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PORT TOPOGRAPHY IN ATLANTIC AND MEDITERRANEAN HISPANIA

Abstract: Nowadays, the study of ports in Hispania has a firmly established line of research highlighting the port configuration of numerous Atlantic and Mediterranean cities. Within this context, along the coasts of the Iberian Peninsula—as well as in the course of the main rivers—the port settlements that mark the water from the Mediterranean to the Cantabrian Sea have a series of structures or environments whose architectural elements seem to follow standard patterns in their structural systems and location that are perpetuated throughout their evolution. The common need to solve the various problems caused by maritime traffic and port activity linked to the commercial networks of an increasingly complex provincialized imperial economy seems to lie in their endowment.

Keywords: *port, dock, wharf, lighthouse, Horrea.*

PORTS IN ANCIENT TIMES: RESEARCH AND KNOWLEDGE

The historical and archaeological knowledge of ports in the ancient world means a widely developed line of work in the most recent scientific literature, which demonstrates the interest that this subject awakens. The classical period is one of the moments in which the ports gained importance; the port network developed by Rome in the provinces and the port districts of the Italic Peninsula meant the period of most significant development in these terms. Some examples are the numerous research projects in Eastern Mediterranean ports, such as Salamina —the Salamis Harbour Project— or Piraeus —Zea Harbour Project,¹ Corinth —Lechaion Harbour Project—,² Patara —Patara Harbour Project—,³ Naukratis in the Dor's Bay area⁴ and Aenos.⁵

In all these settlements, wide research projects and underwater and terrestrial archaeological activities are being carried out, obtaining important results on the configuration of these ports and the role played throughout history. In the Central Mediterranean, there is also significant research focused on distinguished port settlements. This is the case of port areas such as *Ostia* and *Portus* (Rome, Italy), which are the best model for understanding this phenomenon in the ancient Mediterranean, a vital economic centre for the subsistence of the Empire. In recent years, other research highlighted

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¹ LOVÉN 2011; LOVÉN/SAPOUNTZIS 2014.

² GÜNGÖR/LOVÉN 2018.

³ KOÇAK 2015.

⁴ THOMAS *et alii* 2016; GILBOA/WAIM-BARAK/SHARON 2015.

⁵ LADSTÄTTER/PIRSON/SCHIDTS 2015.

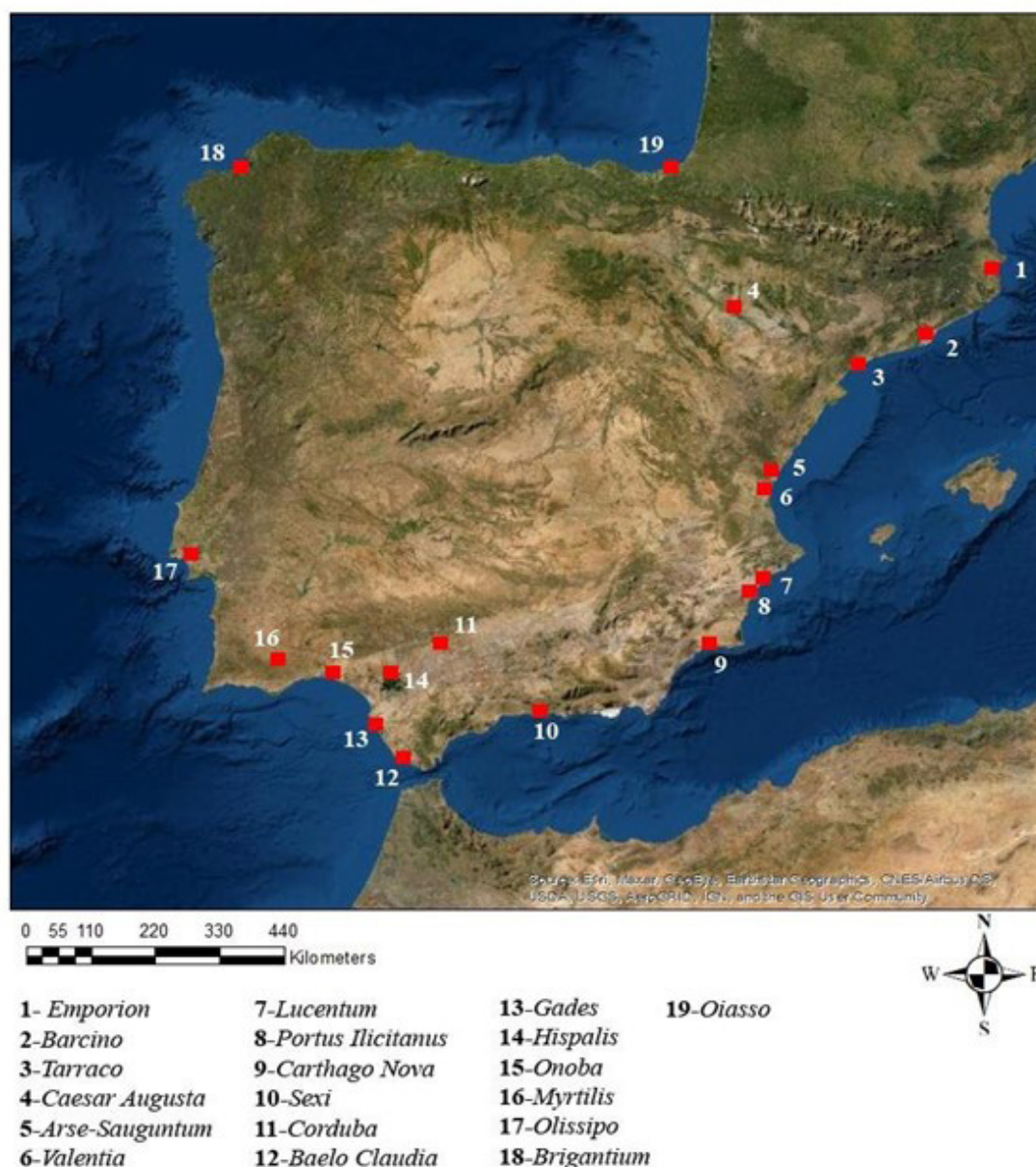


Fig. 1. Map with signs of the main Hispanic ports.

the role played by this port settlement,⁶ as well as different environments or infrastructures.⁷ Similarly, there are interesting studies about the port network of the ancient Istrian coastline.⁸ In the Western Mediterranean area, there are distinguished research projects about different things, which have allowed a deep knowledge about *Gallia Narbonensis* ports, such as *Narbo*, *Fossae Marianae* or *Areles*.⁹

Regarding the Hispanic coasts, research on port issues has a long history through specific investigations in distinguished settlements, such as Carthago Nova,¹⁰ as well as broader project frameworks that have highlighted the importance of the port districts in the Hispanic Southwest.¹¹

In the specific Hispanic case, research developed over the last decades reveals a primarily important outlook regarding the port configuration of cities in the different provinces.¹² The many archaeological testimonies reveal an important connection regarding the diffusion of architectural models and functional models and topographic planning aimed at solving specific needs related to maritime trade (Fig. 1).

The following study compiles the main Hispanic urban settlements that clearly show the remains of port environments, whether berthing or anchoring structures, as well as the elements that formed its port topography, warehouses, signalling elements, management buildings, etc. The list of settlements compiled in this work does not include those ports which today do not have remains that

⁶ KEAY *et alii* 2005; KEAY/PAROLI 2011; KEAY 2012.

⁷ BUKOWIECKI/MONTEIX/RUOSSE 2008; BUKOWIECKI/PANZIERE/ZUGMEYER 2011; CAMPOS/BERMEJO 2021.

⁸ KONCANI-UHAČ/AURIEMMA 2015.

⁹ SÁNCHEZ/JÉZÉGOU 2011.

¹⁰ CEREZO 2017.

¹¹ CAMPOS/BERMEJO 2017a; CAMPOS/BERMEJO 2021.

¹² Among others POCIÑA/REMOLÁ 2001; BEA 2004; RAMALLO/MARTÍNEZ 2010; SÁNCHEZ *et alii* 2010; ORDOÑEZ/GONZÁLEZ 2011; MELLINAD *et alii* 2011; COLOM 2013; SÁNCHEZ 2013; CHIOFFI 2013; CEREZO 2017; BERNAL *et alii* 2017; BERMEJO *et alii* 2017.

allow us to clearly define either its topography or its port environment. However, they played an essential role in ancient times, and undoubtedly, they must have had a whole group of infrastructures.

THE HISPANIC MARITIME AND FLUVIAL CITIES, TOPOGRAPHY, PORT ORGANISATION, AND THEIR MEDITERRANEAN CONNECTION

Here lies one of the main theoretical supports of our research, the diffusion in the provinces of certain architectural models (*horrea*, *lanternae*, *stationes*, docks, etc.) and its connection with the big Mediterranean and imperial ports, since these ports undoubtedly represent a focus of irradiation. In fact, under an increasingly feverish and commercial activity developed progressively from the beginning of the Imperial period and with a remarkable impact from the second century A.D., the provincialization of the economy, more specifically Hispanic, led to increasingly close relationships that largely determined the development of the port topography of these settlements. In fact, the main political measures developed from the middle of the first century A.D. and especially from Trajan onwards, aimed at reorganizing and structuring the *annona*, favoured gradually more intense relations between *Ostia/Portus* and the Atlantic port areas. The *annona* routes that departed from these ports had the Tyrrhenian coast as a clear commercial destination in a straightforward strategic design. All of this was with the clear intention of introducing a new rhythm in the economy and guaranteeing the supply of vital products to crucial sectors of the state, the urban markets, and the army, fundamentally. The attention that Trajan paid to these measures, whose most visible example today is the great construction of its port in *Portus*, the reorganization of a port complex on the Tyrrhenian coast (Centucellae, Terracina, Anzio) as well as a combination of legal provisions aimed at strengthening the supply of the

annona and the creation of *collegia*, allows us to understand, in this clear context, the development experienced by certain Hispanic ports.¹³ The transfer of goods was accompanied by ideas, solutions and techniques that were recurrently implemented, as can be seen in their analysis.

EMPORIAE (San Martín de Ampurias) (Fig. 1, no. 1)

Born under the shelter of the city of Phocaean origin and because of the settlement of a military camp,¹⁴ the port of *Emporiae* will stand out for its geostrategic location as a commercial node on the routes between the Italian and Iberian peninsulas as they pass through southern Gaul.

From a structural point of view, a part of the ancient dock/pier has been identified, built with two parallel rows of large stone blocks —between 1 and 3 metres on each side— with the interior filled with *caementum*, reaching dimensions of 82 metres long, 5'60 metres wide and 6'5 metres high (Fig. 2). Its construction is located between 195 and 150 B.C.¹⁵ in

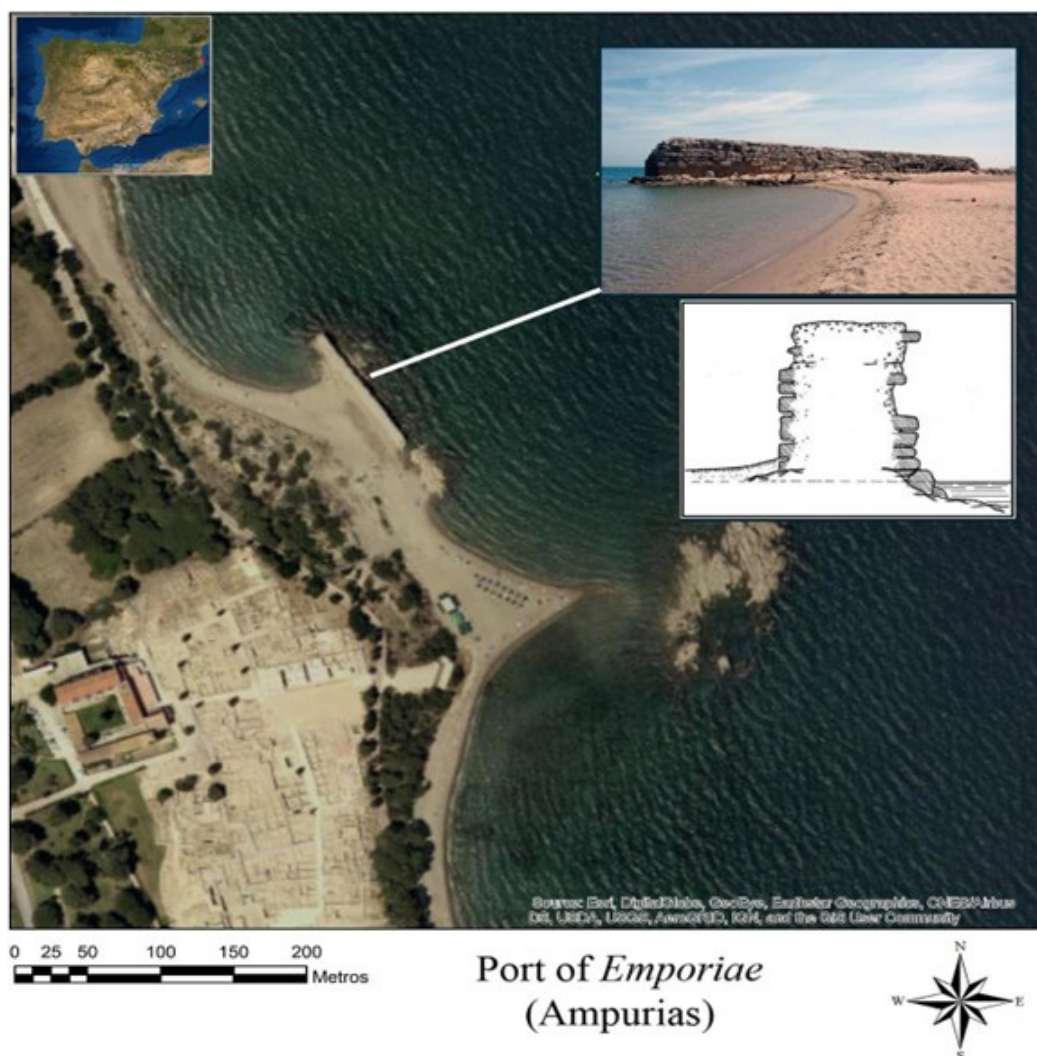


Fig. 2. Location of the port structures in the *Emporiae* port (after ALMAGRO BASCH 1962, 22).

