleta, dated to between the Punic and the Imperial Roman periods, currently deposited in the Municipal Historical Museum of San Fernando (Sáez *et al.*, 2016). Other publications that deal with significant finds and donations are also in preparation (for example incense burners, Sáez and Higuera-Milena, 2016c).

### Geophysical survey and fieldwork

The project has analysed the results of applying different geophysical techniques in an area where there are very different depths and types of seabed (sands,

gravel, silt and rock), as well as types of archaeological finds (ceramic, metal and stone objects). Geophysical techniques (sidescan sonar, marine magnetometer, multibeam echosounder, and seismic profiler) were used in combination with visual survey. The information collected is rich and wide-ranging, and relates to sites dating to all periods, from antiquity to modern times.

Divers also explored the anomalies detected during the geophysical survey, and investigated in more detail those areas for which the geophysical results were unclear owing to the characteristics of the seabed or adverse weather conditions (Fig. 6). The visual survey followed different formats: for example linear survey, concentric circles, and transects. This took place between 2008 and 2010, especially from May to September, when sea conditions are at their most favourable. The assistance of the CAS of Andalusia was crucial during this stage.

During this fieldwork, the importance of focusing specifically on certain areas was noted, and archaeological test trenches were undertaken in the areas of La Cepera, Punta del Nao and two in

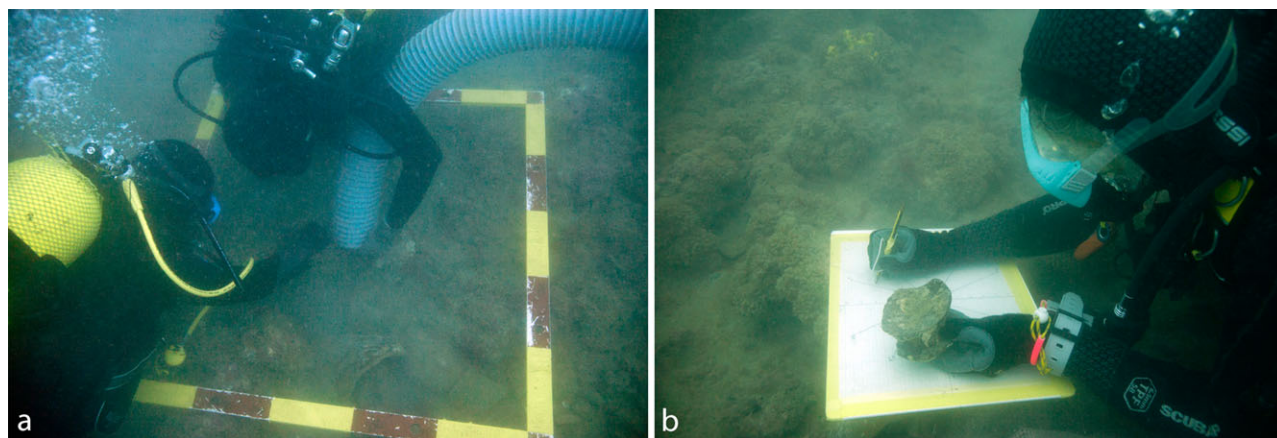


Figure 6. a) Excavation of a 1 × 1m area; and b) drawing the distribution of finds (photos by A. Higuera-Milena).

the Canal del Sur sector. The main purpose of these test pits was to define the limits of some significant groups of material and also to establish more precisely the chronological and typological characterization of the sites, and to propose the most adequate protection measures. Excavation squares (1 × 1m) were georeferenced by GPS from the ship or by triangulation with set benchmarks. Excavation either followed stratigraphic criteria or was guided by spits, depending on visibility and seabed mobility conditions, with stratigraphic criteria followed whenever possible. The soil was extracted by means of a dredge and, once sieved in search of archaeological remains, reused to backfill the excavation trench.

Despite the promising prospect presented by the concentrations of material, it was impossible *a priori* to be sure whether the finds were *in situ*, either shipwreck remains or an area of intentional deposit, or the result of postdepositional processes, such as currents. Excavation did not produce any evidence for ancient shipwrecks; nor did it clarify the nature of these concentrations of material, which were sometimes composed of items from very different periods and represented a wide typological range. Other materials here from Laja Herrera and Bajo de Chapitel were found during the survey, and they do not appear to be related to one another or indeed to other finds.

## Sites and finds

The quantity and typological variety of the Phoenician material found in 2008–2010 was very uneven across the five main operation areas (see below). This cannot be attributed only to the ‘natural’ distribution of items caused by positional and postdepositional processes, but also to the greater incidence of looting in the interior channel of La Caleta and the nearby Punta del Nao. In any case, the sample is quantitatively small, but it is still significant in terms of chronology and typology, as it complements previous evidence

provided by chance finds, underwater interventions or archaeological excavation at the shore (Fig. 3).

### Canal del Sur

Several anomalies detected by the sidescan sonar prompted a visual survey, which resulted in the identification of a broad scatter of Punic and Roman-Imperial ceramic items. Several areas were isolated in this sector in the period 2008–2010. The northern sector (Canal del Sur 1) provided abundant amphora sherds, especially of Punic date, as well as double candleholders (saucers), miniature amphoras and common and burnished wares dating to a number of different periods.

The earliest periods in Canal del Sur 1 yielded some ceramic material other than amphoras, which is of interest when assessing the Phoenician presence (Fig. 7): specifically, we should note a *pithos* dated to the 7th or early 6th century BC. More recent remains of amphoras include several fragments of locally produced T-11213 in varying states of preservation (CSUR/CA09/04); this type has been dated throughout the 5th century BC. A fragment partially featuring the rim, wall and handle of a locally made amphora that appears to be inspired by the profile of the T-1323 type, from Ibiza, can be dated to the late 5th century, but it is impossible to ascertain whether it was contemporaneous with the T-11213 type. Similarly, this location also yielded non-amphora ceramic remains dated to the early Punic period, for instance two large vases that are reminiscent of Archaic *pithoi* (Camposoto types XIa2-3 or XIb3-4; Ramon *et al.*, 2007: 64–95).

Other amphora remains found in Canal del Sur 1 can be dated to the late Punic and the early Roman-Republican periods. Especially of note is a set of wide T-8211 containers, which can be dated to the late 4th and early 3rd centuries BC (CSUR/CA10/85). A few examples of this same type are narrower and have smaller handles, perhaps denoting an even later chronology, from the late 3rd or, more likely, early 2nd century BC. One specimen of the T-12111/2 type, made



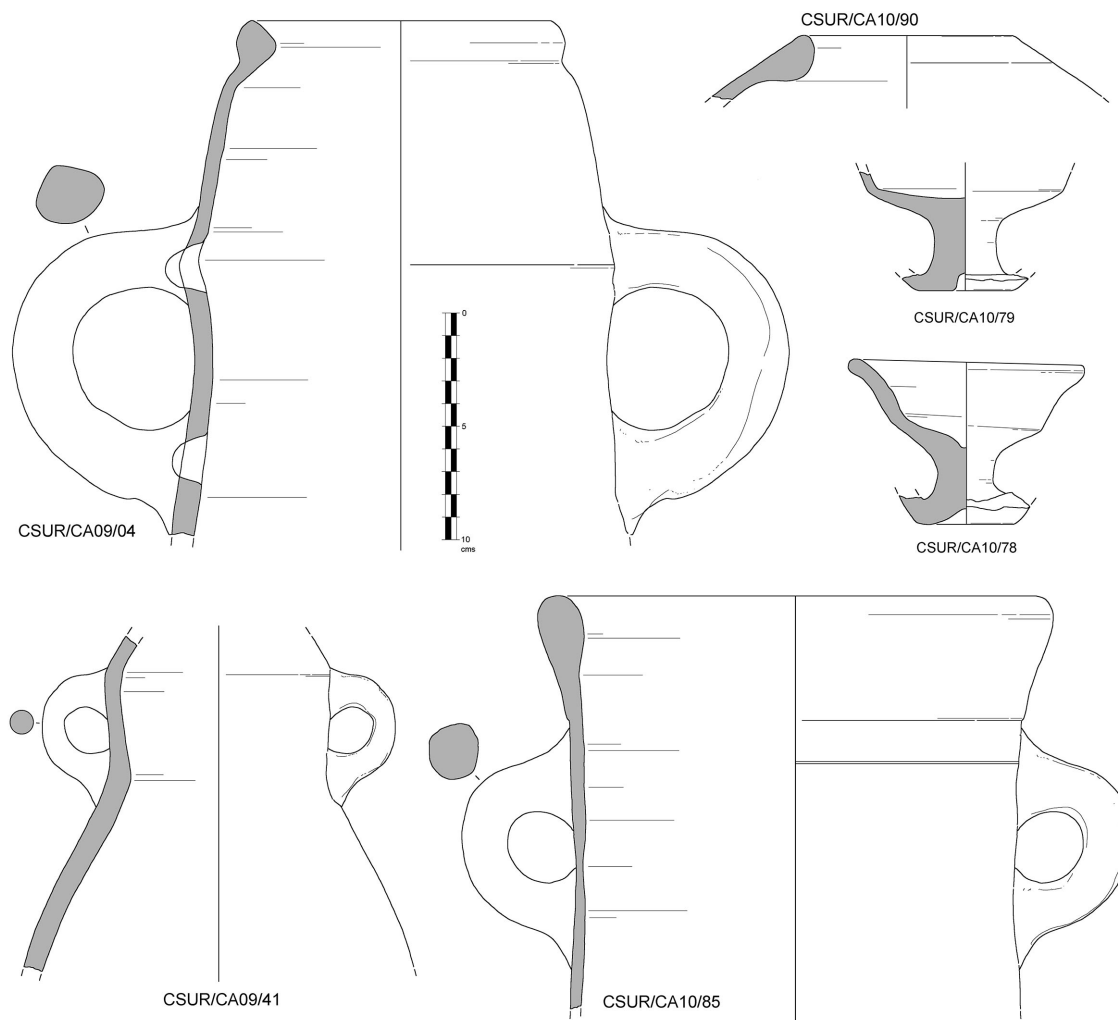


Figure 7. Pottery from Canal del Sur 1: T-11213 (CSUR/CA09/04); Turdetanian Pellicer D amphora (CSUR/CA10/90); incense-burners (CSUR/CA10/78 and 79); miniature amphora (CSUR/CA09/41); T-8211 (CSUR/CA10/85) (drawings by the authors).

