

Research on transport amphorae and the storage of food and liquids during the pre-Roman period.

Recherches sur les amphores de transport et stockages alimentaire et liquide dans la période préromaine.

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• **Résumé :**

Les amphores antiques préromaines tiennent une place importante dans les recherches sur des spécialistes de la poterie ancienne. La question des domaines d'utilisation (Stockage et transport), de l'origine de fabrication, des collections d'argiles, de l'étendue de l'évolution morphologique et technique au fil des siècles, font partie des questions largement étudiées à ce jour. Si certains ateliers de fabrication ont identifié une petite catégorie d'amphores en Méditerranée centrale et occidentale, en Sicile, en Sardaigne et en Espagne, nombre d'entre elles demeure à l'étude, d'autant que les formes sont similaires et que l'argile varie d'une région à l'autre, ainsi que les utilisations. Le problème d'identification, de répartition et même celui de l'étendue de l'utilisation des amphores antiques entre les VIII^e siècles avant JC et le III^e av. JC, qui coïncide donc avec la période phénico-punique, est à ce jour remise en question, en dépit des avancées de la recherche en ce domaine au cours des vingt dernières années.

Mots clés : Amphore, phénico-punique, autochtone, stockage, transport.

Abstract:

Ancient pre-Roman amphorae held significant importance among experts in ancient pottery studies. Key research areas include their uses for storage and transport, the production origins, the types of clay used, and the extent of their morphological and technical evolution over the centuries. While certain manufacturing workshops have identified a limited category of amphorae in central and western Mediterranean regions, such as Sicily, Sardinia, and Spain, many remain to be investigated. This is particularly relevant given the similarities in forms and the variations in clay across different regions, along with their various uses.

The issue of identification, distribution, and of assessing the extent of ancient amphorae use from the VIIIth century BCE to the IIIrd century BCE—coinciding with the Phoenician-Punic period—remains a subject of ongoing debate today, despite significant research advancements in this field over the past two decades.

Keywords: Amphorae, Phoenician-Punic, indigenous, storage, transport.

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- **Introduction**

Antique Iron Age amphorae are crucial for understanding ancient pottery, offering insights into the cultural, economic, and technological practices of past civilizations. These vessels, used for storing and transporting goods like oil, wine, and grains, reflect the needs of the societies that created them, highlighting trade networks and daily life.

As stated above, key research areas include the origins of amphora production, with a focus on identifying workshops, regions, and artisans' techniques. The types of clay used are significant, as they can reveal geographical origins and trade routes.

Scholars also study the morphological and technical evolution of amphorae, examining how design changes reflect societal trends, trade practices, and cultural exchanges. While some workshops in the Central and Western Mediterranean have been identified, many amphorae remain unstudied, complicating classification and understanding due to similarities in forms and clay variations.

The similarity in the shapes and quality of clay among various types of amphorae that circulated during this period, including Phoenician, Greek, Iberian, and even local varieties, presents significant challenges for classification due to their shared morphological characteristics. This complexity is further compounded by the absence of a clear relationship between form and technique, despite some research efforts in this area (Lattara Andres et al., 1993). In light of this situation, the only comprehensive reference addressing this type is found in the study of amphorae from the Phoenician-Punic period, specifically the work by Spanish researcher Juan Ramon Torres titled "*Las Anforas Finicio-Punicas del Mediterraneo central y occidental*" (1995). In this work, he thoroughly examines the shapes and manufacturing models of amphorae in the central and western Mediterranean, as well as identifying the types of clay used in this category and their applications in storage and transport.

The Phoenician-Punic amphora

It is known that during the initial voyage of the Phoenicians to the central and western Mediterranean, they transported artificial containers in the form of amphorae manufactured in the Levant (Eastern Mediterranean). However, excavations in the western Mediterranean have not yielded any elements of these amphorae that can be distinctly attributed to this region as the original industry for this type. Currently, there is no archaeological evidence or material that has been identified to confirm this assertion (Ramon, 1995, p. 268).