¹³ BERMEJO/CAMPOS 2018, 10, 11.

¹⁴ ALMAGRO 1948; RIPOLL 1990, 170, 188.

¹⁵ ALMAGRO 1962.

the context of the urban and port growth in the city, which reached its peak between the first century B.C. and mid-first century A.D., as indicated by the growth rates of the small port settlements near the city.¹⁶

conditions of the cove defined it as a docking port for anchoring ships¹⁸ (Fig. 3).

Furthermore, to the finding of access to the wall oriented towards the sea, we can add the location of two impressive buildings on each side of this road and a

combination of *figlinae* in its *suburbium*, allowing us to propose the existence of a *portorium* or fiscal control area next to a port located between the current Ragomir and Montacada streets.¹⁹

This hypothesis is supported by the pictorial representations of the modern period port, where we can see a possible wall of *opus caementicium* under the late medieval tower of Puerta del Mar,²⁰ as well as the apparent amortization of the Maians island with the modern port, which could have been connected to the previous *caementum* wall forming a pier or artificial dock, constituting one of the protective elements mentioned by *Avienus* (*Ora maritima*, 520-522) and may even hold a lighthouse or luminaire.²¹



Fig. 3. Location of the *Barcino* port and its hypothetical urban position with signs of some of the documented structures (after JÁRREGA DOMÍNGUEZ 2013, Fig. 3; Servei d'Arqueologia de Barcelona)

BARCINO (Barcelona) (Fig. 1, no. 2)

Under the current Barcelona we can find the remains of the Roman colony, whose earliest evidence is from the last decade of the first century B.C. Unfortunately, that evidence relating to its port network is practically non-existent.¹⁷ The geological research in that area suggests that the ancient coastline must not have been the perfect context for the construction of an artificial harbour because of the presence of sandy masses, although it is not excluded that the natural

TARRACO (Tarragona) (Fig. 1, no. 3)

Due to the demolishing caused by the construction of the modern port, there is little evidence preserved of what was once one of the leading Hispanic ports.²² Fortunately, 19th century cartography shows the remains of a breakwater that allows us to intuit the remains of a presumably Roman dyke.²³ Studies carried out in the southern end of the current Tarragona have confirmed the existence of a first port of the Republican period in the eastern area fully resourced, with watering

¹⁶ CASANOVAS/ROVIRA 1994, 112.

¹⁷ JÁRREGA 2011, 81.

¹⁸ NÓVOA/ALEMANY 2005; RIBA/COLOMO 2009; JULIÁ/RIVERA 2012.

¹⁹ JÁRREGA 2013, 659-666.

²⁰ CONDE 2015, 71 ff.

²¹ RIBA/COLOMO 2009, 123-125; JÁRREGA 2011, 87.

²² POCIÑA/REMOLÁ 2001, 85.

²³ HERNÁNDEZ 1877.

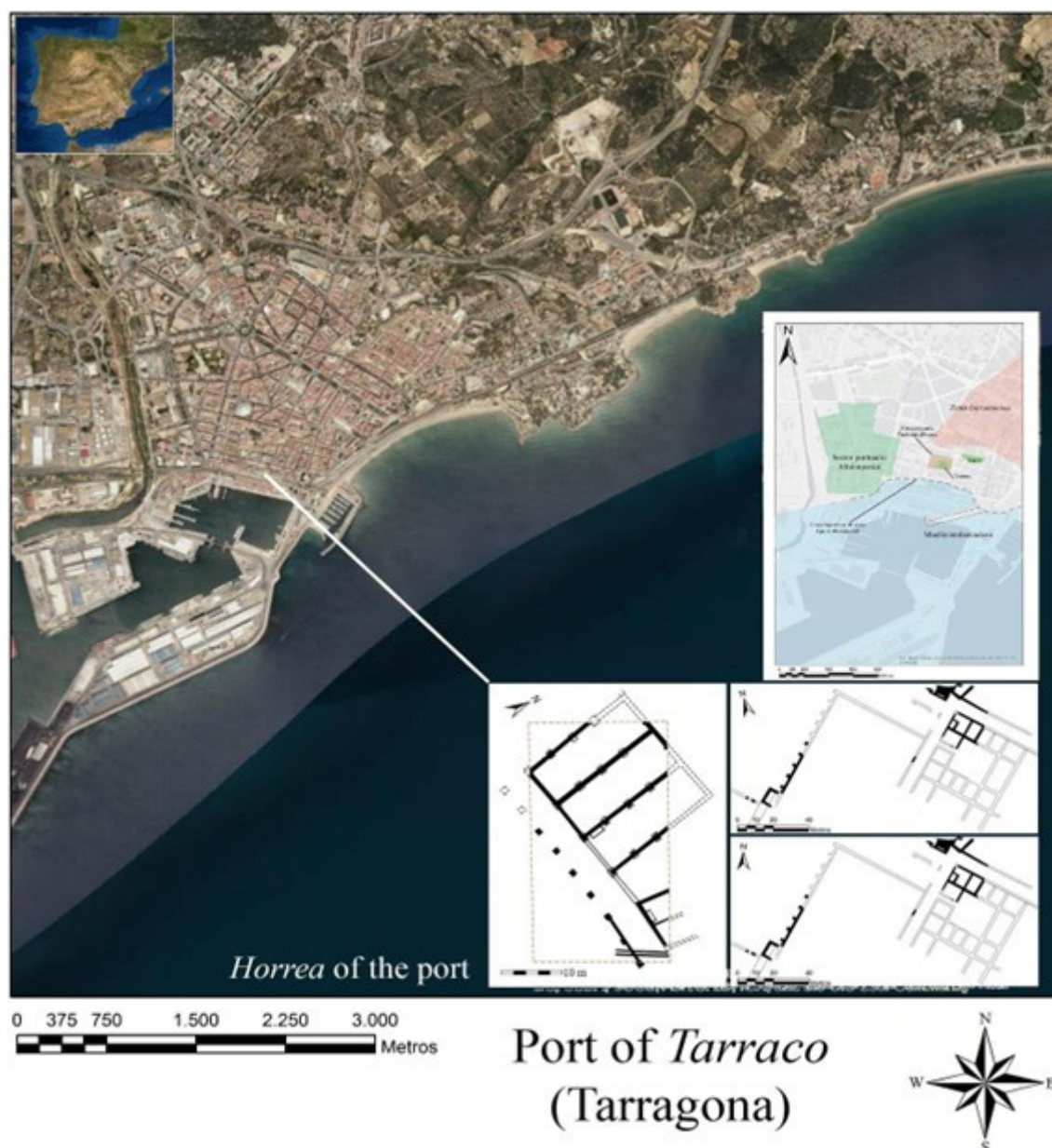


Fig. 4. Location of the *Tarraco* port and its structures (after MACÍAS/SOLÉ 2011, Figs. 6, 7 and 8).

points and infrastructures destined for loading and unloading activities next to *insulae* monopolized by warehouses and other port structures.²⁴ The urban reorganization of the Imperial period resulted in the formation of a port district or *emporium* in the western *suburbium*, composed of large *horrea* and a structural framework that emulated a metropolis.²⁵ Moreover, the ancient republican port will be transformed into a residential and leisure area with the construction of a thermal complex and a theatre, forming a public and monumental front behind which was the *forum coloniae*.²⁶

Regarding the *emporium* structures, the best known is a large complex of which about 600 m² have been excavated, although it is estimated to reach 6000 m². It has a two-

storey *horrea* or *porticus* type structure with multiple *cellae* configured around a central courtyard with a water tank and latrines. The preservation of big rings anchored to the structure indicates a crane system facilitating the good transport given its longitudinal arrangement about the oceanfront²⁷ (Fig. 4).

CAESARAUGUSTA (Zaragoza) (Fig. 1, no. 4)

The fluvial port of *Caesaraugusta*, located on the Ebro River as it passes through present-day Zaragoza, is hidden in the vicinity of the current Paseo Echegaray y Caballero next to the city's Roman bridge that gave access from the north to the great forum of the city.

In this area, between the bridge and the Huerva River mouth, several interventions carried out at the

²⁴ MAR *et alii* 2015a, 180-186.

²⁵ RICKMAN 1971; CASTAGNOLI 1993; MACÍAS *et alii* 2007; MACÍAS 2011, 193.

²⁶ MAR/ROCA/RUIZ 1993; DÍAZ/GARCÍA/MACÍAS 2000; MAR *et alii* 2015, 302.

²⁷ BEA 2008; MACÍAS 2011.

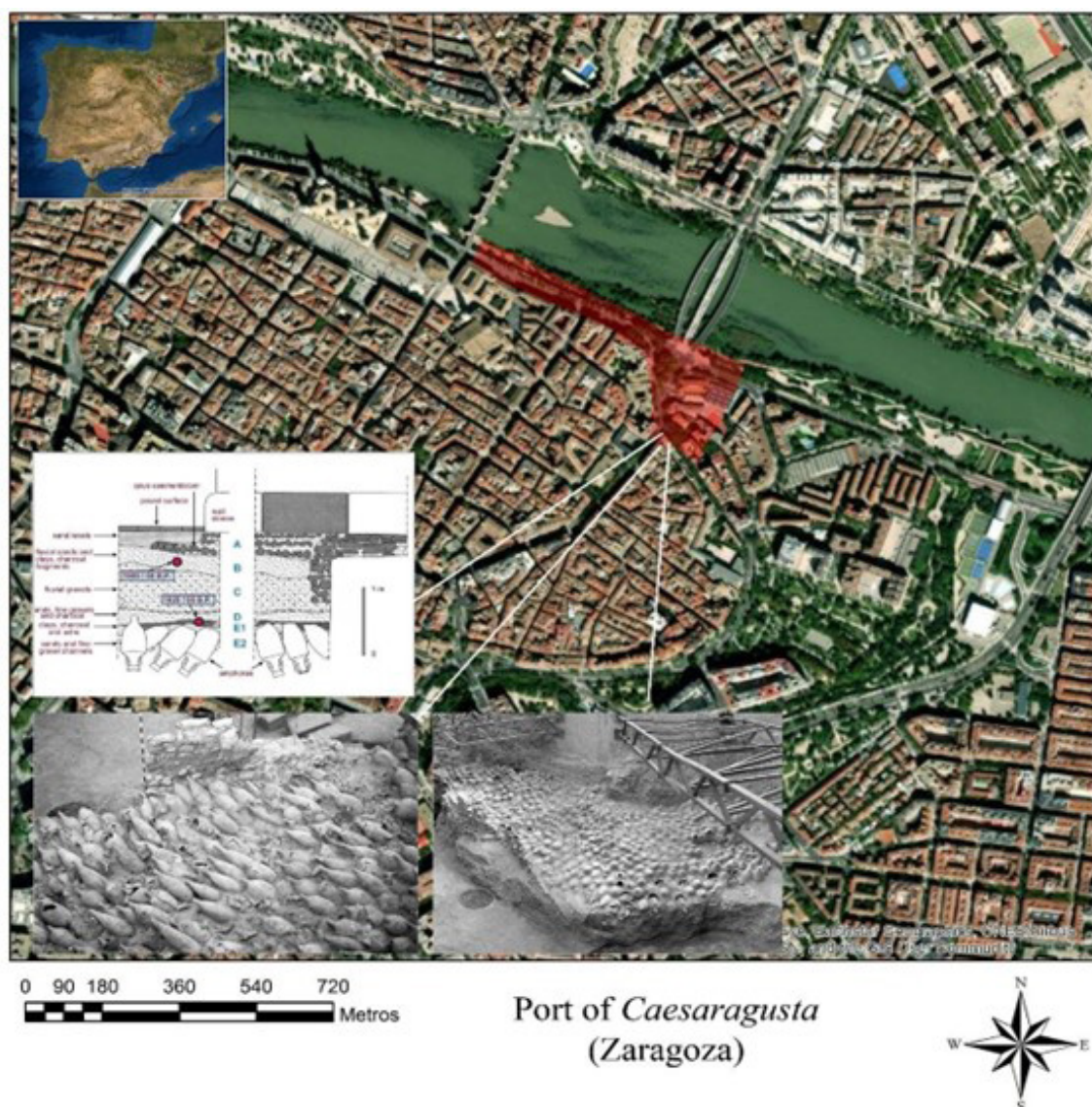


Fig. 5. Location of the levelling terraces in the *Caesaraugusta* port (after PEÑA *et alii* 2009, Fig. 6; CEBOLLA/DOMÍNGUEZ/RUIZ 2004, Figs. 1 and 3).