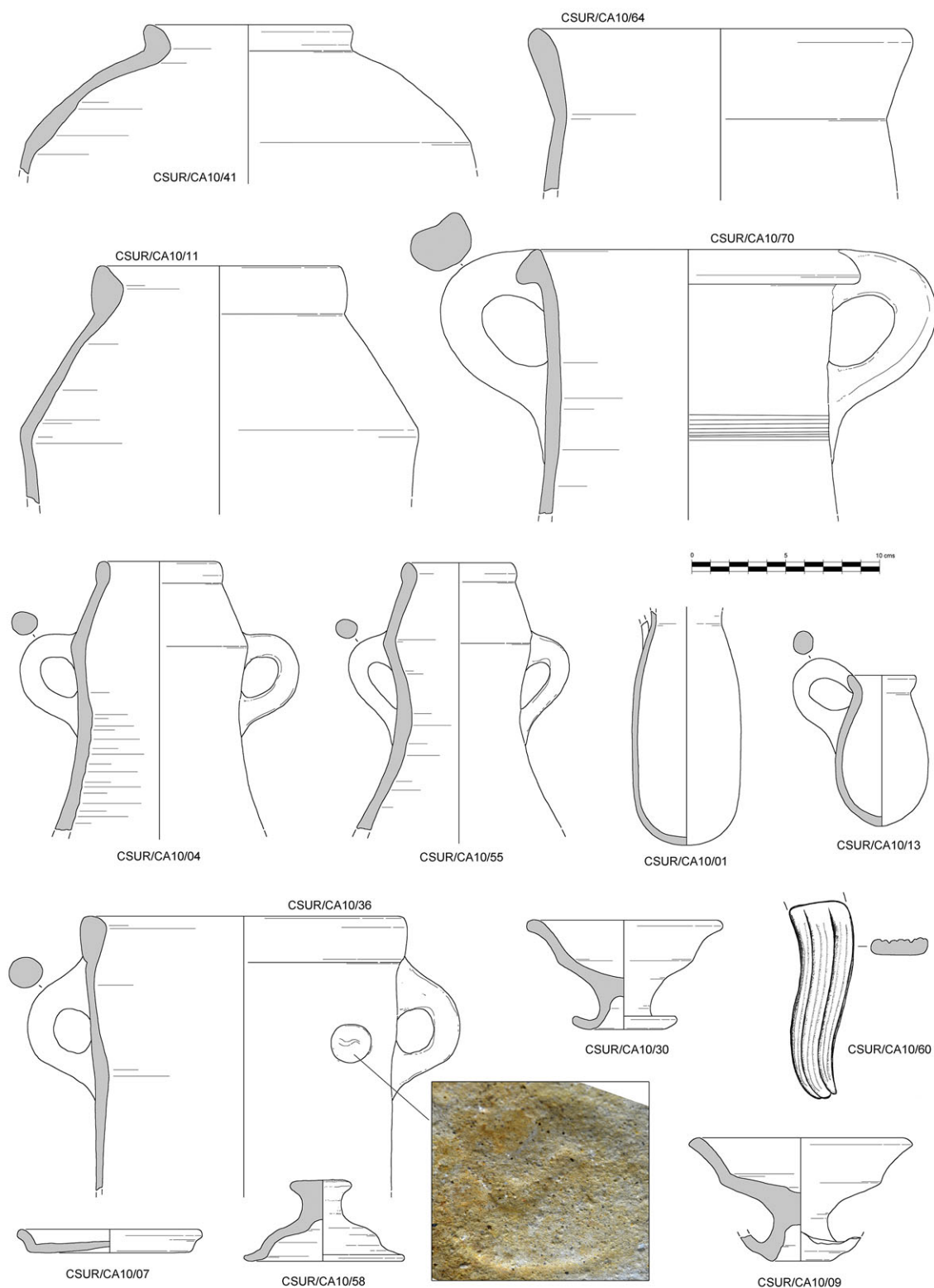
from local clays, an imported T-12111 and a fragment of a Turdetanian Pellicer D type also belong to this late Punic chronology (CSUR/CA10/90).

Finally, three double-saucer incense burners (CSUR/CA10/78-79) and two lids, all locally made, found in this area can also be dated to the late Punic period. These objects are generally ascribed a religious purpose. Concerning the locally made miniature amphoras inspired by the SG-11/12 types (CSUR/CA09/41), recent research has suggested a use related to the transport of luxury foodstuffs, and has proposed a wide chronological range between the 5th and 3rd centuries BC, on the basis of stratigraphic evidence from coastal settlements (Niveau, 1999; Gutiérrez, 2000; Sáez Romero, 2008).

To the east of Canal del Sur 1 a cluster of material was identified (Canal del Sur 5), with an approximate radius of 10m. The material was much more abundant, and there was a clear predominance of material dating

to the early Punic period and to the transitional period between the Punic and the Roman-Republican phase (Fig. 8). Some Archaic material was also identified, for instance a specimen of T-10121 amphora (CSUR/CA10/41), dated to the 7th or the early 6th century BC. The type has already been attested in La Caleta, both in Punta del Nao (Alonso *et al.*, 1991: 602, fig. 1, I.1) and Chapitel (Martí, 2010), as well as at land sites on the islands of Cadiz and the continental coast (Ruiz and Pérez, 1995; Torres *et al.*, 2014).

Two small imported dipper juglets probably contained perfumes or other liquids, and can also be dated to the Archaic period (CSUR/CA10/01 and 13). One of them could be of Eastern production. The presence of these items has been a constant in La Caleta from the earliest stages of research, and a large number of examples have been recorded to date, especially in the areas of Punta del Nao (Pérez Hormaeche, 1993; Muñoz, 1993) and Chapitel (Martí,



*Figure 8.* Finds located in Canal del Sur 5 site: Phoenician T-10121 amphora (CSUR/CA10/41), T-8211 (CSUR/CA10/64); T-11213 (CSUR/CA10/11); plain ware (CSUR/CA/70); miniature amphoras (CSUR/CA10/04 and 55); dipper juglets (CSUR/CA10/01 and 13); T-9111 with dolphin stamp (CSUR/CA10/36); lids (CSUR/CA10/07 and 58); incense burners (CSUR/CA10/30 and 09); terracotta object (curly hair?) (CSUR/CA10/60) (drawings and photograph by the authors).



2010: fig. 4); they have a wide chronological range dating from the Archaic period to the 5th century BC.

A significant proportion of the amphora fragments recorded have been dated to the late 5th century BC, plausibly pointing towards the presence of a shipwreck in the area or an increase in maritime traffic during this period. The most significant specimen is one T-11213 type made with local clays (CSUR/CA10/11), several bottom parts of the T-11214/5 type or an early form of the T-12111 type, characterized by the external moulding typical of the transitional period between the 5th and 4th centuries BC, and an imported T-11216 type. The local amphoras found in this sector also include an imitation of the Ibiza-made T-1323 type, dating to the late 5th century BC.

A heterogeneous set of common- and cooking-wares may also be dated to this period, although the lack of precise archaeological context precludes any certainty in this regard. This set includes a two-handled vase similar to those found in Canal del Sur 1 and a large *pithos*-like container. The cooking-wares include seven mid sized globular pots with pseudo-rounded and folded lips; except for one specimen, which is similar to the DIVa1-2 type of Camposoto, without any incision between the body and the rim (CSUR/CA10/70).

Slightly later material includes local amphoras dated to the mid or late 4th century BC, specifically the top quarter of a T-12111 type and the rim of a broad-mouthed T-8211 (CSUR/CA10/64). The survey also identified a large group of T-9111 amphoras, a type dated to the late 3rd and 2nd centuries BC (CSUR/CA10/36) (Higueras-Milena and Sáez, forthcoming). Finally, the chronology of a group of small items can only be restricted to sometime in the Archaic or the Punic period. This group includes seven double-saucer incense burners (CSUR/CA10/09 and 30), six lids (CSUR/CA10/07 and 58) and a simple plate-lid (*piatto a 'bugia'*), as well as two miniature amphoras (CSUR/CA10/04 and 55). The fragment of a possible terracotta statue was found alongside these items, which were likely to have had a ceremonial function; the terracotta appears to represent a flat hair curl, likely detached from the main body of a sculpture by the action of the marine erosion (CSUR/CA10/60).

Overall, the finds recorded in Canal del Sur provide an interesting diachronic perspective on the use of this area. There is a modest quantity of Archaic material (one *pithos*, one T-10121 amphora and several dippers), which supports the theory that this sector to the north-east of La Caleta was frequented by Phoenician vessels at least from the 7th century BC onwards. Amphora sherds and small ceramic items (incense burners, miniature amphoras, lids, etc.) dating to the period between the late 6th and the early 2nd century are much more abundant, which probably indicates an intensification of maritime traffic connected to the urban and economic development of Punic Gadir. The test excavations carried out to date, however, have not clarified whether these finds are a result of shipwrecks,

accidental depositions, deliberate ceremonial offerings, or coastal erosion.