The earliest Phoenician amphorae discovered in the central Mediterranean, particularly in Cyprus, Greece, and Cyrenaica, provide archaeological evidence indicating that Phoenician settlement in the region was stable and well-organized. Specifically, the amphorae found across these sites during the latter half of the VIIIth century BCE, in addition to those uncovered in North Africa, Spain, or Italy, correspond to local production workshops. Initial archaeological investigations have not revealed the presence of amphorae attributable to manufacturing workshops in the Lebanese, Palestinian, or Cypriot regions. Therefore, it can be asserted today, in support of the chronology of Phoenician colonization in the central and western Mediterranean, that the Levantine jars and

amphorae exported to these areas predate the year 750/740 BCE (Ramon, 1995, p. 270). Nonetheless, no examples of this category have been found to date in the western Mediterranean.

The earliest evidence of Phoenician amphorae in the western Mediterranean can be traced back to the latter half of the VIIIth century BCE. However, classifying and mapping these groups from that time remains quite difficult. The current distribution map for this category has been identified in production centers, especially in certain regions of the central Mediterranean, before the end of the VIIIth century BCE. These amphorae were discovered in Carthage prior to its rise as a regional power. The oldest Phoenician amphorae, specifically types T-3.1.1.1 and T-3.1.1.2, were typically packaged in their place of origin in the East, serving as means of commercial transport (Ramon, 1995 p.271).