beginning and the end of the 20th century and some others at the beginning of the 21st century have corroborated the existence of a network of artificial terraces parallel to the riverbed, which had different port structures (Fig. 5).

Regarding these elements, today, there is not enough evidence to talk about the architectural organisation of the *Caesaraugusta* port. Nevertheless, the documentation of the different artificial terraces, as well as the ground levelling by using multiple *amphorae* elements in an inverted vertical position, allow us to understand the approximate extension that the port must have had from the current Plaza de las Tenerías to some place near the great forum. This artificial levelling has been documented in points very close to each other, particularly in the interventions carried out in the northeast sector of the city walls²⁸ and the current Plaza de las Tenerías,²⁹ where the term “field” of *amphorae* is needed, as

more than 800 amphorae have been documented positioned face down on the natural level of the Ebro River terrace. This system would work as a supporting and draining element for a large structure of which only part of an 80 cm thick *caementicium* preparation has been preserved, thus raising the terrace to a maximum height of 4 m above the riverbed.³⁰

The search for a flat ground by an artificial terrace in the city northeast sector, and the fact that all this work is coetaneous to the construction of the great forum, has allowed us to intuit in all this great work, the search for an improvement of the right side of the Ebro River between the mouth of the Huerva River and the Stone Bridge for the location of a simple port as a kind of elevated wooden docks connected to the great forum and the administrative buildings there.³¹

²⁸ DE LA FIGUERA 1934; ÍÑIGUEZ 1959; ESCUERO/DE SUS 2003; ESCUDERO/HERNÁNDEZ/NUÑEZ 2006.

²⁹ CEBOLLA/DOMÍNGUEZ/RUIZ 2004.

³⁰ CEBOLLA/DOMÍNGUEZ/RUIZ 2004, 467.

³¹ DE LA PEÑA *et alii* 2009.

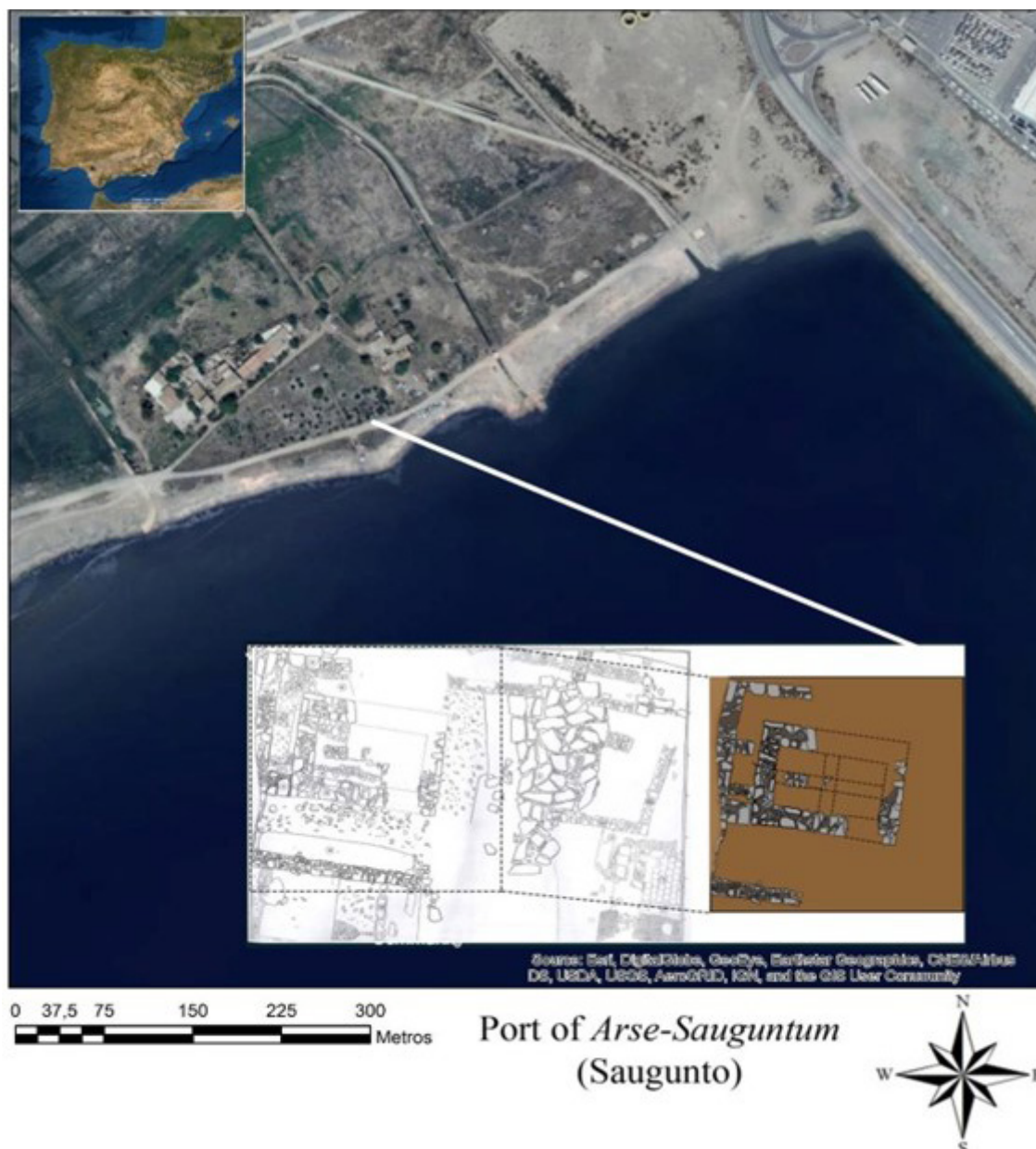


Fig. 6. Location of the *Arse-Sauguntum* port and the group of polyphase structures associated with the port tower-shaped structure (after ARANEGUI *et alii* 1985, 206. Fig. 3).

ARSE-SAUGUNTUM (Sagunto) (Fig. 1, no. 5)

Located 6 km southeast of the current city, the Roman port settlement has been the subject of successive studies both on land and underwater, defining a commercial settlement born between the fourth and third centuries B.C. and extending until the fourth and fifth centuries A.D.³²

Regarding the discoveries in the peninsular territory, 30 meters from the coastline, a possible tower-shaped structure made of spars has been located, linked to the defence of the Punic settlement —*turris anibalis*— although with consecutive restructurings that take us back to the Later Roman Empire³³ (Fig. 6)

Furthermore, a series of structures in *opus africanum* were found in a rectangular floor plan building —10.5 x 8 m— compartmentalized in successive longitudinal rooms that have been identified as a *horrea* based on the material record.

In the underwater area of Grau Vell and its surroundings, we can highlight the existence of a group of port structures identified as two breakwaters that would protect the inlet from waves and tides.³⁴ The first is composed of two courses of large sandstones with a length of 30 m, which allows them to be used as wharves even for ships of large tonnage —25/35 t—. The second, with similar features, appears aligned with the tower-shaped structure and reaches 130 m in length, with a lighthouse tower on its support.³⁵

³² ARANEGUI 1976; ARANEGUI 1977; ARANEGUI 1977; ARANEGUI 1982; BARRACHINA *et alii* 1984; ARANEGUI *et alii* 1985; ARANEGUI 2001-02;

³³ ARANEGUI *et alii* 1985, 205-223.

³⁴ GINER 2002.

³⁵ GINER 2002, 91-94.



Fig. 7. Location of the fluvial port of *Valentia* and the recreation of the structures it possessed (after RIBERA I LACOMBRA 2007, 37).

VALENTIA (Valencia) (Fig. 1, no. 6)

The Roman port, located in the city's northeast area, was created as a fluvial settlement connected to the Mediterranean through the Turia River. The first remains established as port structures are: on the one hand, the *horreum* situated next to the forum, the sanctuary of *Asklepios* and the thermal complex, with measurements that would occupy a complete *insula* and compartmentalized in four long identical naves in *opus quadratum* on a previous building;³⁶ and, on the other hand, some structures located in the surroundings of the fluvial brook.³⁷

In the Imperial period began the first phase of the fluvial port —end of the first century A.D. and beginning of second century A.D.—, preparing the banks of the Turia River by a terraced dock where hydraulic structures and paved areas were included.³⁸ Already in the middle of the second century, the expansion along the north bank took place, installing pools lined with *signinum* and a great

horreum with a courtyard —24 x 30 m— and its largest room possibly dedicated to the cult of Venus where the head of the goddess appeared in marble.³⁹ For its part, the Republican *horreum* will be amortized and a new multifunctional complex will be built in the current Plaza de Cisneros.⁴⁰ To this group is added the presence of a possible dock of stone blocks documented under Rocas street, which is used by the Islamic wall and barbican.⁴¹ Also, another possible wharf located under the current Tapineria Street, on which some structural remains related to aquatic activities were documented, has led to the possibility that it was a thermal bath⁴² (Fig. 7).

LUCENTUM (Alicante) (Fig. 1, no. 7)

Located in the bay of Albufera, approximately 400 m from the Roman urban centre, the port of *Lucentum* had a canal that connected the lagoon located to the southwest of

³⁶ RIBERA 1998, 450.

³⁷ BURRIEL/RIBERA/SERRANO 2003.

³⁸ RIBERA 2008, 35-36.

³⁹ RIBERA 2008, 37.

⁴⁰ BURRIEL/RIBERA/SERRANO 2003, 136-137.

⁴¹ BADÍA/PASCUAL 1990.

⁴² RIBERA 2008, 39.



Fig. 8. Location of the port of *Lucentum* in the Albufereta Bay with signs of the most significant features documented under its waters (after MIRALLES RODA 2001, Figs. 4 and 5; DE JUAN FUERTES 2011, Fig. 1).

the city by the sea, which was gradually filled until it reached its current state⁴³ (Fig. 8).

The evidence prior to the Roman settlement already points to the presence of a port district with a wharf on which there was a free-standing building formed by longitudinal rooms identified as a *horreum* with a chronology between the fifth and third centuries B.C.⁴⁴ The filling of the central canal and the move of the city to the east are some of the reasons that explain this temporary *hiatus*; thus, the structures from the early imperial period were found in the current Albufereta ravine, identifying a 48 m long jetty with mooring rings.⁴⁵

PORTUS ILICITANUS (SANTA POLA) (Fig. 1, no. 8)

To the complication that accompanies the urban archaeology, we can add the fact of unifying the urban settlement of *Ilici* with its access to the sea at La Picola — *Portus Ilicitanus*—. On this matter, the maritime settlement presents several superimposed phases that span from the Iberian period —450 and 330 B.C.— to the end of the fifth and sixth A.D., with a *hiatus* between the end of the fourth century B.C. and the founding period of *Ilici*.⁴⁶

The first phase of Roman occupation is associated with some very devastating structures that seem to define environments with a quadrangular tendency linked to habitation functions on which a new phase will be built in the II A.D. of greater size and with storage functions, coinciding with the moment of maximum apogee of the

⁴³ FERRER/BLÁZQUEZ 2012.