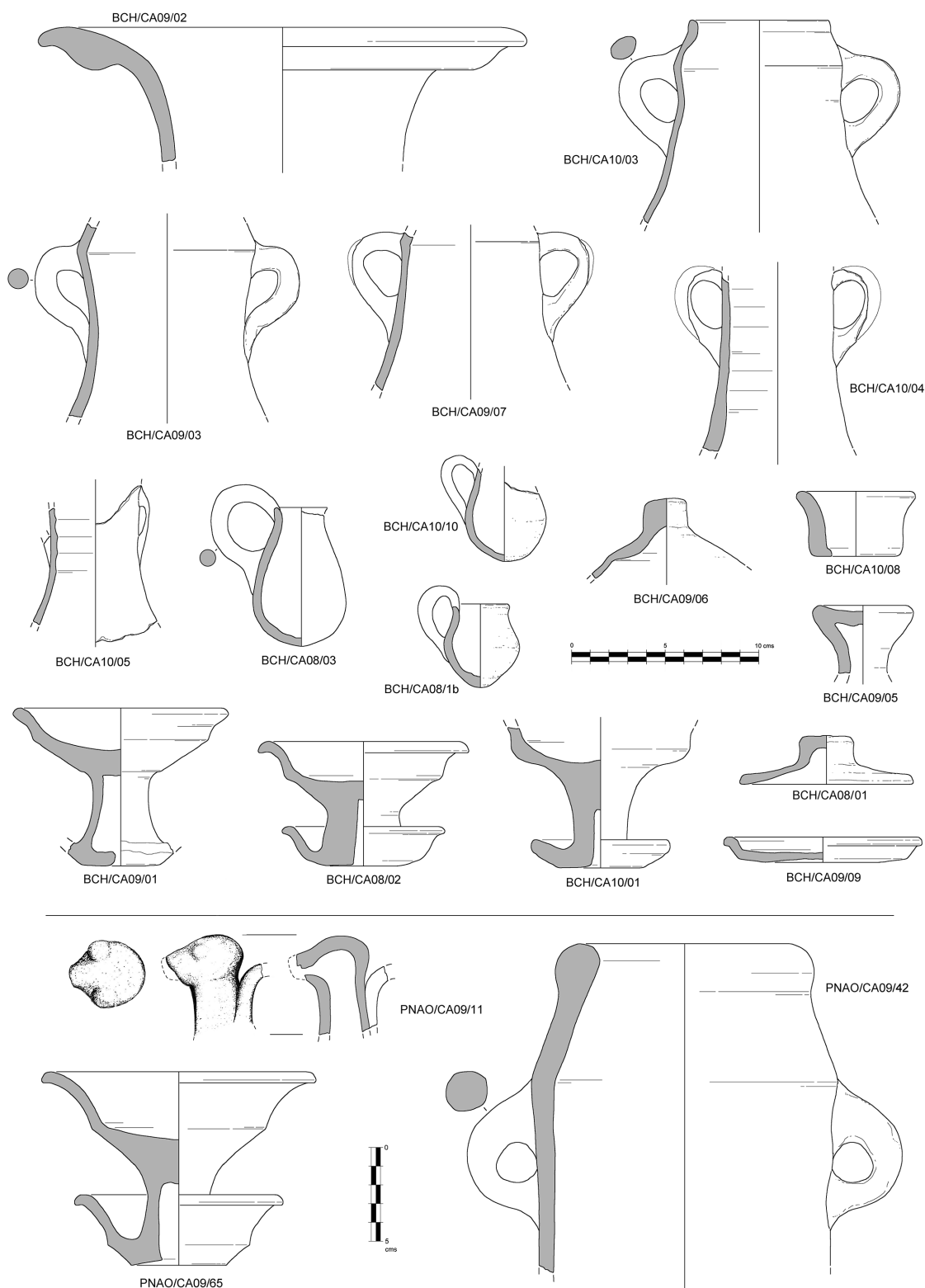
### *Bajo de Chapitel*

The material recovered in the area of Chapitel was very scarce, and has provided little evidence of commercial traffic and the use of amphoras thereof. In contrast with previous research campaigns, which recorded Archaic T-10121 amphoras, incense burners, dippers and Punic and late Punic amphoras of different typologies (Martí, 2010), on this occasion most of the items identified belonged to typologies of the small vessels commonly used in cult contexts.

The Archaic material includes a set of five small dipper juglets (Fig. 9). Some of these have a stylized profile, similar to a Greek *olpe*, whereas the rest are shallower and more reminiscent of a *kyathos*. Also a portion of an 'oil bottle' of possible Oriental origin was found, which is too fragmented for a precise typological classification. In any case, on the basis of the latest characterizations of the type, it must be dated before the late 6th century (Orsingher, 2010: 5557, tav. II). The material dating to the Punic period (5th-3rd century BC) includes a group of five miniature amphoras (BCH/CA09/03 and 07; BCH/CA10/03-05), and also three local double-saucer incense burners which present different formal attributes (BCH/CA08/02; CA09/01 and CA10/01), several lids of different sizes (BCH/CA08/01 and CA09/05-06) and a small plate similar to the one found in Canal del Sur 5 (BCH/CA09/09). It is likely that the burners, the lids and the plate were used together. Only an amphora rim, a T-7421 from Tunisia (BCH/CA09/02), can be included among the pre-Roman finds, with a date range that spans the late 3rd century to the first half or first two-thirds of the 2nd century BC (Ramon, 1995: 209–210).

### *Punta del Nao*

This area of La Caleta was singularly affected by looting in the mid 20th century, but this is also the area on which most scholarly attention has been focused in the past decades. This high level of attention is due to the relevance of previous isolated finds, the area's possible relationship with a sanctuary to Astarte/Marine Venus, and its connection, through the rocky fringing reef of Santa Catalina, with the Phoenician site on Erytheia Island. This and other important sectors, for example El Aculadero (Vallespín, 1977, 1985), in the interior of the harbour channel of La Caleta, were the find spots of emblematic pieces such as the prism-shaped terracotta that has been interpreted as a plinth (Blanco, 1970), the Egyptian- and Nubian-style heads (Ramírez and Mateos, 1992, 1994) and a remarkable number of double-saucer incense burners (Pérez Hormaeche, 1990), dipper juglets (Pérez Hormaeche, 1993) and transport amphoras (Alonso *et al.*, 1991).



**Figure 9.** Material found at Bajo de Chapitel (BCH) (top): Carthaginian amphora T-7421 (BCH/CA09/02); miniature amphoras (BCH/CA10/03, 04 and 05, CA09/03 and 07); dipper juglets (BCH/CA08/03 and 1b, CA10/10); lids/stoppers (BCH/CA09/05 and 06, CA08/01, CA10/08); incense burners (BCH/CA09/01, CA08/02, CA10/01); plate (BCH/CA09/09). Punta del Nao (PNAO) (below): *askos* representing a pigeon (PNAO/CA09/11); imported T-12111 amphora (PNAO/CA09/42); incense burner (PNAO/CA09/65) (drawings by the authors).



The area of Punta del Nao, which is directly adjacent to the rocky promontory of Santa Catalina, illustrates particularly well the need to design projects that, while examining previous evidence in detail, undertake new research initiatives from an interdisciplinary perspective. This is the only way to advance the interpretation of the material record of La Caleta, which to date has been devoid of any stratigraphic context. Considering this persistent lack of information, the authors are carrying out a systematic study of the entire archive of finds from La Caleta stored at the Museum of Cadiz, and both archaeometric and typological analysis will play a very significant role in the current project. The examination or re-examination of amphoras, terracotta items and small ceramic objects will lead to studies of provenance through fabric analysis, typology, stamps, contents and coatings, and other aspects that have barely been touched on by previous research.

The Punic material (5th–3rd century) recovered in 2008–2010 was scarce and disperse, and no significant concentrations or underlying structures could be identified (Fig. 9). The most abundant ceramic remains were, of course, transport amphoras, but most of the items date to the Roman-Republican period. The oldest specimen seems to be a local T-11213 amphora, dated to the mid 5th century. A well-preserved local double-saucer incense burner (PNAO/CA09/65) can also be dated to the late Archaic period. Other amphoras seem to belong to much later periods, such as three imported late T-12111 amphoras (PNAO/CA09/42), which certify the arrival of commodities from elsewhere in the Strait of Gibraltar coastal area in the 3rd–2nd centuries BC. A fragment of a bird-shaped *askos* (PNAO/CA09/11), a common type in funerary contexts in Cadiz in the 2nd and early 1st centuries BC (Muñoz, 1992; also in local kiln sites, see Sáez, 2006: 1975–1979) should also be dated to this transitional period. This last item suggests sea erosion of ancient burial grounds or pits filled with offerings located in the area of Santa Catalina.

### *La Cepera*

The oldest material in La Cepera is unique in the underwater archaeology of the Bay of Cadiz, as it represents the first solid evidence for the systematic use of the harbour during the Archaic period (Fig. 10). The presence of a minimum of ten T-10121 amphora specimens (CEPE/CA09/53, 55 and 103), *pithoi* (CEPE/CA09/127 and 184) and perhaps also several pots from La Cepera suggest an increase in maritime traffic, and the use of the zone of La Caleta between the mid 7th century BC and the end of the Archaic period. This phase corresponds to periods II and III of the stratigraphy of the Teatro Cómico sequence (Torres *et al.*, 2014: 63–79).