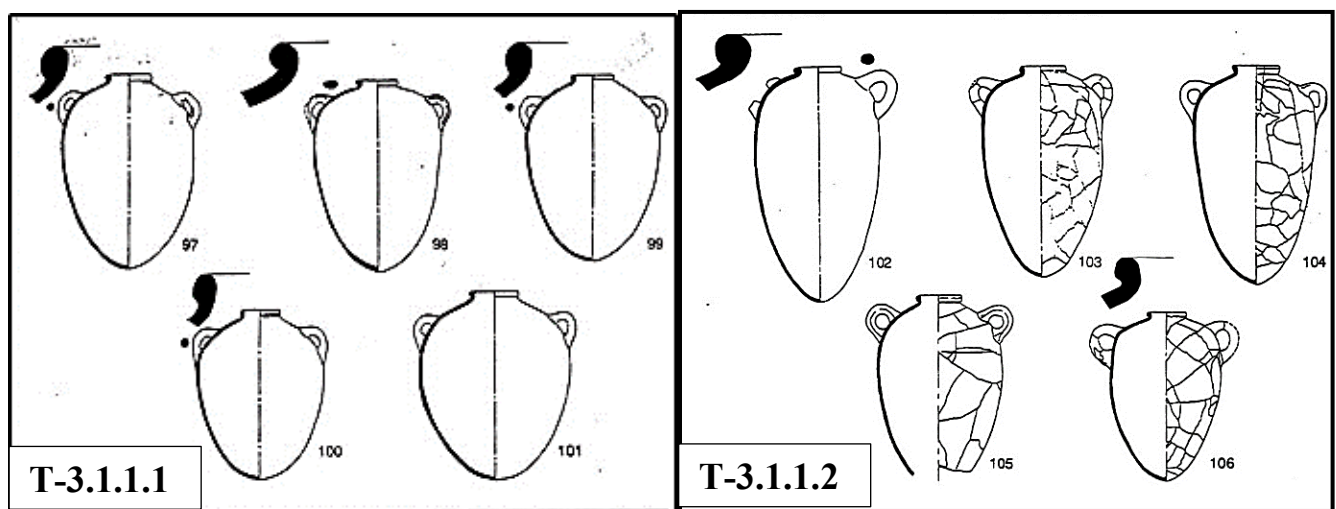


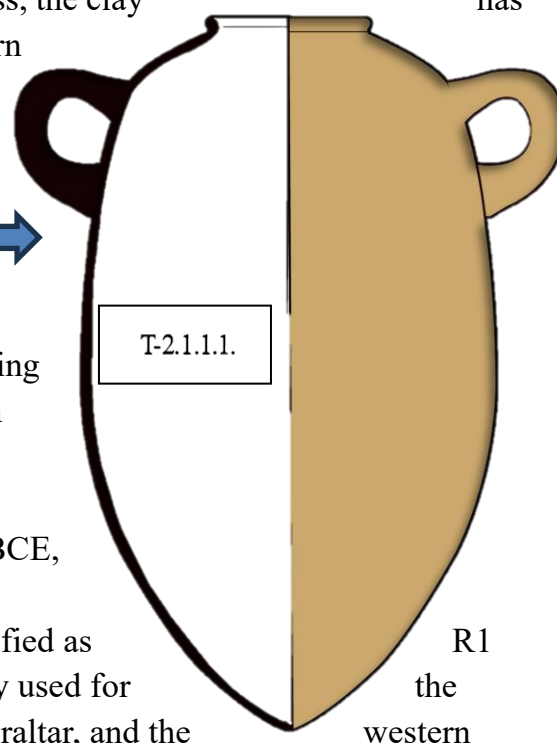
Figure No. 1. The oldest amphorae
– before the VIIIth century a. JC. M- (Ramon, 1995)

Other variations of the T-3 type, dating back to the VIIIth century BCE, have been found in Carthage, especially at Mozia in Sardinia. The origin of their clay is still unknown, as it does not match any of the paste groups identified by Ramon Torres, whose clay and production workshops are situated in the central and western Mediterranean, which leads to the hypothesis that their production could have taken place in workshops located in the Levant (Ramon, 1995, p. 272).

During that same period, the T-10.1.1.1-shaped amphora emerged across all Phoenician settlements in the far western Mediterranean. This particular amphora is referred to as the Malaga type, named after the original production sites located in Malaga, Spain, and is dated to a period prior to 726 BC. Consequently, the production of this category is regarded as local manufacturing (Rouillard, 2010).

At the end of the VIIth century BCE (625 BCE) and extending to the beginning of the Vth century BCE (475 BCE), a new type of amphora emerged, referred to as the T-2.1.1.1 amphora according to Ramon Torres's classification, as well as the R1 classification established by Gustave Vuillemot (see Figure 2). This amphora is characterized by its general features, particularly its convex oval shape with a non-linear circular rim on the exterior, and its rounded shoulders to which semi-circular handles are attached, positioned directly above the body. It has been found in three regions of central Mediterranean: Sardinia, Tunisia, and western Sicily. However, this type of amphora has not yet been clearly identified, and the production workshops remain unknown, even in the areas where this type has been discovered. Nevertheless, the clay has been associated with the "Carthage-Tunisia," "Mozia-western Sicily," and "Sardinia" groups due to the similarity of their characteristics.

Figure No. 2. Amphorae T -2.1.1.1 (Ramon T, 1995, p.373)



The T-shaped amphora, designated as 10.1.2.1, emerged during the latter half of the VIIth century BCE and was produced in significant quantities in the southern colonies of Andalusia. Archaeological findings have been made at sites such as Mogador and the Iberian coastline, dating from 625 to 575 BCE, as well as along the western coast of Algeria, particularly in Rachgoun, Marsa Madagh, and the Andalouses, and is classified as by Gustave Vuillemot. This type of amphora was extensively used for trade of goods within the Iberian Peninsula, the Strait of Gibraltar, and the coasts of North Africa, reflecting an active industrialization process characterized by the development of ports and a new maritime transport route during the VIth century BCE (Vuillemot, 1965).

2. Phoenician amphorae from the far western Mediterranean

There are two types of these amphorae that were produced and traded in the far western region of the Mediterranean basin.

2.1 Amphora type (T-10.1.1.1)

The "Vuillemot" classification of amphorae R 1 and jar R1a from the island of Rachgoun closely corresponds to two ancient types of western Phoenician amphorae, which, according to Torres-Ramon, are represented by amphorae T-10.1.1.1 and T-10.1.2.1. The shape may also align with amphorae T-2.1.1.2, albeit with some reservations, particularly from a typological perspective. A significant number of pottery

shards from amphorae T-10.1.1.1 have been discovered in various Phoenician colonies in the far western Mediterranean, dating back to before 750 BC.