⁴⁴ ROSSER/ELAYI/PÉREZ/2003, 26-32.

⁴⁵ ORTEGA *et alii* 2004, 87-90.

⁴⁶ MOLINA/SÁNCHEZ 2005, 100.

Hispanic ports, being able to be raised as a control and access point to the fluvial canal that connects with the city. From the fourth century onwards, the construction of the salted fish production complex will be carried out, being the best-known period, occupying about 1,400 m².⁴⁷ Likewise, in *Ilici* there is evidence of a large building located under the current *Portus Ilicitanus* Avenue, interpreted as a large port *horreum*, which may indicate the location of the port area in the city.⁴⁸

CARTAGO NOVA (Cartagena) (Fig. 1, no. 9)

With an extensive research trajectory as basis⁴⁹ and the impulse provided by the development of underwater archaeology and the research of Cerezo Andreo⁵⁰ make the port of *Carthago Nova* one of the most studied and best known of the Western Roman Empire, a decisive settlement that connected the Atlantic-Mediterranean routes with the Balearic Islands and North Africa with a distinguished mention in classical literary sources.⁵¹

The port structures⁵² are arranged along the western limit of the city until they reach a bridge at its northern side that leads to the *porta ad stagnum et mare versa*, one of the main routes out of the city, behind which there was another front of smaller size that will form, at least until the Punic period, another inland cove. In this sense, from approximately the

second century B.C., a harbourfront began to be built, and it will be used until the fifth century A.D., using some of the previous Punic structures. The entire environment of the Cerro Molinete was subject to regularization and levelling works in addition to building a dock with sandstone stone blocks (Fig. 9)⁵³ behind which was built a porticoed front that served as reception and management of goods in various storage spaces,⁵⁴ with *lacus* or watering points.⁵⁵

These *horrea* assumed commercial functions and shared the space mainly of the northern front with industrial environments. Regarding the possible location of the lighthouse, the GIS analysis of the environment

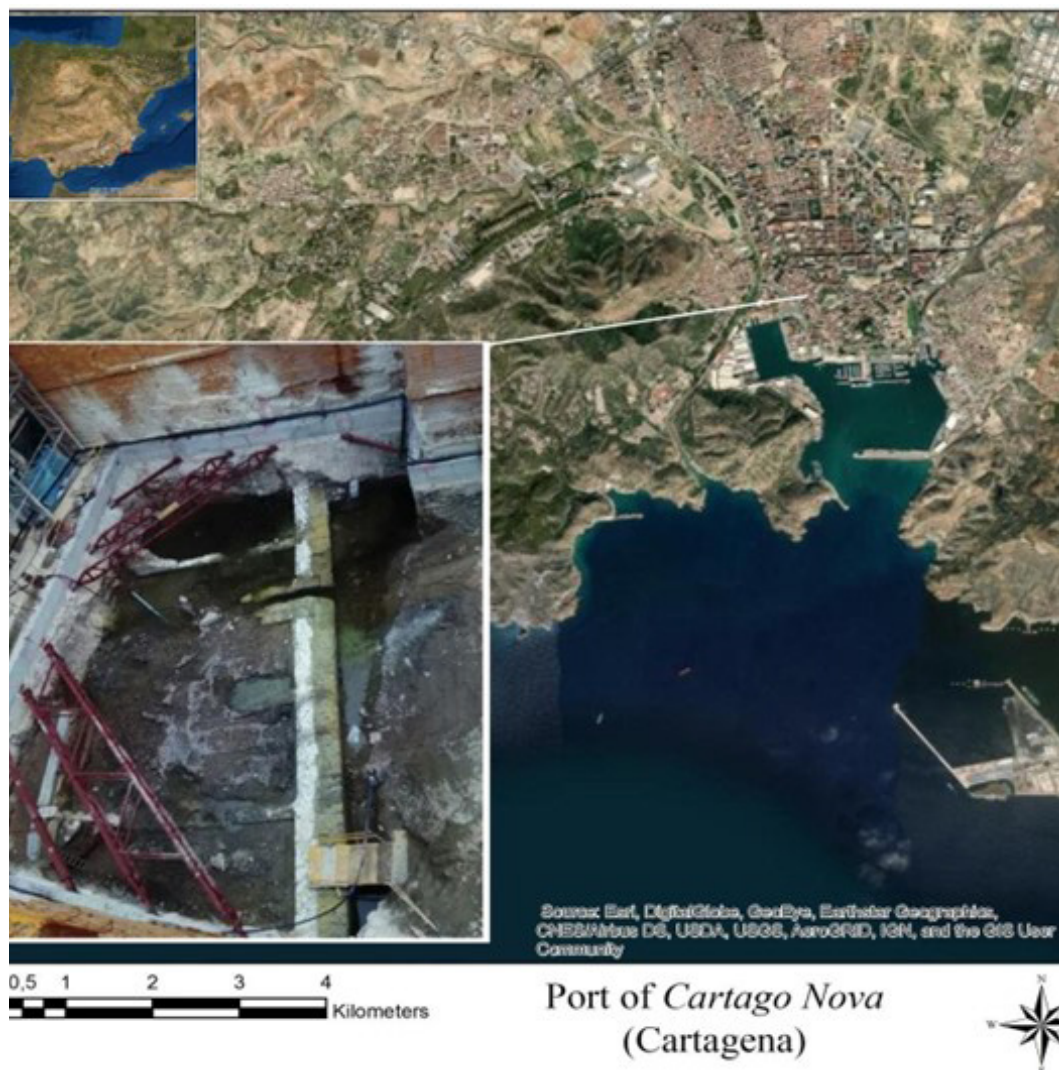


Fig. 9. Location of the *Cartago Nova* port. Structure of stone blocks that formed the main dock located under Mayor Street (after CEREZO ANDREO 2017, Fig. 4).

⁴⁷ MOLINA/SÁNCHEZ 2005, 99 ff.

⁴⁸ BLÁZQUEZ 2007, 5.

⁴⁹ MAS 1979; RAMALLO 1989; BERROCAL/MIQUEL 1991; ROLDAN/PÉREZ/MARTÍN 1991; RAMALLO *et alii* 1992; RAMALLO/ABASCAL 1997; BERROCAL 1998; BERROCAL 1999; BERROCAL 2008; MARTÍNEZ 2004; PINEDO/ALONSO 2004; RAMALLO/MURCIA 2010; RAMALLO 2010; RAMALLO/MARTÍNEZ 2010; RAMALLO/ROS 2012; RAMALLO/RUIZ 2013; RAMALLO *et alii* 2016.

⁵⁰ CEREZO 2015; CEREZO 2016; CEREZO 2017.

⁵¹ CONDE 2003; RAMALLO/RUIZ 2013.

⁵² CEREZO 2017.

seems to point to the island of Escombreras as the most propitious location, with the structure of La Laja being destined to functions of access control and defence of the

⁵³ ANTOLINO/SOLER 2001.

⁵⁴ RAMALLO/VIZCAÍNO 2011.

⁵⁵ RAMALLO/RUIZ 2010, 99.

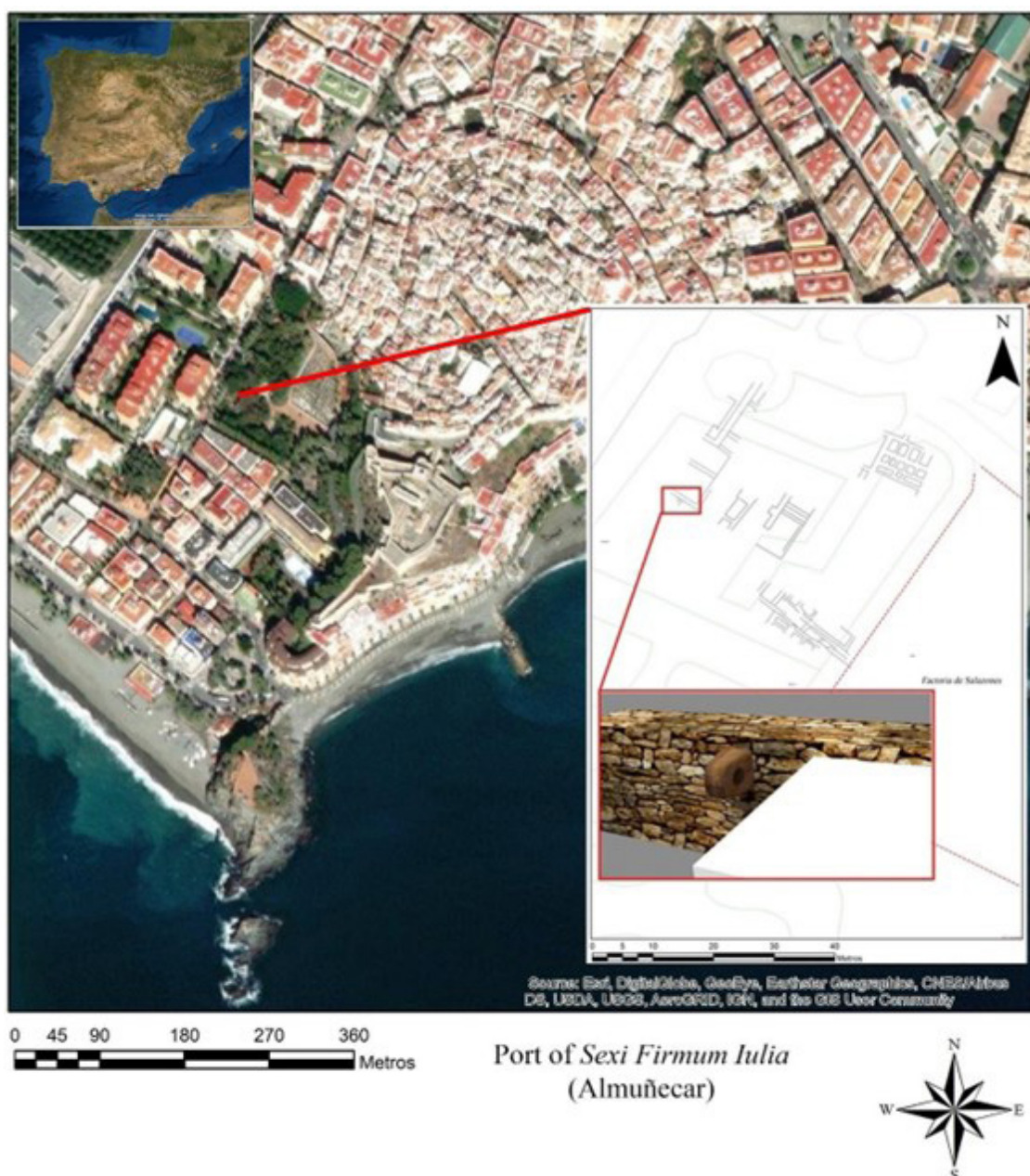


Fig. 10. Location of the *Sexi* port in the current Almuñecar. Reconstruction of the dock and *doctylum* documented in the port (after SÁNCHEZ LÓPEZ 2013).

port.⁵⁶ In respect of other places related to the port, of all the thermal complexes found, the one located in the central area of the western limit —between the porticoed front and the forum—, in the centre of the port area does not seem to leave any doubt about its condition, besides having recovered a marble plaque whose inscription highlights its public character *R[...]/ loco [dato]/ d(ecreto) d(ecuriorum) [d(ono) d(edit)]*, being also the largest in the city —1200 m²—. ⁵⁷

Finally, the analysis of the wreckages and the archaeological material, mainly ceramics, suggests a change in the commercial model between the Republican and Imperial periods, with a significant reduction in merchandise volume. The *annona* system displaced the coastal trade⁵⁸ and

negatively affected a port of redistributive character⁵⁹ as mark the fall in imports of consumer goods and the abandonment of warehouses and port structures;⁶⁰ to which must be added the possible insalubrious conditions caused by an inland lagoon that would require constant maintenance to reduce the impact of epidemics and diseases related to this type of ecosystem.⁶¹

SEXI (Almuñecar) (Fig. 1, no. 10)

Located on the current San Miguel hill, the ancient city of *Sexi* was flanked by two maritime coves contextualized

⁵⁶ CEREZO 2017, 450 and ff.

⁵⁷ NOGUERA/MADRID 2009, 256; MADRID/PAVÍA/NOGUERA 2015.

⁵⁸ WILSON 2011, 34.

⁵⁹ RAMALLO 2011.

⁶⁰ CEREZO 2015, 29.