The evidence suggests that this natural channel was used as a harbour, and that it was connected with the Phoenician habitation sites in Casa del Obispo,

Calle Ancha, Cánovas, Teatro Andalucía and Teatro Cómico (Botto, 2014; Niveau, 2015). Based on the evidence collected in 2008–2010, it is not possible to determine if the materials have been deposited as a result of regularly occurring activities or isolated events, such as a shipwreck—possibilities that should not be disregarded—instead, the evidence points to progressive accumulation caused by the use of the area as a mooring place.

It is likely that this was a period of consolidation and expansion for the colony, a period for the development of ever-wider networks in the south-west of the Iberian Peninsula and on the Atlantic coast (as suggested by Botto, 2014). In any case, it is significant that recent excavations in the Castle of San Sebastián, where the structural remains have been associated with the *Kronion* mentioned in written sources, have indicated that the occupation of the southern sector of La Caleta took place in the 7th century (Maya *et al.*, 2014: 177). Although our evidence still lacks detail, it seems likely that the Archaic material found on the seabed could have been connected with the creation of sacred places in the area of La Caleta.

As was the case for Canal del Sur, much of the material can be dated to between the mid 5th and early 4th centuries BC, but some evidence suggests that this area was used as a harbour for much longer, until late antiquity. Concerning the Punic phase, the project recovered several specimens of the local T-11213 type, dating to the 5th century BC. A series of rims that have a more developed appearance could be evidence of the presence of T-11214/5 amphoras, dating to the late 5th century BC, as well as the imported T-11216 type, manufactured elsewhere in the region of the Strait. Similarly, several specimens of the local version of the T-1323 type, as well as a very early version of the T-8211 type, are also attested (CEPE/CA09/31); *grosso modo*, these shapes can be dated to the turn of the 4th century BC. It is likely that the late Archaic assemblage also includes a cylindrical jar similar to other examples present in Canal del Sur and the XIa2-3 types from Camposoto (Ramon *et al.*, 2007: 91). The record also incorporates several cooking-wares, including a number of coarse globular pots with folded rims, which could also be dated to the early Punic period.

The use of the area of La Cepera in the 4th and 3rd centuries BC has been confirmed by the discovery of developed T-8211 (CEPE/CA09/35), T-9111 (CEPE/CA09/100) and T-12111/2 (CEPE/CA09/61) local amphoras. The record also includes three local miniature T-11/T12 amphoras (CEPE/CA09/158), several jars, broad mouths and ovoid shapes (similar to the GDR-8.1.1 type), and several globular pots with a developed Hellenistic profile.

The new evidence suggests that renewed attention should be paid to La Cepera in future campaigns. The large volume of Phoenician, Punic and Roman-Republican material calls for a systematic intervention

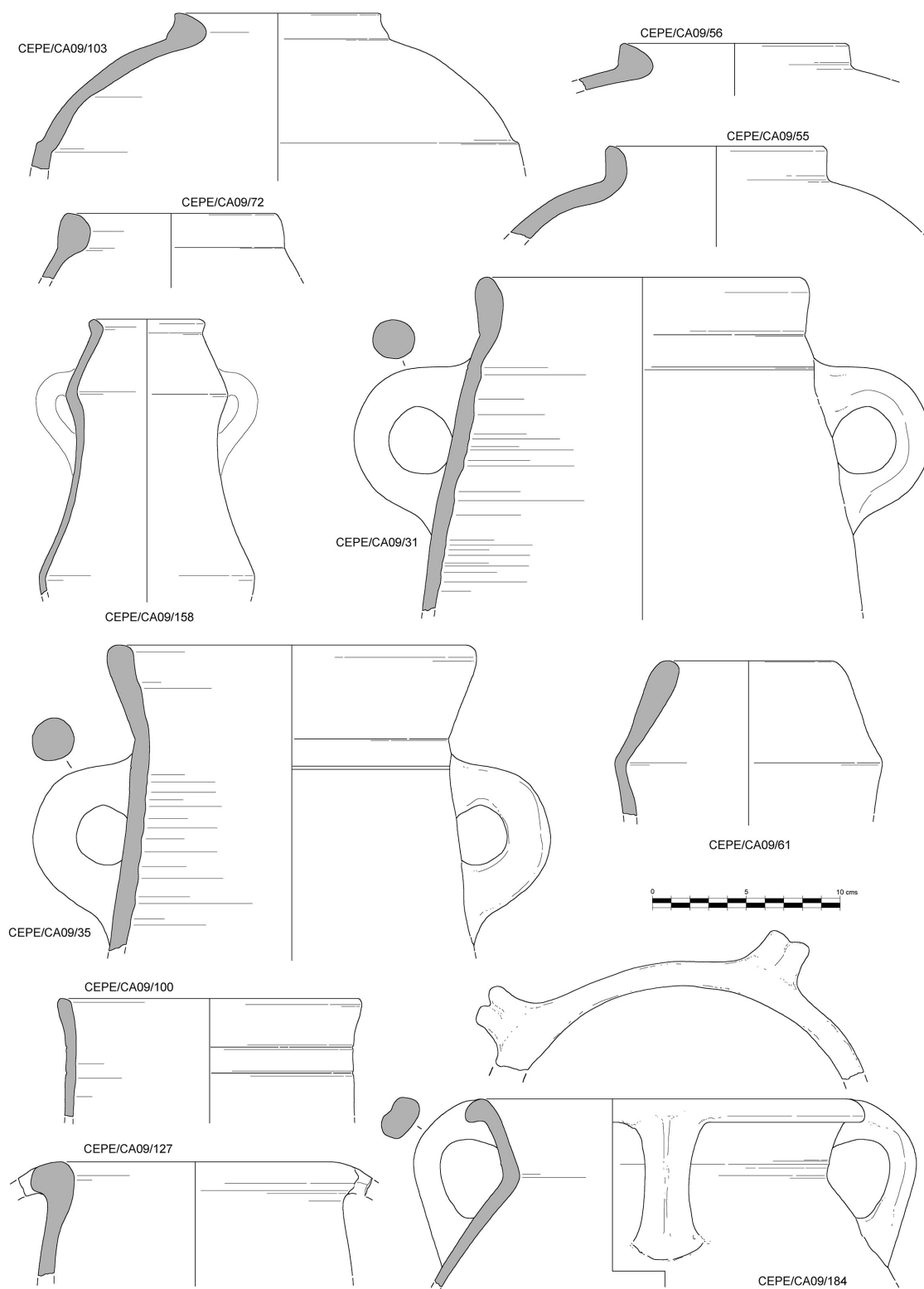


Figure 10. Pottery finds collected at La Cepera: Phoenician amphoras T-10121 (CEPE/CA09/55, 56 and 103), local and imported Punic amphoras T-8211 (CEPE/CA09/31 and 35), T-11210 (CEPE/CA09/72), T-12111 (CEPE/CA09/61), T-9111 (CEPE/CA09/100), miniature amphora (CEPE/CA09/158) and *pithoi* (CEPE/CA09/127 and 184) (drawings by the authors).



similar to that undertaken in Canal del Sur. The sea dynamics of this area—currents, storms, tsunamis, etc.—should also be studied in order to better understand the presence of archaeological remains beneath large rocks. The large concentration of Archaic Phoenician remains found in this area, which is the most solid evidence for the intensity of sea traffic in the bay during the 7th and 6th centuries BC, should also be paid special consideration.

### *Laja Herrera*

The remains dated to the Archaic period found in this area are very scarce (Fig. 11). However, a possible T-10121 (HERRE/CA09/03) amphora similar to those attested in La Cepera and Canal del Sur 5 should be noted. In the absence of other associated material, it is possible to date this amphora to sometime in the late 7th or the first third of the 6th century BC, when the settlements in the Bay of Cadiz were already producing their own containers (Ramon, 2010). The late Archaic repertoire also includes fragments of coarse wares, for example a large Camposoto CVa1 type *pithos* of the mid 5th century BC (Ramon *et al.*, 2007).

Along with these Archaic remains, other later transport amphoras were also found in Laja Herrera, mostly locally produced. The rim of a T-11213 amphora (HERRE/CA09/07), a two-handled jar of Camposoto XIa2 type (HERRE/CA09/16), and perhaps also a large *pithos* that is very similar to the CVa1 type, can also be dated to the mid 5th century (Ramon *et al.*, 2007). Finally, three double-saucer incense burners found in different states of preservation may also be included in the group of material of this period. A significant and heterogeneous group of remains can be dated slightly later. This assemblage includes a local T-8211 amphora (HERRE/CA09/12), that may be associated with an earlier T-11213 type. A much-developed example of the T-8211 type suggests that the shape was still in circulation during the 3rd century BC.

In addition to these transport vessels, the survey in Laja Herrera also yielded small local items that have traditionally been associated with cult activities that took place in the waters of La Caleta. This material set includes two miniature amphoras (HERRE/CA09/02 and 03), two double-saucer incense burners (HERRE/CA09/01 and CA10/01), and four small lids (HERRE/CA10/02 and 06). As previously noted, these types of items are common in La Caleta and its immediate environment, especially in La Cepera and Canal del Sur, although the isolated nature of the finds does not allow for further precision concerning chronology, function and depositional process.

## Discussion

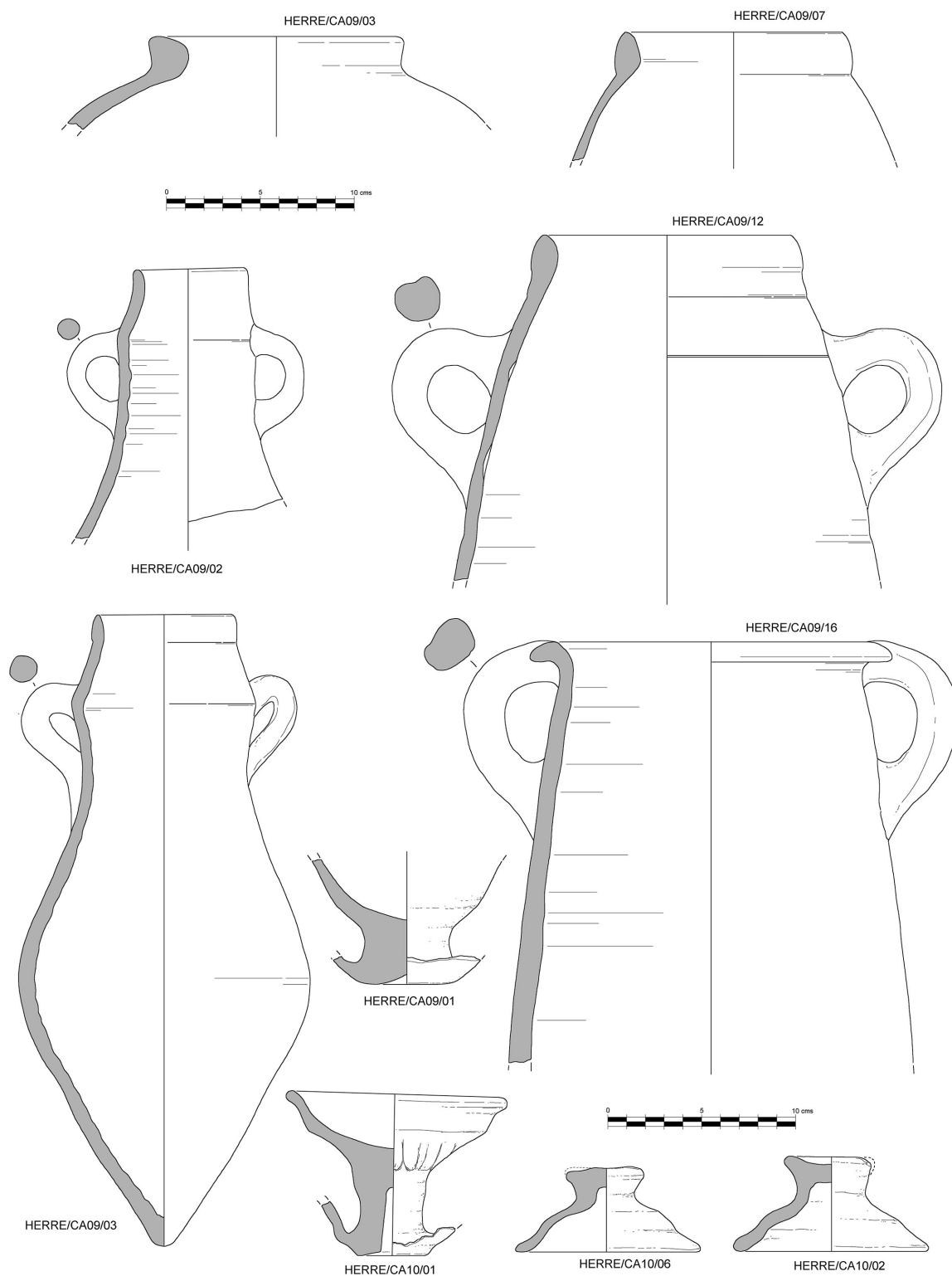
The evidence collected during the survey campaigns undertaken in 2008–2010 is limited in quantitative terms, but can nevertheless be used to contribute to long-standing debates on the archaeological geography

of the Phoenician and Punic periods in La Caleta and its surroundings. Unlike previous archaeological projects, the focus of our campaigns was not on isolated items characterized by their outstanding artistic features, but rather on modest ceramic pieces, largely fragmentary, which provide insights into hitherto-neglected aspects of the history of the area. Although there is a large number of dippers, incense burners (saucers) and miniature amphoras, a significant proportion of the remains recorded would not have been related to cult activities or the deposition of offerings, for example transport amphoras and *pithoi*. The massive presence in almost all locations of these items suggest that the traditional narrative on the underwater archaeological record in the Archaic period in La Caleta and its immediate environment should be revised. The assemblages provide the first reliable image of commercial maritime traffic along the north-west coast of Gadir, with evidence dating from at least the 7th century BC.

Overall, the evidence collected supports the idea that the channel of La Caleta and its surroundings operated as a major harbour during the Phoenician and Punic periods. Although no structural remains that can be related to port activities have been found, there is little doubt that the channel formed by the old course of the Guadalete River was an active harbour (Ponce, 1985; Arteaga *et al.*, 2001 and 2008; for the Roman period see Bernal, 2012). Also, the results of the 2008–2010 campaign seem to confirm the existence of a series of islets to the west, north and east, which are no longer visible owing to erosion, but which functioned as a protective barrier for some of the harbour areas surveyed—from La Cepera to Chapitel, Los Cochinos, Las Puercas, etc. (Alonso *et al.*, 2009, 2015). These eroded islets would likewise have played an important role for mooring around Canal del Sur, which was probably an area of lively commercial activity. Until the islets, the associated sandbanks, mudflats and the palaeo-coast of Erytheia and of northern Kotinoussa are defined with more precision, little more can be said about the use of the channel and its surroundings as a harbour.

The activity of the port must have also been closely related to the sacred areas and sanctuaries located at the western end of both promontories that delimit the channel of La Caleta. The purpose of this work is, on the basis of a limited volume of evidence, neither to offer a final solution to the geoarchaeological debate, nor to terminate discussion about the functionality and use of the sacred Phoenician areas of La Caleta, but rather to present alternative hypotheses and suggest future avenues of research.

In recent decades, the origin and function of the pre-Roman material recorded in the area has been at the centre of an intense debate. On the one hand, most researchers have interpreted miniature amphoras, incense burners and other small ceramic items, as well as the terracotta objects and the *thymiaterion*



*Figure 11.* Selection of the finds recorded at Laja Herrera: local Phoenician T-10121 (HERRE/CA09/03) and Punic T-11210 (HERRE/CA09/07) and T-8211 (HERRE/CA09/12) amphoras, miniature amphoras (HERRE/CA09/02-03), pithoi (HERRE/CA09/16), incense-burners (HERRE/CA09/01 and CA10/01) and lids (HERRE/CA10/02 and 06) (drawings by the authors).

of Punta del Nao, as offerings connected with the presence of the sanctuaries, especially the sanctuary consecrated to Astarte-Venus on the shores of Erytheia (Corzo, 1983, 1991 and 1999; López and García, 1985; Escacena, 1985; Álvarez, 1997). Terracotta discs, which are potentially connected with possible model chariot wheels, and other singular objects such as a group of statuettes that represent female worshippers, were similarly interpreted as being related to rituals that took place in this area, maybe even in the course of formal ritual maritime processions (Pérez López, 1998). On the other hand, some researchers have pointed out the possibility that these pieces, and other materials also traditionally associated with ceremonial activities, could come from a shipwreck located somewhere in the area of Punta del Nao (Ramírez, 1982; Ramírez and Mateos, 1985, 1992, 1994). Solutions that fall halfway between these opposing views have also been proposed; for example, although many of the items dating to the Phoenician period appear to have a ceremonial purpose, the same areas have also yielded abundant amphoras and other non-ritual objects; thus, the long chronological range represented by the record is suggestive of *longue durée* phenomena taking place in the bay, as well as of the possible presence of shipwrecks (Muñoz, 1993: 332–333).

The results of the 2008–2010 campaigns can be used to present an alternative hypothesis on the origin of at least some of these ceremonial or cult items. Previously the role of coastal erosion, and the possibility that some of the material found on the seabed may come from eroded coastal contexts, has been largely overlooked. If there is one point on which researchers investigating the geoarchaeology of the area of La Caleta agree (Corzo, 1980; Arteaga *et al.*, 2001; Alonso *et al.*, 2009), it is that the coast has receded considerably over the course of the past three millennia. The coast has eroded away and left exposed many rocky areas, including the sectors surveyed in 2008–2010 and almost all of the promontories that link Punta del Nao and the castle of Santa Catalina. Looting and the use of these areas as stone quarries have also contributed to their degradation and the transformation of the Phoenician seascape. This phenomenon has been abundantly attested in other sectors of the oceanic coast of Kotinoussa, especially in the area of Sancti Petri, the southernmost headland of the island of Cadiz, and the sanctuary devoted to Melqart/Hercules Gaditanus located in its surroundings (Sáez and Díaz, 2012).

Recent research suggests that the areas on which our survey focused may have encompassed a set of coastal islets that sheltered sectors of the north-western coast of Erytheia during the Phoenician period (Alonso *et al.*, 2009). Similarly, the recent publication of the first results of the excavation conducted in the Castle of San Sebastián has stressed the role played by coastal erosion on the topography of this land strip and on the possible loss of key ancient archaeological features (Maya *et al.*, 2014: 156–164). At the same time, new

evidence concerning the chronology of Archaic and Punic funerary remains found in Erytheia, near the castle of Santa Catalina and Punta del Nao, challenge the traditional narrative that this sector of ancient Cadiz was used only for religious purposes. The latest evidence suggests that this area of the northern island, beyond the so-called Stream of la Zanja, may have been used also as a necropolis from the 8th century BC onwards (Sáez and Belizón, 2014).