⁶¹ EGEA 2012, 220-222.

at the mouths of the Verde and Seco rivers.⁶² Its privileged position was already noticed in Phoenician times, also assuming its evolution to *municipium* in the second half of the first century B.C., at which time it seems to begin an urban renewal that will extend until the second century A.D.⁶³

Regarding the port structures, they have been found on all the urban fringes. The best known is El Majuelo, on the western limit, where an extensive salting factory was found, which apparently had its own area for loading and unloading⁶⁴ and its branch of the aqueduct.⁶⁵ On the eastern end, a possible *caementum* breakwater and stone blocks that formed the port of the city were found,⁶⁶ establishing an urban specialization with a cove dedicated to industrial and productive functions, and another one specifically for port functions (Fig. 10).

CORDUBA PORT (Cordoba) (Fig. 1, no. 11)

To date, the fluvial port of *Corduba* has considerable limitations regarding structural remains. On this matter, the various studies on the navigability of the *Baetis* from *Hispalis* through a river circuit modified by dikes and locks that allowed altering the flow in certain areas have become decisive in understanding the classical mentions on the various types of boats and recovery systems that marked the edges of the Guadalquivir. This system that allowed the navigability of a whimsical and torrential river is the starting point from which to show the fluvial port system of Roman Cordoba, which was primarily determined by the dangerous swellings of the river. On this point, the port of Cordoba has been subjected to a profound historiographical and archaeological inspection,⁶⁷ which has exposed its possible location and configuration considering the archaeological remains documented in the gate that provides access to the city from the Via Augusta bridge. Various structural elements such as a stairway that descends to an area adjacent to the river connected to a possible dock or quay⁶⁸ allow us to interpret a direct connection between the port, the city gate and the sizeable arcaded square next to *tabernae*.⁶⁹ Likewise, this area located in the bank has been interpreted as an area strongly influenced by port activities based on the remains of commercial and manufacturing buildings located on both sides of the bridge (*officinae, horrea, fliginae, etc.*).⁷⁰

BAELO (Bologna) (Fig. 1, no. 13)

In the case of *Baelo Claudia*, as in other large urban ports, we have extensive knowledge of the city but not so much of its port infrastructures. On this subject, although the data provided by the latest research represents significant progress in this line, this progress is subject to multiple clarifications that stay open to new archaeological

interventions.⁷¹ According to the conclusions reached, the port area of *Baelo Claudia* was located inside an inlet or coastal lagoon, isolated or semi-isolated from the sea by a sand barrier,⁷² of which very possibly there is no evidence left today due to the effects caused by a tsunami in the third century A.D.⁷³

The port *suburbium* configured inside this bay seems to have had several infrastructures, the first corresponds to a ramp raised directly on the sandy level of the beach, located in the southern sector of the city wall and next to which a series of structures made of limestone spare was found.⁷⁴ Regarding this infrastructure, there were at least two possible breakwaters and a series of structures interpreted as possible marshlands built with wood⁷⁵ aligned with the *cardines* of the city. They indicated a typical port system of shallow water that required this type of solution for loading and unloading of goods.⁷⁶

On this matter, the presence of a terraced platform of 675 m² elaborated with *opus incertum* walls filled with sand and clays in alternating layers was also identified, a remarkable engineering work that affected the maritime territory as early as the mid of the second or the first century B.C. and amortized two centuries later.⁷⁷ The alternate position and arrangement of the walls that make up the structure has been interpreted as a storage and docking area, especially due to the discovery of a *doctylum* or mooring element in its surroundings.⁷⁸ Regarding the lighthouse as a distinguished port element, the different proposals point to the possible existence of a *thymoskopeion* lighthouse that would probably be located at Cape Camarinal⁷⁹ (Fig. 11).

GADES (Cadiz) (Fig. 1, no. 14)

Although the *Portus Gaditanus* is in the current Puerto de Santa María,⁸⁰ the Bay of Cadiz is considered a single organization in which *Gades* was the gateway and main centre of administration.⁸¹ The port of *Gades* is located in the confluences between the Plaza de Abastos, the Mercado Central and Sagastastreet, although there are only partial data and is difficult to contextualize. The results of the interventions carried out⁸² allow us to reconstruct the system of structures that marked an ancient canal, now disappeared, that connected the Atlantic with the inner Bay. This evidence, added to the results obtained in the latest research from the geomorphological point of view,⁸³ allow us to envisage an archaeological reality that helps to understand better the dynamics of a key port at the mouth of the Guadalquivir and the Strait of Gibraltar.

⁶² ARTEAGA/HOFFMAN 1987, 120.

⁶³ BURGOS/PUERTA/PÉREZ 2004, 434; SÁNCHEZ 2013, 140-143.

⁶⁴ SOTOMAYOR 1971; SÁNCHEZ, 2013.

⁶⁵ SÁNCHEZ et alii 2010; SÁNCHEZ/MORENO 2012.

⁶⁶ FONTANA 1946, 374; DEL MORAL 1981, 25; RUIZ 1991, 750-751.

⁶⁷ VAQUERIZO 2021.

⁶⁸ LEÓN 2007, 58.

⁶⁹ VAQUERIZO 2021, 492.

⁷⁰ MORENA 1997; VARGAS/CARRILLO 2004; GARCÍA 2005.

⁷¹ ALONSO et alii 2007, 526.

⁷² ALONSO et alii 2007, 530; ALONSO/GARCÍA 2003, 195-196.

⁷³ ALONSO et alii 2007, 526.

⁷⁴ EXPÓSITO 2014; BERNAL et alii 2017, 325-326.

⁷⁵ ALONSO et alii 2007, 533-ss.

⁷⁶ BERNAL et alii 2017, 328.

⁷⁷ ALONSO et alii 2007, 534; BERNAL et alii 2017, 333-ss.

⁷⁸ BERNAL et alii 2007, 216-ss; BERNAL et alii 2017, 330, 333.

⁷⁹ BERNAL et alii 2017, 336.

⁸⁰ CHIC 1983; CHIC 2004; BERNAL 2008; LÓPEZ/PÉREZ 2013; LARA 2019.

⁸¹ BERNAL 2008, 225; BERNAL 2020; LARA 2020.

⁸² ARTEAGA et alii 2001; GARCÍA 2008.

⁸³ BERNAL et alii 2020; 2021.

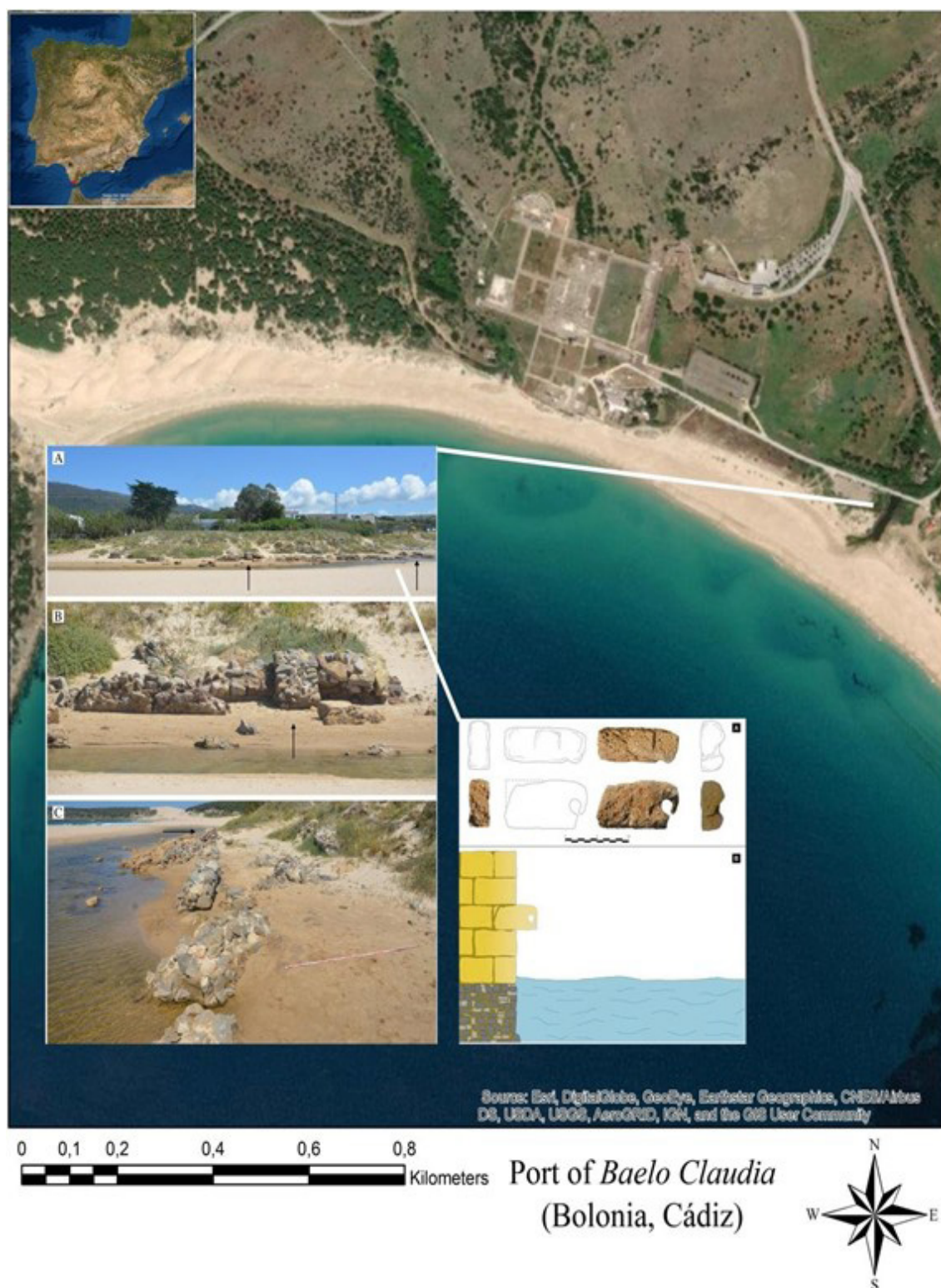


Fig. 11. Bologna beach with signs of the port structures for contacts documented at the *Baelo Claudia* site (after BERNAL *et alii* 2017, Figs. 10 and 12).

Several superimposed constructions are noticed regarding the structures documented between the Plaza de Abastos and the Mercado Central. Unfortunately, those associated with the Roman period seem to be in a clearly secondary position and may have been part of a containment structure of the canal built in ashlar masonry that would

also have a porticoed area.⁸⁴ These structures seem to be related to the wall sections found in Sagasta street identified as a dike supported on *arquationes* with a monumentalized platform on the upper part due to the recovery *in situ* of an Attic marble pedestal⁸⁵ (Fig. 12).

⁸⁴ BELIZÓN 2008; BERNAL 2012, 230-231.

⁸⁵ GARCÍA *et alii* 2008.