The ceramic artefacts identified over the course of the 2008–2010 campaigns and the revision of the chronology of types such as dipper juglets and incense burners indicate that this coastal area was actively in use in the 7th and 6th centuries BC. Furthermore, the presence of these typologies in domestic/industrial (Teatro Cómico, Calle Ancha, Calle Cánovas, Castillo de Doña Blanca, etc.) and funerary contexts (necropolis of Las Cumbres, insular cremation necropolis, etc.), along with the geoarchaeological evidence and the presence of funerary remains in the area, mean that it is doubtful these items were exclusively used for cult or ceremonial purposes. Incense burners, dipper juglets and even oil bottles are relatively common items in all sorts of Archaic contexts found around the bay (Fig. 12). A similar scenario can be deduced for the case of items dating to the 5th–2nd centuries BC, such as miniature amphoras, double-saucer incense burners, finewares, cooking pots, *askoi*, etc., that can be found not only in kiln sites but also in funerary pits, residential areas and fish-processing facilities. As well as the possibility that some of these objects were tossed overboard as offerings, or were the cargo of a possible shipwreck, the hypothesis that some were originally deposited in land sites that were later eroded away into the sea should be considered.

The possibility that some of the underwater finds may come from eroded funerary areas must also be taken into account. The presence of funerary contexts on the coast of Erytheia between Punta del Nao and Calle Hércules is suggested by the artefacts recovered from the adjacent seabed. Similar dynamics of erosion affecting funerary areas have been attested further south on the coast of Kotinoussa, near the modern beach of Santa María del Mar. In recent decades, the receding cliffs in this area have yielded different finds related to possible shaft graves and Archaic, Punic and Roman burials that have been washed into the sea (Muñoz, 1997 and 2008; García Alfonso, 2005; Torres, 2010; Niveau, 2015). Similarly, at La Caleta at least some of these items may be the result of the erosion of archaeological features (buildings, pits, etc.) related to the sanctuaries of Baal Hammon/Kronion and Astarte, traditionally situated at both ends of the rocky arms that surround the channel of La Caleta. The similarities between the material recorded during our survey and those recently excavated in San Sebastián fort reveal direct typological parallels (T-10121 amphoras, *pithoi*, dippers, oil bottles, etc.), providing support for this theory.





Figure 12. a) Miscellany of small pottery finds discovered in the 2008–2010 surveys: incense-burners, lids, small plate, ‘*piatto a bugia*’, and the fragment of sculptural terracotta (photo by A. Higuera-Milena); b) local and imported ‘dipper juglets’ found in several locations around La Caleta (after Sáez and Higuera-Milena, 2016a: 134, fig 7) (photo by A. Higuera-Milena).

Therefore, the material recorded on the surface or in the upper layers of the surroundings of Punta del Nao, the rocky environment nearby Santa Catalina and the reefs and mudflats around Canal del Sur/La Cepera could be the result of a combination of marine erosion and various human activities developed in the area. On the one hand, intensive maritime-commercial traffic, which included mooring, consumption on board and on the land facilities, and probably the sinking of a significant number of ships; on the other, the continuous use of the areas surrounding the main channel as sacred shrines and funerary grounds, activities that would have been developed largely at the seafront and thus would have generated structures and material assemblages that could have been partially or entirely erased by coastal erosion during the past two millennia. The different states of preservation of the items recorded illustrate their distinct contextual origins and the varied processes of deposition that they underwent in the area, as a result of the combination of both factors. For example, some seem to have been preserved in excellent stable conditions below silt or sandbanks, whereas many others are badly shattered and worn.

Another long-standing debate revolves around the chronology of the so-called ‘singular pieces’ and their relationship with the sanctuaries and the use of the channel as a harbour. One characteristic example of this is the capital found near the Castle of San Sebastián, the chronology of which has recently been revised and situated within a wide period spanning the 7th to 5th centuries BC (Marín and Jiménez, 2011; Maya *et al.*, 2014); the terracotta sculptures, dated to between the Archaic period and the 5th century, and the *thymiaterion* of Punta del Nao illustrate the difficulty of assigning a precise chronology to these remains, due to the lack of contextual and stratigraphic information. The most common ceramic ‘offerings’ present a similar case, including the types most frequently found in La Caleta, that are miniature amphoras, dippers and incense burners. The provenance and chronology of

these items have remained very imprecise, and most authors have been overly cautious, dating them between the 7th and 2nd centuries BC. The contextual data collected from nearby land sites seem to be the only way out of this situation, as these data provide evidence of the local production of some of these series. Following this methodology, a first test-case has been recently studied concerning double-saucer incense burners, suggesting that almost all the examples recorded at La Caleta must be dated to the 5th–4th centuries BC (Sáez and Higuera-Milena, 2016c). Similar research is in progress focusing on the miniature amphoras and the dipper juglets, combining a typological approach with provenance and residue analysis, to determine the contents of both groups.

Concerning the use of these areas for commercial purposes, the results of the 2008–2010 campaign are quite eloquent. The finds in La Cepera, Canal del Sur and Laja Herrera, including amphoras, *pithoi* and perhaps other ceramics dating to the 7th and 6th centuries leave little room for doubt concerning the use of this area by Phoenician ships on their way in or out of the bay. The presence of Punic amphoras is just as revealing, indicating the great intensity of the sea traffic generated by Gadir and its bay between the 5th and the 3rd centuries BC. The evidence attests to both the export of fish products in local containers (mainly T-11213, T-12111 and T-8211 types) and the import of foreign products that could have been either consumed in the bay or redistributed thence (regional T-11216, T-12111, Carthaginian T-7421, etc., containing other fish products, olive oil and wine).

The evidence provided by the 2008–2010 campaigns supports the intriguing previous data on the presence in the area of a massive quantity of transport amphoras dating from the 5th century BC to the early Roman period (Vallespín, 1985; Alonso *et al.*, 1991; Muñoz, 1993; Sáez *et al.*, 2016), and confirm Gadir’s regional importance in connecting Atlantic maritime routes with the main Mediterranean markets. The archaeological sequence suggested by the amphoras found at La

Caleta correlates with the record of many industrial and funerary sites excavated on the island of Cadiz (Muñoz, 1997; Sáez, 2008; Niveau 2009; Belizón and Sáez, 2016), and also with the available information about the amphoras consumed at the walled town of Castillo de Doña Blanca (Ruiz and Pérez, 1995; Niveau, 1999). Considering the data as a whole, the presence of Archaic material in La Caleta waters could indicate a first phase of commercial expansion of Gadir during the 7th–6th centuries BC; also, it is eloquent of the important transformations developed after the mid 6th century BC and the rise of the fish-processing business in the western Punic cities. Trade in fish by-products turned into a major economic pillar for Gadir and other Punic coastal sites, and allowed local elites to reach remarkable levels of wealth and maintain international connections during the 5th–3rd centuries BC. The Roman conquest in 206 BC reinforced this tendency by linking the city harbour into Roman maritime trading routes, which also could help to explain the presence in La Caleta and other sites around the bay of a significant quantity of Dressel 1 amphoras and other Central and Eastern Mediterranean imports dating from the 2nd–1st centuries BC (Bernal *et al.* 2013).

The new evidence presented in this article and the debates outlined are, in our opinion, a clear reflection of the still embryonic state of scientific research in the area; more continuity and interdisciplinary approaches

are necessary. The geophysical and geoarchaeological survey must be intensified, especially, perhaps, around Canal del Sur and Punta del Nao. These activities should be oriented towards the examination of the palaeo-landscape of the former entrance channel between the coast and the possible string of islets in La Cepera, Chapitel, Laja Herrera, Los Cochinos, Las Puercas, and so on, and the nearby shelter area around the promontory of Santa Catalina-Punta del Nao. Concerning the shoals of Chapitel and Laja Herrera, there is a clear need to continue with the geophysical survey, to examine the resulting anomalies visually, and to expand both the areas covered and the techniques employed to include intensive survey and open-area excavation. Also, the abundance of archaeological materials in areas such as La Cepera, Punta del Nao or Canal del Sur suggests that visual survey must be extended. A detailed exploration of the anomalies detected in the geophysical prospection carried out in 2008 must take place, and stratigraphic excavation should confirm the magnitude of different sectors within sites, as well as the presence or absence of remains of timber, which could be indicative of shipwrecks, or of eroded structures. Finally, in order to ascertain the presence of shipwrecks, previously known sites should be explored and excavated, for example the so-called ‘Juan Villa’s Punic shipwreck’, the only reliable location of a pre-Roman wreck known in the area at present.

## Acknowledgements

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## References

- Alonso, C., 1991, Informe de la campaña de prospecciones subacuáticas en la zona noroeste de la Playa de La Caleta (Cádiz). *Anuario Arqueológico de Andalucía* 1989, vol. II, 329–330.
- Alonso, C., Florido, C. and Muñoz, A., 1991, Aproximación a la tipología anfórica de la Punta del Nao (Cádiz, España), in *II Congresso Internazionale di Studi Fenici e Punici*, 601–616. Rome.
- Alonso, C., Gallardo, M., García, C., Puebla, J. and Zambrano, L.C., 1999, Proyectos de tutela del Patrimonio Arqueológico Subacuático realizados por el Centro de Arqueología Subacuática. *PH Boletín* 26, 130–137, Seville.
- Alonso, C., Gracia, F.J. and Benavente, J., 2009, Evolución histórica de la línea de costa en el sector meridional de la Bahía de Cádiz. *Revista Atlántica-Mediterránea de Prehistoria y Arqueología Social* 11, 13–37.
- Alonso, C., Gracia, F. J., Rodríguez-Polo, S. and Martín Puerta, C., 2015, El registro de eventos energéticos marinos en la Bahía de Cádiz durante épocas históricas. *Cuaternario y Geomorfología* 29 (1–2), 95–117.
- Arteaga, O., Kölling, A., Kölling, M., Roos, A.M., Schulz, H. and Schulz, H.D., 2001, El Puerto de Gadir. Investigación Geoarqueológica en el casco antiguo de Cádiz. *Revista Atlántico-Mediterránea de Prehistoria y Arqueología Social* 4, 345–415.
- Arteaga, O., Schulz, H.D. and Roos, A.M., 2008, Geoarqueología dialéctica en la Bahía de Cádiz, in O. Arteaga and H.D. Schulz (eds), *Geoarqueología y proceso histórico en la Bahía de Cádiz*. *Revista Atlántico-Mediterránea de Prehistoria y Arqueología Social* 10, 21–116.
- Astillero, J.M. and Garófano, R., 2003, *Las costas de Cádiz desde el cielo*. Cádiz.
- Aubert, M.E., 2009, *Tiro y las colonias fenicias de Occidente. Tercera edición actualizada y ampliada*. Barcelona.
- Álvarez Rojas, A., 1992, Sobre la localización del Cádiz fenicio. *Boletín del Museo de Cádiz* V, 17–30.
- Álvarez Rojas, A., 1997, ¿Auletris gaditana? Notas sobre una figura en terracota del Museo de Cádiz. *Boletín del Museo de Cádiz* VII, 107–113.

- Alzaga, M., Martí, J., Navarro, M. and Rodríguez, N., 1999, Documentación y análisis del riesgo antrópico del Patrimonio Arqueológico subacuático de Andalucía. *PH Boletín* 26, 122–129.
- Belén Deamos, M., 2000, Itinerarios arqueológicos por la geografía sagrada del lejano Occidente, in B. Costa and J.H. Fernández (eds), *Santuarios fenicio-púnicos en Iberia y su influencia en los cultos indígenas. XIV Jornadas de Arqueología Fenicio-Púnica* (Eivissa, 1999), 57–102. Treballs del Museu Arqueològic d'Eivissa i Formentera 46.
- Belizón, R. and Sáez Romero, A., 2016, Peces Dorados. Un avance sobre recientes descubrimientos en la necrópolis fenicia y púnica de Gadir (Cádiz, España). *Arqueología Iberoamericana* 32, 3–10.
- Bernal Casasola, D., 2012, El puerto romano de Gades. Novedades arqueológicas, in S. Keay, (ed.) *Rome, Portus and the Mediterranean*, 225–244. British School at Rome. Archaeological Monographs 21.
- Bernal Casasola, D., García Vargas, E. and Sáez Romero, A. M., 2013, Ánforas itálicas en la Hispania meridional y en el Círculo del Estrecho, in G. Olcese (ed.) *Ricerche archeologiche, archeometriche e informatiche per la ricostruzione dell'economia e dei commerci nel bacino occidentale del Mediterraneo (metà IV sec. a.C.–I sec. d.C.)*, 351–372. Immensa Aequora 3, Rome.
- Blanco Freijeiro, A., 1960, El capitel de Cádiz. *Zephyrus* XI, 157–159.
- Blanco Mínguez, M.C., 1970, Nuevas piezas fenicias del Museo Arqueológico de Cádiz. *Archivo Español de Arqueología* 43, 50–61.
- Botto, M., 2014, Los fenicios en la Bahía de Cádiz: estrategias de poblamiento y de aprovechamiento del territorio, relaciones con el mundo indígena, comercio (siglo IX–finales del siglo VII/inicios del VI a.C.), in M. Botto (ed.), *Los Fenicios en La Bahía de Cádiz. Nuevas investigaciones*, 265–281. Collezione di Studi Fenici 46, Rome.
- Bueno Serrano, P., 2014, Un asentamiento del Bronce Final—Hierro I en el Cerro del Castillo, Chiclana, Cádiz. Nuevos datos para la interpretación de Gadeira, in M. Botto (ed.), *Los Fenicios en La Bahía de Cádiz. Nuevas investigaciones*, 225–251. Collezione di Studi Fenici 46, Rome.
- Corzo, R., 1980, Paleotopografía de la provincia de Cádiz. *Gades* 5, 5–14.
- Corzo, R., 1983, Cádiz y la arqueología fenicia. *Anales de la Real Academia Provincial de Bellas Artes de Cádiz* 1, 5–29.
- Corzo, R., 1991, Cádiz fenicia, in *I–IV Jornadas de Arqueología Fenicio-Púnica* (Eivissa, 1986–1989), 79–88. Trabajos del Museo de Ibiza y Formentera 24, Ibiza.
- Corzo, R., 1999, *Venus Marina Gaditana*. Seville.
- Escacena, J.L., 1985, Gadir. *Aula Orientalis* 3, 39–58.
- Ferrer Albelda, E., 2002, La religión de época púnica en Iberia: lugares de culto, in E. Ferrer (ed.), *Ex Oriente Lux. Las religiones orientales antiguas en la Península Ibérica*, 185–218. Seville.
- Frutos, G. and Muñoz, A., 2008, La incidencia antrópica del poblamiento fenicio-púnico desde Cádiz a Sancti Petri. *Revista Atlántica-Mediterránea de Prehistoria y Arqueología Social* 10, 237–266.
- Gallardo, M., García Rivera, C., Alonso, C. and Martí, J., 1995, Carta arqueológica Subacuática de la Bahía de Cádiz. *Cuadernos de Arqueología Marítima* 3, 105–124.
- Gallardo, M., García Rivera, C., Alonso, C., Martí, J., Ramírez, J.R. and Sáenz, M.A., 1994, Prospección arqueológica subacuática en Sancti Petri (Cádiz). *Anuario Arqueológico Andaluz/1992, vol. II. Actividades Sistemáticas*, 79–88.
- Gallardo, M., Martí, J., Alonso, C. and García, C., 1999, Prospecciones arqueológicas subacuáticas en Sancti Petri. Proyecto general de investigación de la Bahía de Cádiz 'Carta Arqueológica Subacuática'. *Anuario Arqueológico de Andalucía/1995, vol. II*, 15–25.
- García Alfonso, E., 2005, Consideraciones sobre la pyxis de la playa de Santa María del Mar (Cádiz), in S. Celestino and J. Jiménez (eds), *El Periodo Orientalizante. Actas del III Simposio Internacional de Arqueología de Mérida* (Mérida, 2003), vol. II. *Anejos de Archivo Español de Arqueología* 35, 1323–1333.
- García y Bellido, A., 1971, Parerga de Arqueología y Epigrafía Hispano-romana. IV, *Archivo Español de Arqueología* 44 (123–124), 137–152.
- Gener Basallote, J.M., Jurado Fresnadillo, G., Pajuelo Sáez, J.M. and Torres Ortiz, M., 2014, El proceso de sacralización del espacio en Gadir: el yacimiento de la Casa del Obispo (Cádiz). Parte I, in M. Botto (ed.), *Los Fenicios en La Bahía de Cádiz. Nuevas investigaciones*. 123–155. Collezione di Studi Fenici 46, Rome.
- González, H., Higuera-Milena, A. and Sáez Romero, A.M., 2016, Importaciones efesias en Cádiz: Nuevos hallazgos de la Punta Del Nao (La Caleta). *Saguntum* 48, 129–140.
- Gutiérrez López, J.M., 2000, Aportaciones a la producción de salazones de Gadir: la factoría púnico-gaditana Puerto 19. *Revista de Historia de El Puerto* 24, 11–46.
- Higuera-Milena Castellano, A., forthcoming, Actividad Arqueológica Puntual de aplicación experimental de técnicas geofísicas para la localización, investigación y difusión del patrimonio arqueológico en la zona de La Caleta (Cádiz). *Anuario Arqueológico de Andalucía/2008*.
- Higuera-Milena Castellano, A. and Sáez Romero, A., 2014, Aplicación experimental de técnicas geofísicas para la localización, investigación y difusión del patrimonio arqueológico en la zona de La Caleta (Cádiz), in X. Nieto and M. Bethencourt. (eds), *Arqueología Subacuática Española. Actas del I Congreso de Arqueología Náutica y Subacuática Española*, vol. II, 275–286.
- Higuera-Milena Castellano, A. and Sáez Romero, A., forthcoming, La circulación de productos envasados en ánforas en la Gades republicana: nuevos datos procedentes de contextos subacuáticos de La Caleta (Cádiz), in H. Uroz and A. Ribera (eds), *Congreso Internacional 'Cultura material romana en la Hispania Republicana. Contextos privilegiados y estado de la cuestión' Lezuza, Albacete, 22–24 April 2016*.
- Jiménez Flores, A.M., 2007, Las imágenes en el servicio de culto: acerca del 'supuesto' timiaterio de Punta del Nao. *Habis* 38, 61–78.
- López de la Orden, M.D. and García Rivera, C., 1985, Ánforas púnicas de la Caleta, Cádiz, in *VI Congreso Internacional de Arqueología Submarina, Cartagena, 1982*, 393–397. Madrid.