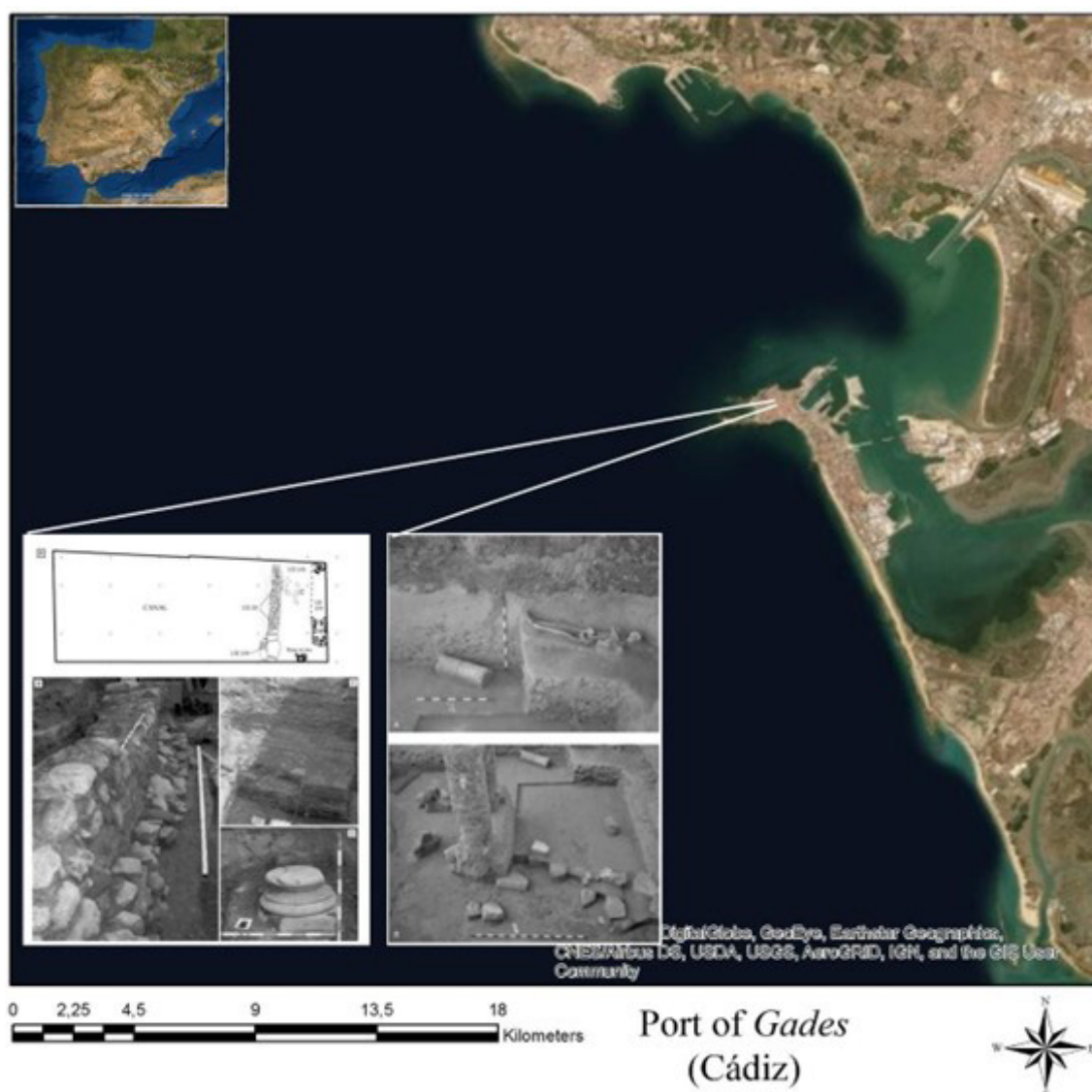


Fig. 12. Location of the *Gades* port. Structures documented between the Plaza de Abastos, the Mercado Central and Sagasta street 96-8 (Cadiz) (after BERNAL CASASOLA 2012, Figs. 11.4 and 11.5).

HISPALIS (Seville) (Fig. 1, no. 15)

Urbanism has been widely studied by historiography⁸⁶ describing an environment in constant evolution and conditioned by its riverbed that, despite the lack of some data, the existing information highlights the leading role it played as *annona* port.⁸⁷ In this port settlement, two functionally differentiated areas can be distinguished; on the one hand, the entire western limit of the city, which was systematically exploited by the fishing/canning industry, with numerous port infrastructures oriented to this activity—wharves, warehouses, hydraulic infrastructures, etc.—and which occupied the territory between the Roman

population centre and the Guadalquivir banks, needing to expand the walled perimeter.⁸⁸

On the other hand, with the economic progress of the city and its positioning as an output port for the hinterland of Hispania Baetica, its southern side where the Guadalquivir and Tagarete converged was selected the main port area of the city. The area was monumentalized, having several *sacella* dedicated to divinities, among which an *Iseum* stands out. Furthermore, a *statio olearium* was installed as evidence of its commercial and strategic weight that remained active throughout the second century A.D.⁸⁹ (Fig. 13).

On this subject, the literary sources discuss the exponential growth of this port settlement between the end of the first century B.C. and the first decades of the following century, emphasizing a magnitude that competed with the selfsame port of *Gades* (*Bell. Civ.* 2, 18, 1). At the end of

⁸⁶ COLLANTES 1977; BLANCO 1979; CAMPOS 1986; CAMPOS 1990; BLANCO 1992; CAMPOS 1993; GONZÁLEZ 1993; GONZÁLEZ 2010; GONZÁLEZ 2011; GONZÁLEZ 2012; CABRERA 2014; GARCÍA/ORDÓÑEZ/CABRERA 2017.

⁸⁷ GARCÍA 2007; GARCÍA 2012; ORDÓÑEZ/GONZÁLEZ 2011; BERMEJO/MARFIL/CAMPOS 2018.

⁸⁸ CHIC 1990; CHIC 1998; GARCÍA 2003; GARCÍA/ORDÓÑEZ/CABRERA 2017.

⁸⁹ GONZÁLEZ 2010, 92-103; GONZÁLEZ 2012, 867-872; GARCÍA/ORDÓÑEZ/CABRERA 2017.

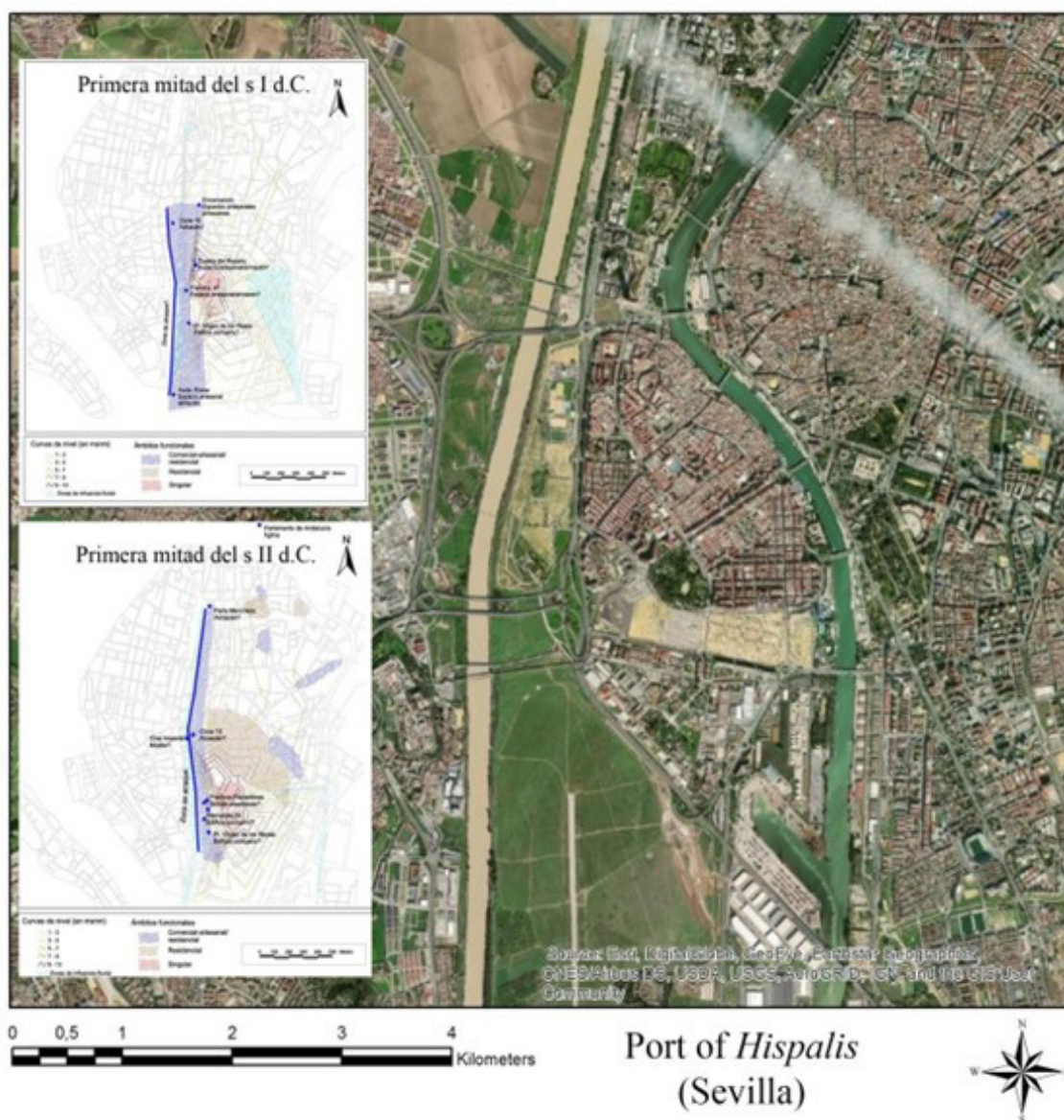


Fig. 13. Location of the *Hispalis* fluvial port in the ancient course of the Guadalquivir as it passes through Seville (after GONZÁLEZ 2008, Fig. 13; 2011a, Fig. VIII.18 and Fig. 14; GONZÁLEZ 2011, fig. VIII.20).

the Flavian or early Antonine period, a considerable urban restructuring took place; the salting basins of the current Encarnación were filled, and part of the productive activity was transferred to the left bank of the Guadalquivir with activities of remodelling and improvement of the riverbank.⁹⁰

ONoba (Huelva) (Fig. 1, no. 16)

The *Onoba Aestuarina* port is located in the area of the historic district of the current city. Recent research⁹¹ has made it possible to reinterpret the structural framework provided by the archaeological site exposing the existence of a port complex divided into two clearly differentiated sectors.⁹² The

first of these sectors, destined for the production of salted fish and storage of the port, as indicated by the presence of a factory and *horrea*, in addition to having a thermal space located in the north of these facilities. In the same way, to the southwest of these areas, very close to the ancient tidal line, is documented a structure indicated as a lighthouse or signal marking the entrance to the harbour.⁹³

Next to this production area, but on the west side of the cove, we can find the fiscal/administrative sector of the port thanks to the interpretation of a large building, elaborated in ashlar, as the *statio*. This was the place where the storage and control by the port *procuratores* of all activities related to the fiscal activity or *portorium* took place⁹⁴ (Fig. 14). Next to this zone, another group of structures possibly related to storage would support the main building. The dates provided

⁹⁰ GONZÁLEZ 2010, 87-92.

⁹¹ CAMPOS 2011; CAMPOS/BERMEJO/RODRÍGUEZ-VIDAL 2015; DELGADO 2016; CAMPOS/BERMEJO 2017a; CAMPOS/BERMEJO 2017b; BERMEJO/CAMPOS/RODRÍGUEZ-VIDAL 2017; BERMEJO/CAMPOS 2020.

⁹² CAMPOS/BERMEJO 2017a, 755-758.

⁹³ BERMEJO/CAMPOS 2017a, 758-760; 2020.

⁹⁴ BERMEJO/CAMPOS/RODRÍGUEZ-VIDAL 2017, 228; CAMPOS/BERMEJO 2017a, 757.