- Marín Ceballos, M.C. and Jiménez Flores, A.M., 2011, El capitel protoeólico de Cádiz, in M.C. Marín Ceballos (ed.), *Cultos y ritos de la Gadir fenicia*, 207–220. Cádiz.
- Martí Solano, J., 2010, Prospecciones y sondeos arqueológicos en el yacimiento subacuático de Bajos de Chapitel. Bahía de Cádiz, *Anuario Arqueológico de Andalucía* 2006, 628–643. Cádiz.
- Martí Solano, J., 2014, Actuaciones en Andalucía en desarrollo del Plan Nacional de Arqueología Subacuática, in X. Nieto and M. Bethencourt (eds), *Arqueología Subacuática Española. Actas del I Congreso de Arqueología Náutica y Subacuática Española*, vol. II, 775–787. Cádiz.
- Martí Solano, J. and Rodríguez, N., 2003, Problemática y situación actual de la arqueología subacuática en la Bahía de Cádiz. *Monte Buciero* 9, 397–416.
- Maya Torcelly, R., Jurado, G., Gener, J.M., López, E. and Torres Ortiz, M., 2015, ‘Nuevos datos sobre el Kronion de Gadir: resultados de la intervención arqueológica en el castillo de San Sebastián (Cádiz)’, in *VII Encuentro de Arqueología del Suroeste Peninsular*, 429–451. Aroche (Huelva, Spain).
- Muñoz Vicente, A., 1992, En tomo a seis *askoi* zoomorfos de la necrópolis púnica de Cádiz. *Boletín del Museo de Cádiz* V, 7–15.
- Muñoz Vicente, A., 1993, Las cerámicas fenicio-púnicas de origen submarino del área de La Caleta (Cádiz). *Cuadernos de Prehistoria y Arqueología Castellonenses* 15, 297–334.
- Muñoz Vicente, A., 1997, Secuencia histórica del asentamiento fenicio-púnico de Cádiz: un análisis crono-espacial tras quince años de investigaciones arqueológicas. *Boletín del Museo de Cádiz* VII, 77–105.
- Muñoz Vicente, A., 2008, Topografía y ritual en la necrópolis fenicio-púnica de Cádiz, in F. J. Guzmán and V. Castañeda (eds), *Vida y muerte en la Historia de Cádiz*, 57–84. Chiclana.
- Niveau de Villedary, A.M., 1999, Ánforas turdetanas, mediterráneas y púnicas del s. III del Castillo de Doña Blanca (El Puerto de Santa María, Cádiz), *XXIV Congreso Nacional de Arqueología*, vol. 3, 133–140. Murcia.
- Niveau de Villedary, A.M., 2009, *Ofrendas, banquetes y libaciones. El ritual funerario en la necrópolis púnica de Cádiz*. Spal Monografías XII, Seville.
- Niveau de Villedary, A.M., 2015, La estructuración del espacio urbano y productivo de Gadir durante la fase urbana clásica. Cambios y perduraciones. *Complutum* 26.1, 225–242.
- Orsingher, A., 2010, Le oil bottles fenicie: analisi dei contesti e considerazioni crono-tipologiche. *Sardinia, Corsica et Baleares Antiquae* 8, 37–69.
- Pemán, C., 1959, El capitel de tipo protojónico de Cádiz. *Archivo Español de Arqueología* 32, 58–70.
- Pérez Hormaeche, E., 1990, Arqueología Gaditana I: quemaperfumes púnicos. *Gades* 19, 9–23.
- Pérez Hormaeche, E., 1993, Arqueología Gaditana II: ungüentarios púnicos. *Gades* 21, 261–268.
- Pérez López, I., 1998, *Los santuarios de la Baetica en la Antigüedad*. Cádiz.
- Ponce Cordones, F., 1985, Consideraciones en torno a la ubicación del Cádiz fenicio. *Anales de la Universidad de Cádiz* II, 99–121.
- Ramírez Delgado, J.R., 1982, Los primitivos núcleos de asentamiento en la ciudad de Cádiz. Cádiz.
- Ramírez Delgado, J.R. and Mateos Alonso, V., 1985, La arqueología subacuática en la bahía de Cádiz, in *Actas del VI Congreso Internacional de Arqueología Submarina, Cartagena, 1982*, 75–82. Madrid.
- Ramírez Delgado, J.R. and Mateos Alonso, V., 1992, Terracota negroide de la Punta del Nao (Cádiz). *Boletín del Museo de Cádiz* V, 31–36.
- Ramírez Delgado, J. R. and Mateos Alonso, V., 1994, Terracota orientalizante de la Punta del Nao (Cádiz). *Boletín del Museo de Cádiz* VI, 93–99.
- Ramon Torres, J., 1995, *Las ánforas fenicio-púnicas del Mediterráneo central y occidental*. Barcelona.
- Ramon Torres, J., 2010, La cerámica fenicia del Mediterráneo centro-occidental y del Atlántico (s. VIII-1r 1/3 del siglo VI AC). Problemas y perspectivas actuales, in L. Nigro (ed.), *Motya and the Phoenician Ceramic Repertoire between the Levant and the West 9th–6th Century BC*, 211–53. Quaderni di Archeologia Fenicio-Punica 5, Rome.
- Ramon, J. Sáez, A., Sáez Romero, A.M. and Muñoz, A., 2007, *El taller alfarero tardoarcaico de Camposoto*. Seville.
- Rodríguez, N. and Martí, J., 2001, Actuación arqueológica subacuática en los bajos al noroeste de la ciudad de Cádiz. *Boletín PH* 36, 75–82.
- Romero de Torres, E., 1934, *Catálogo Monumental de España. Provincia de Cádiz (1908–1909)*. Madrid.
- Ruiz Mata, D. and Pérez C.J., 1995, *El poblado fenicio del Castillo de Doña Blanca (El Puerto de Santa María, Cádiz)*. El Puerto de Santa María.
- Sáez Romero, A.M., 2006, Uso y producción de *askoi* en Gadir. Una posible evidencia del culto a Tanit, in A. Akerraz, P. Ruggeri, A. Siraj and C. Vismara (eds), *L’Africa Romana XVI. Mobilità delle persone e dei popoli, dinamiche migratorie, emigrazioni ed immigrazioni nelle province occidentali dell’Impero romano*, 613–634. Rome.
- Sáez Romero, A.M., 2008, *La producción cerámica en Gadir en época tardopúnica (siglos–III-I)*. BAR International Series 1812, Oxford.
- Sáez Romero, A.M., 2014, Fish Processing and Salted-Fish Trade in the Punic West: New Archaeological Data and Historical Evolution, in E. Botte and V. Leitch (eds), *Fish & Ships: Production et commerce des salsamenta durant l’Antiquité*, 159–74. Bibliothèque d’Archéologie Méditerranéenne et Africaine 17. Aix-en-Provence.
- Sáez Romero, A.M. and Belizón Aragón, R., 2014, Excavaciones en la calle Hércules, 12 de Cádiz. Avance de resultados y primeras propuestas acerca de la posible necrópolis fenicia insular de Gadir, in M. Botto (ed.), *Los Fenicios en La Bahía de Cádiz. Nuevas investigaciones*, 181–201. Collezione di Studi Fenici 46, Rome.
- Sáez Romero, A.M. and Díaz, J.J., 2012, Entre tierra y mar, entre lo púnico y lo romano. Adaptaciones económicas y territoriales en un medio cambiante: algunas notas sobre paleogeografía y sistemas de explotación del hinterland insular de Gadir/Gades, in B. Mora and G. Cruz (eds), *La etapa neopúnica en Hispania y el Mediterráneo centro occidental: identidades compartidas*, 259–300. Serie Historia y Geografía 246, Seville.

- Sáez Romero, A. and Higuera-Milena, A., 2016a, Cerámicas fenicias arcaicas de procedencia subacuática del área de La Caleta (Cádiz): ensayo de contextualización e interpretación histórica. *Cuadernos de Prehistoria y Arqueología de la Universidad Autónoma de Madrid*, **42**, 119–142.
- Sáez Romero, A. and Higuera-Milena, A., 2016b, Nuevas investigaciones arqueológicas subacuáticas en el área de La Caleta (Cádiz, España). Estudio de las evidencias de época púnica. *Lucentum* **36**, 9–41.
- Sáez Romero, A. and Higuera-Milena, A., 2016c, Pebeteros inéditos de época fenicio-púnica procedentes de La Caleta (Cádiz): Estudio de las piezas y consideraciones historiográficas. *Revista Atlántico-Mediterránea de Prehistoria y Arqueología Social* **18**, 61–74.
- Sáez Romero, A., González, H. and Higuera-Milena, A., 2016, Una aportación al estudio del comercio marítimo antiguo gaditano a partir de un conjunto de ánforas halladas en aguas del área de La Caleta (Cádiz). *Onoba: Revista de Arqueología y Antigüedad* **4**, 3–18.
- Torres Ortiz, M., 2010, Sobre la cronología de la necrópolis fenicio arcaica de Cádiz, in A.M. Niveau and V. Gómez (eds), *La necrópolis de Cádiz. Apuntes de arqueología gaditana en homenaje a J.F. Sibón*, 31–67. Cádiz.
- Torres Ortiz, M., López, E., Gener, J.M., Navarro, M.A. and Pajuelo, J.M., 2014, El material cerámico de los contextos fenicios del 'Teatro Cómico' de Cádiz: un análisis preliminar, in M. Botto (ed.), *Los Fenicios en La Bahía de Cádiz. Nuevas investigaciones*, 51–82. Collezione di Studi Fenici 46, Rome.
- Vallespín Gómez, O., 1977, Prospecciones submarinas en Cádiz. Agosto 1973. *Noticiario Arqueológico Hispánico, Arqueología* **5**, 289–292.
- Vallespín Gómez, O., 1985, Carta Arqueológica de La Caleta, in *Actas del VI Congreso Internacional de Arqueología Submarina* (Cartagena, 1982), 59–74. Madrid.
- Vallespín Gómez, O., 2000, La Caleta, puerto antiguo de Cádiz, in M.E. Aubet and M. Barthélemy (eds), *Actas del IV Congreso Internacional de Estudios Fenicios y Púnicos*, vol. II, 915–921. Cádiz.
- Zimmerman-Munn, M.L., 2003, Corinthian trade with the Punic west in the Classical period, in C.K. Williams II and N. Bookidis (eds) *Corinth. The Centenary 1896–1996*, 195–217. Princeton, NJ.