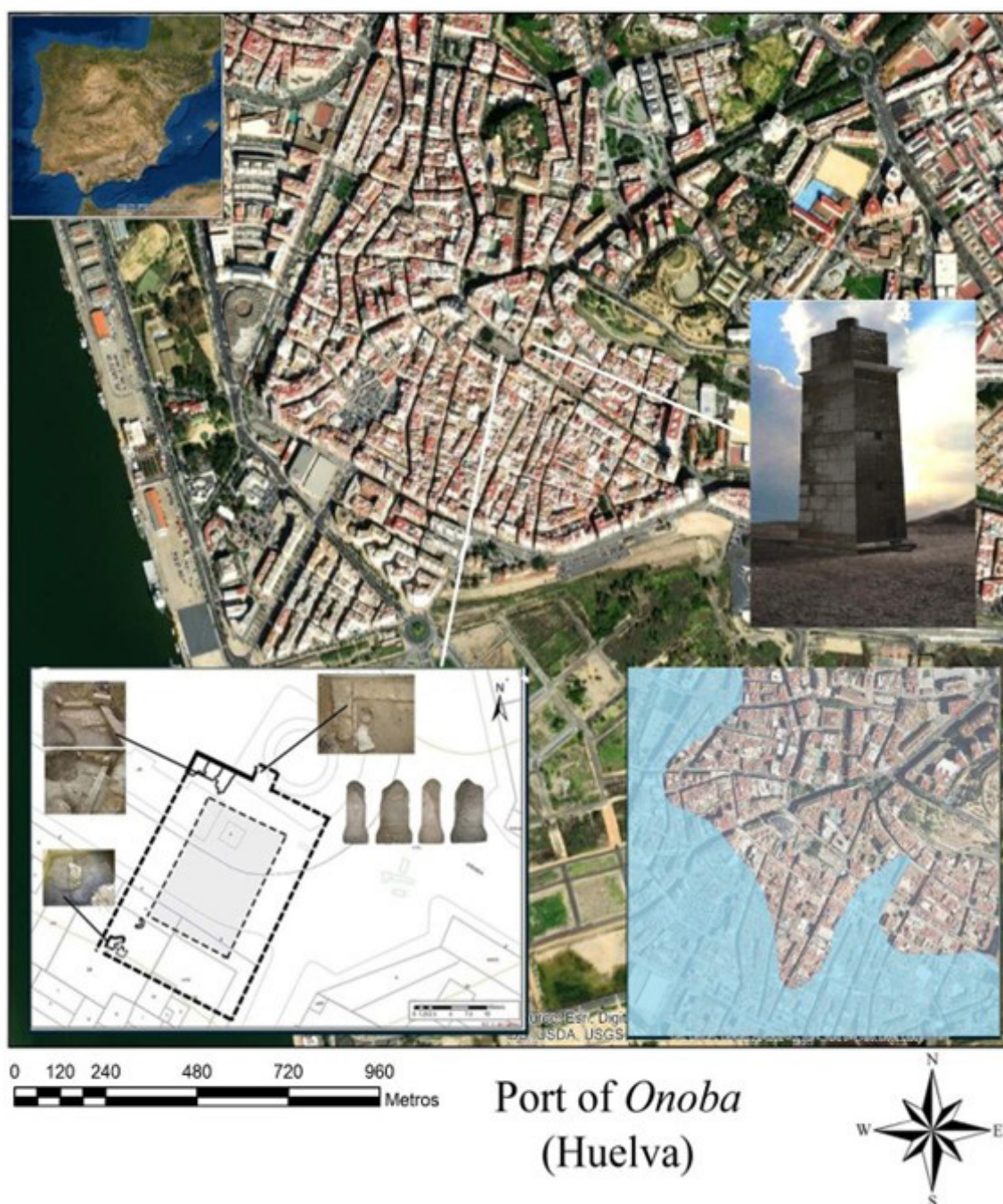


Fig. 14. Location of the *Onoba* port and recreation of the ancient riverbed of the Odiel as it passes through Huelva. Location of the *Onoba* port *statio* (after CAMPOS/BERMEJO/RODRÍGUEZ-VIDAL 2017).

by the research delimit a chronological range spanning the first and second centuries A.D., from which time this area of control and audit seems to fall into disuse, and the centre of activity will focus on the fishing conservation settlements of the *territorium* partly due to the decadence of the mining industry.⁹⁵

PORT OF MYRTILIS (MÉRTOLA) (Fig. 1, no. 18)

The port of Mértola was the last navigable point of the large waterway that was the Guadiana River, which

connected this enclave from its mouth in the Atlantic, with the main Mediterranean trade routes. This navigability, favoured by the tidal influence of this fluvial artery, can be contrasted until the 16th century in the engravings of Duarte de Armas, in which boats of up to three masts can be appreciated.⁹⁶

It is these engravings where the so-called “Porta da Ribeira” can be seen, constituted by an angled door topped by a turret whose destruction occurred in the early 20th century with the remodelling and construction of the current dock.⁹⁷ At this place, the urban interventions of the early 20th

⁹⁵ CAMPOS/VIDAL/GÓMEZ 2004; CAMPOS 2007, 423-524; CAMPOS/VIDAL/GÓMEZ 2008, 273.

⁹⁶ LOPES 2017, 553.

⁹⁷ BOIÇA 1993, 59.

century that provided the reorganization of the port and the riverbed went to show a section of this tower from Roman times. Thanks to the recovered materials, the port spanned a broad chronological period, specifically between the fourth century B.C. and the fourth century A.D.⁹⁸

OLISSIPO (Lisbon) (Fig. 1, no. 19)

The archaeological panorama of Lisbon is highly conditioned by the earthquake/tidal wave of 1755 and the knocking down of previous structures due to the reuse of materials or the burying of structures under the new urban framework, and the structures of one of the main ports of entry and exit of goods to the Atlantic routes are unknown.⁹⁹ Research on the *Olissipo* coastline has revealed the presence of an estuary that was introduced into the interior of the urban centre about 200 m approximately,¹⁰⁰ and around which the structures that formed the fluvial port would be articulated.¹⁰¹

In the first place, there is an imposing buried structure under the current Rua da Prata that had a system of 80 m long and 16 m wide galleries, which pass parallel to the ancient bed of the estuary. Although it was first interpreted as hydraulic conduction,¹⁰² it seems that it was a cryptoporticus over which a possible forum of the corporations would be developed.¹⁰³ Secondly, under the Rua do Oro, a polyphase structure was found with a wall of *incertum* that delimits two clearly differentiated areas, one of them being stuccoed and with an altar inside.¹⁰⁴ With a ceramic repertoire dated between the first century A.D. and the

end of the fourth century, and the presence of abundant *amphorae* material, it could be a *statio* similar to *Onoba* (Fig. 15).

BRIGANTIUM (A Coruña) (Fig. 1, no. 20)

Of the structures that articulated the port of *Brigantium*, only its imposing lighthouse remains, although there is evidence from medieval sources of the existence of a structure composed of up to 24 arcades that get into the bay.¹⁰⁵ In this area, some authors locate other structures based on testimonies of divers who note the presence of structures

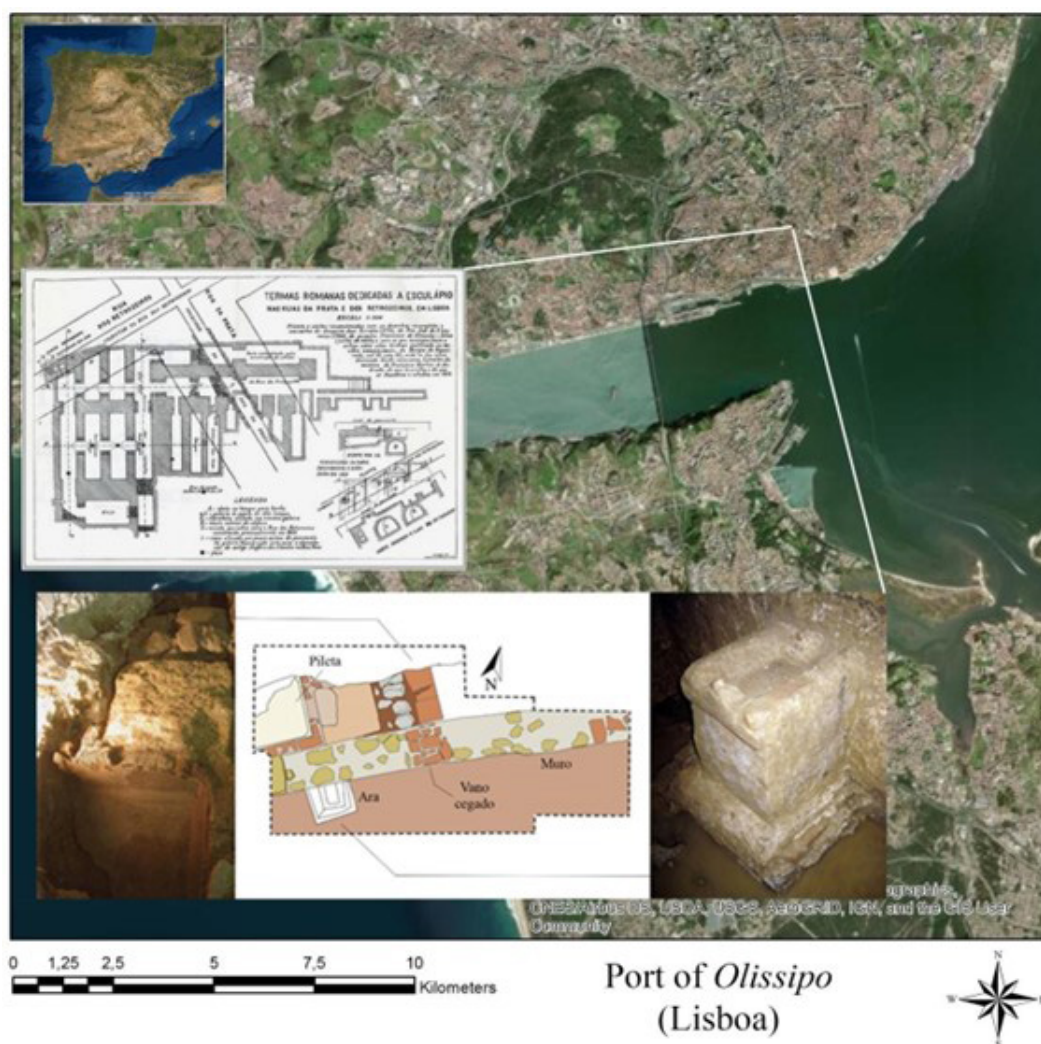


Fig. 15. Location of the *Olissipo* port and its main structures identified as a port cryptoporticus and a *statio* (after BAUNHA DA SILVA/VALONGO 2016, photos 1 and 2, Figs. 3 and 4).

composed of large granite blocks arranged diagonally from an area near the Puerta del Clavo in the direction of the current Finisterre Hotel.¹⁰⁶ This news is combined with the underwater finds of ceramic material and a Roman anchor stock, indicating the development of maritime activities in that zone.¹⁰⁷

⁹⁸ LOPES 2017, 354.

⁹⁹ FABIAO 1992.

¹⁰⁰ DURAO 2011.

¹⁰¹ AMARO 1993; RIBEIRO 1994a; DA SILVA 2009; FABIAO 2020.

¹⁰² DA SILVA 1997.

¹⁰³ RIBEIRO 1994b, 1997.

¹⁰⁴ BAUNHA/VALONGO 2016, 122-126.

¹⁰⁵ BALIL1980; BLÁZQUEZ 2007, 39-40.

¹⁰⁶ LÓPEZ 1980.

¹⁰⁷ GARRIDO/VALDÉS 1991.

Similarly, on solid ground under the current square of General Cánovas de la Cruz, very close to Parrote, a possible factory dedicated to the transformation of fish products such as murex was documented, contextualizing the area as an industrial zone at least since the end of the first century B.C.¹⁰⁸ Finally, studies of epigraphic elements seem to point to the existence of a *statio* dedicated to collecting taxes or *portorium* of the merchandise that arrived at the port in the area of the current Santiago Church.¹⁰⁹

OIASSO (Irun) (Fig. 1, no. 21)

The archaeological discoveries of the *Oiasso* port meant the identification of almost all the structures that made up a Roman port with two quays or berth areas, a dry dock in the form of a fossil beach, a series of port *horrea* and a thermal bath located in its area of influence; all of this preserved thanks to the context of marshes surrounding the current city of Irun.

These structures are distributed in three functional zones arranged in two occupation levels. In the northern sector, a wharf-dry dock was documented; in the southern sector, a storage area —*horrea*— and in the central zone, a fossil beach area full of reed beds.¹¹⁰

The structure of the wharf was made with wood covering the first 15 metres of the northern sector, built with pilings and with a stuffing based on organic sediments, ceramics, and a stone pouring that runs parallel to the woody structure with an outercourse arranged in an organized manner and the interior in the form of a fluid. The dry dock was located in the northern area of the wharf, and it was forming a line of 11 metres formed by very fine sediments; grey silts, barren in terms of archaeological material except for

a small space in which a wooden quay of small dimensions is noticed, that has provided numerous material remains that would span from the first half of the first century A.D. to the second century A.D.¹¹¹ Regarding the *horrea*, the area where they are located is separated from the reed bed or dry dock by a wooden sheet pile retaining wall. The analysis of the construction allowed the identification of two structural levels, and it was the second one that had an orientation in line with the surrounding structures.¹¹²

Likewise, in the current Tadeo Murgia street, a loading bay was found organized in 4 steps and remains of what seem to be *horrea*.¹¹³ This dock has an average width of 2 m and a maximum development of 18 m, and it is laid

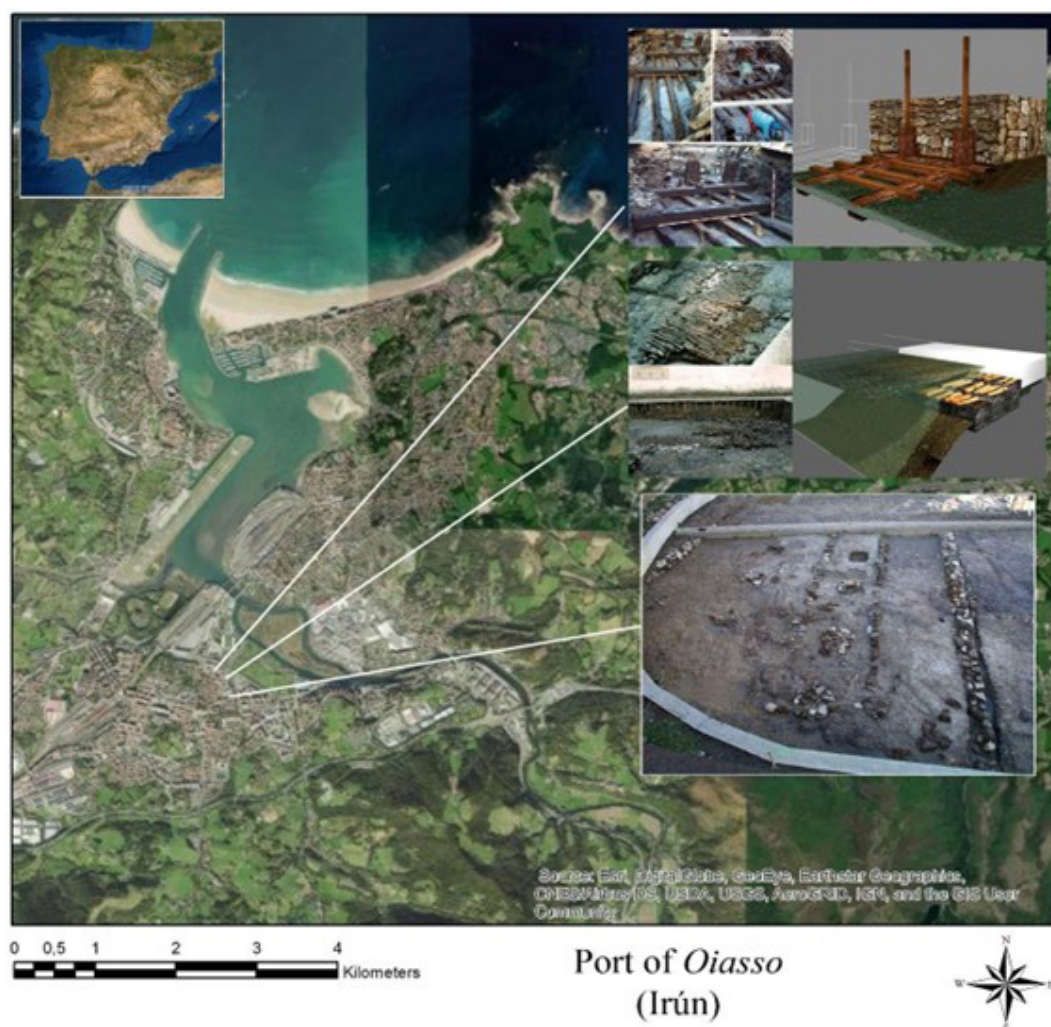


Fig. 16. Location of the *Oiasso* port and the main documented structures (dry dock/wharf/warehouses) (after URTEAGA 2008, 29, 30, 31, 36 and Arkeolan Foundation).

out of the flooded ground by means of stone plinths and wooden grounding points on them, reaching a difference between the highest and lowest steps of 1-1'20 m. For its part, the storage building was separated from the waterline

¹⁰⁸ BELLO/VLÁZQUEZ 1994.

¹⁰⁹ BELLO 1991; NAVIERO 1991.

¹¹⁰ URTEAGA 2008, 33.

¹¹¹ URTEAGA *et alii* 1997, 473; AMONDAGAIN 2018, 34.

¹¹² URTEAGA 2006; AMONDAGAIN 2018, 35.

¹¹³ GEREÑU *et alii* 1997; URTEAGA 2003; URTEAGA/GEREÑU 2003, 437; URTEAGA 2006.

by retaining walls and some 14 m wide and 18 m long of its structures and foundations were preserved, composing a floor plan divided into 4 m wide boats¹¹⁴ (Fig. 16).

The last building associated with the port area is the so-called Termas de Beraketa,¹¹⁵ a polyphase building whose presence highlights the importance of this port considered as a top-rated port in the hinterland of the Bidasoa estuary, which works as a gateway to the Cantabrian Sea and the routes that connected with the western limit of the continent.

FINAL CONSIDERATIONS

As shown in the preceding pages, there are numerous archaeological testimonies related to the port areas that, along the coasts of the Hispanic provinces, marked the geography of the Iberian Peninsula. The coincidental discoveries, research projects and digs in urban areas motivated by the contemporary urban and port development allow us to perceive a diverse, rich, and complex outlook of the port topography in the Hispanic cities. In the overview developed, it has been highlighted important information related to port layout, configuration, infrastructure arrangement, and architectural models, among others, that reveal a series of common premises in the adoption of formulas more or less used in other Mediterranean port districts. Furthermore, there is an evident need for interdisciplinary studies, where coastal geomorphological analysis provides data for interpreting and understanding ports.

One of the first ideas that are gathered from this is the configuration of authentic port *suburbia*, outlying urban areas that bind together all the services typical of maritime cities, a logical aspect if we consider the particularity of what a port represents —as an own entity— in the development of a city: productive, industrial, and artisanal environments, warehouses, necropolis, etc. This topographical arrangement seems to be corroborated —at least more clearly— in cities such as *Barcino*, outside the city walls, in *Tarraco* itself, *Baelo* or in the city of *Onoba*. In all of them, it has been possible to identify, more or less clear, port infrastructures and functions united in a neighbourhood or focalised area, giving it its own essence. In these cases, moreover, these *suburbia* have a considerable size in the general context of the city, from which we can deduce a leading role, a distinguished position that suggests that the city was dependent on its port. Regarding this organisation, in addition, these port settlements show certain proximity to the main monumental public areas, such as the *fora* themselves, which emphasises the role of the local elites with the economic activities dependent on the port, maritime commercial transactions, shipping companies, corporations, etc. That is, the political and economic power of the city will be reflected in the monumental character and prominence of its port. These aspects are present in several examples of well-known port cities, such as *Valentia*, *Carthage* in the Mediterranean or the city of *Olissipo* on the Atlantic watershed, cities whose monumental public complexes are topographically closely

linked to the port area. Associated with this premise, in some cities public administration and service buildings stand out, where key products were probably overseen in those ports and the *portorium* was collected. This type of buildings has similar features, ashlar factories, large storage spaces, as well as worship areas, usually small *sacella*. This type of buildings, identified as *stationes*, has been found in *Hispalis*, *Onoba* and *Olissipo*. The dissemination of these models should be found in the maritime connections with top-rated Mediterranean ports, where the same type of buildings is found, but on a larger scale.

About the previous idea, although with less archaeological evidence to support it, there are documented cities whose ports have *thermae* in their topographic configuration. There are many testimonies throughout the Atlantic and Mediterranean port geography showing the implantation of these thermal complexes in the port or port district itself, which leads to considering this type of enclosures as another element of the topographic configuration of those. Obviously, the inclusion in the port area of such buildings leads to consider a preferential use by the population that works and lives in the port, as well as navigators or people in transit arriving at their layovers. Some thermal complexes that have been found are testimonies of this configuration where this type of buildings can be found in port areas, for example, in cities such as *Valentia*, *Baelo*, *Onoba*, *Oiasso*... As a Mediterranean example, in a large port, we could bring up the so-called *thermae della lanterna* in *Portus*, located at the start of the east-west dock.¹¹⁶

In the topography of the Hispanic ports, there are documented some buildings linked to the storage function, *horrea* that, in some cases, are arranged in a broad front along the port line. Remains of this type of environment are documented thanks to structures such as the large building of two units separated by an *angiporticus* next to the monumental area of Tarraco —Sant Miquel Street and Castaños Street—, the *opus africanus* work of the *Arse-Saguntum* port, the *horreum* of the southern area of the *Carthago Nova* port where the *forum* road and the road to *Baetica* converged, the construction with large sandstone ashlar with an inner courtyard and two levels connected by a marble staircase next to the *statio* of *Hispalis*, the supposed *horreum* of *Carteia* with 14 m long and 50 cm wide walls on a large platform of *signinum*, the *Baelo Claudia* model on a large terraced structure of 675 m² with *opus incertum* walls next to a quay with *doctylum*, the *horreum* of *Oiasso* as a collector and redistributor to the North Atlantic routes from the late Republican period, or the *horreum* of *Caesaraugusta* itself. To these examples, we could add the ones found in settlements such as *Onoba*, *Valentia* or *Lucentum*, among others.

In the port landscape of the Hispanic cities, other buildings that are part of the design of these environments come from the maritime signalling elements, *phari*, *lanternae* or *turris* situated in key points of access to ports or inner harbours. Examples of this type of structure have been identified with more or less precision both by direct testimonies (archaeological remains) and indirect (literary

¹¹⁴ URTEAGA 2009; URTEAGA/ALKAIN 2009, 8; URTEAGA/ARCE 2011, 216.

¹¹⁵ GERENU *et alii* 1997, 475-476; GERENU 2002, 491; URTEAGA 2006, 145-146.

¹¹⁶ CANINA 1830; PAGLIARO *et alii* 2015; PANZIERE *et alii* 2016.

testimonies, representations) in cities such as *Sagunto*, *Gades*, *Onoba*, *Brigantium* or *Campa Torres*. Nevertheless, the importance of these elements in the maritime and port environment as crucial elements in the port organisation, in the prestige and even the monumental character of the port where euergetism and advertising are associated, leads to consider and guess their existence in ports that currently have not offered testimonies but that undoubtedly must have had them. On the same subject, there is a place for all the constructions that can be included within the group of contact structures —wharves, dykes, dry docks, shipyards, etc.— having as a maximum exponent of these structures, in the Hispanic case, those documented in the port of *Oiasso*, a place where there is evidence of (at least) one of each category. On this matter, we are talking about structures that have always been subject to the nature and composition of the place where they are located, which has meant that most of them have disappeared or are in a state of partial preservation, as is the case of *Onoba*, *Gades*, *Baelo*, *Sexi*, *Cartago Nova* or *Ampurias*, among others.

Nevertheless, although the number of testimonies associated with these structures is small, it does not prevent from this synthesis the idea of an intentional arrangement of them, keeping a structured and standardized relation between their construction and location. Thus, we can evince the existence of a pattern in the construction of those ports whose tidal impact is determined by the existence of large open coves, an area that will require the construction of large dykes and wharfs set out countertide, as is the case of almost all the ports of the Levantine watershed. Here, the existence of structures such as those documented in the underwater area of the *Arse Saguntum* port, 30 m and 130 m long, respectively, are evidence of a search for structural solutions to a problem derived from the currents that those ports sheltered by mouths or estuaries did not have, as is the case of *Onoba*, *Olisippo*, *Hispalis* or *Oiasso*. Although the latter had docks, they were far from being big breakwaters constructed with large-sized elements, and if we also consider the singularities that seem to correspond to these ports whose commercial influx must have been significantly more intense, the layout of these contact structures in the ports seems to be more dependent on the needs of the trade itself than on the search for shelter or protection from the tides.

Based on the revision of the archaeological data as well as specific indirect indicators, it can be considered, as a last resort, that the Hispanic port cities, both fluvial and maritime, disseminated and adopted a series of architectural and topographical port models. From this, we can deduce that similar construction programs were inspired by the great Mediterranean port models, such as *Ostia/Portus*, *Carthago*, *Caesarea*..., all of them settlements with nexus and connections. The commercial networks formed by Rome in the ancient world reflect the transfer not only of products but of knowledge, ideas, materials, and construction techniques coming from other Mediterranean sites that are the key to that dissemination.¹¹⁷ Only through this phenomenon can

we explain the adoption of certain solutions, monumental public architecture makes them participants in a series of models —with a different format— that respond to common architectural programs that should and deserve to be profoundly investigated; *lanternae/pharos*, *scholae*, *thermae*, *horrea*, etc. Thus, we consider that, at the basis of the development of these port cities, the adoption of certain models is due to the relationships with first-class Mediterranean settlements such as *Puteoli*, *Portus* or the *Emporium* itself, an area where they received, reviewed, and administrated goods that formed part of the Tiberian port of Rome.¹¹⁸

The current data of the different Hispanic ports allows us to deduce, despite the doubt of the existence of loading bays or docks, that they are authentic port settlements, with infrastructures for unloading, storage, administration, etc. defined or characterized by what are called ports in their terrestrial environment.¹¹⁹ This is a knowledge that has been acquired due to multidisciplinary research that allows us to understand their functioning and their representation in the urbanism of the different port settlements, places with different realities because of their topography, structures, economy, organization, society, rituals, euergetism, legal and administrative aspects, etc.

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¹¹⁷ DE PAZ/RUIZ 2017.

¹¹⁸ SEBASTIANI/SERLORENZI 2011, 71; TUCCI 2012; PENSABENE 2017.

¹¹⁹ CEREZO 2017, 437-445.

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