This form is considered an important amphora model, as it signifies the earliest production in the Phoenician centers around the Strait of Gibraltar, with several examples dating to the mid or second quarter of the VIIIth century BCE (Ramon, 1995, p.230). Key features of this form include a hemispherical body that is widest at the center and tapers to a convex, oval-shaped base. The rim is triangular and extends outward, while the spout is very open, lacking a neck and connecting directly to the shoulders. The handles are semi-circular and are affixed to slightly sloping shoulders. These amphorae typically measure between 60 and 70 cm in height, with a mid-width of 36 to 40 cm, and a spout diameter of 10 to 12 cm. The body usually displays horizontal finishes or moderate circular and parallel lines on the outer surface, often featuring bumps spaced at irregular intervals.

Regarding the paste, this form is linked to the "Bahia-Cadiz" and "Western Mediterranean" groups, as well as the "Malaga" group, which is the most prevalent of this type in the southwestern Mediterranean. Its origins can be traced back to the latter half or the quarter of the VIIIth century to the first half of the VIIth century BCE (Ramon, p. 230). The production sites are located in the Phoenician centers within the Strait of Gibraltar region. This type of amphora, designated as T-10.1.1.1 (Figure 3), bears a strong resemblance to type T-10.1.2.1, characterized by a rim with vertical or slightly inclined lips and a narrow spout (Rouillard and Alli, 2007, p. 265).

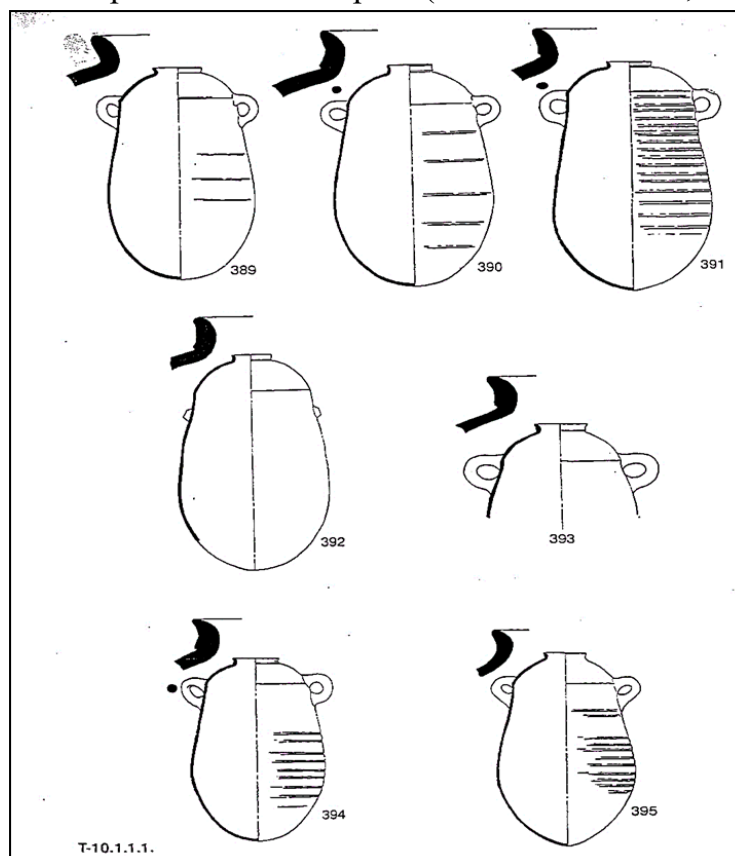


Figure No. 3. T-shaped amphorae-10.1.1.1 (Ramon, p. 230)

2-2 Typical amphora (T-10.1.2.1)

According to Ramon Torres, this type is the immediate successor of type T-10.1.1.1, as identified in numerous Phoenician sites located in the far western Mediterranean. However, the specific centers of production cannot be determined due to its widespread distribution during the VIth century BCE. Additionally, it experienced significant commercial expansion towards the southern Atlantic Ocean (Mogador), the northwestern Mediterranean (Iberian Peninsula), and the central Mediterranean, particularly along the western coast of Algeria (Figure 4).

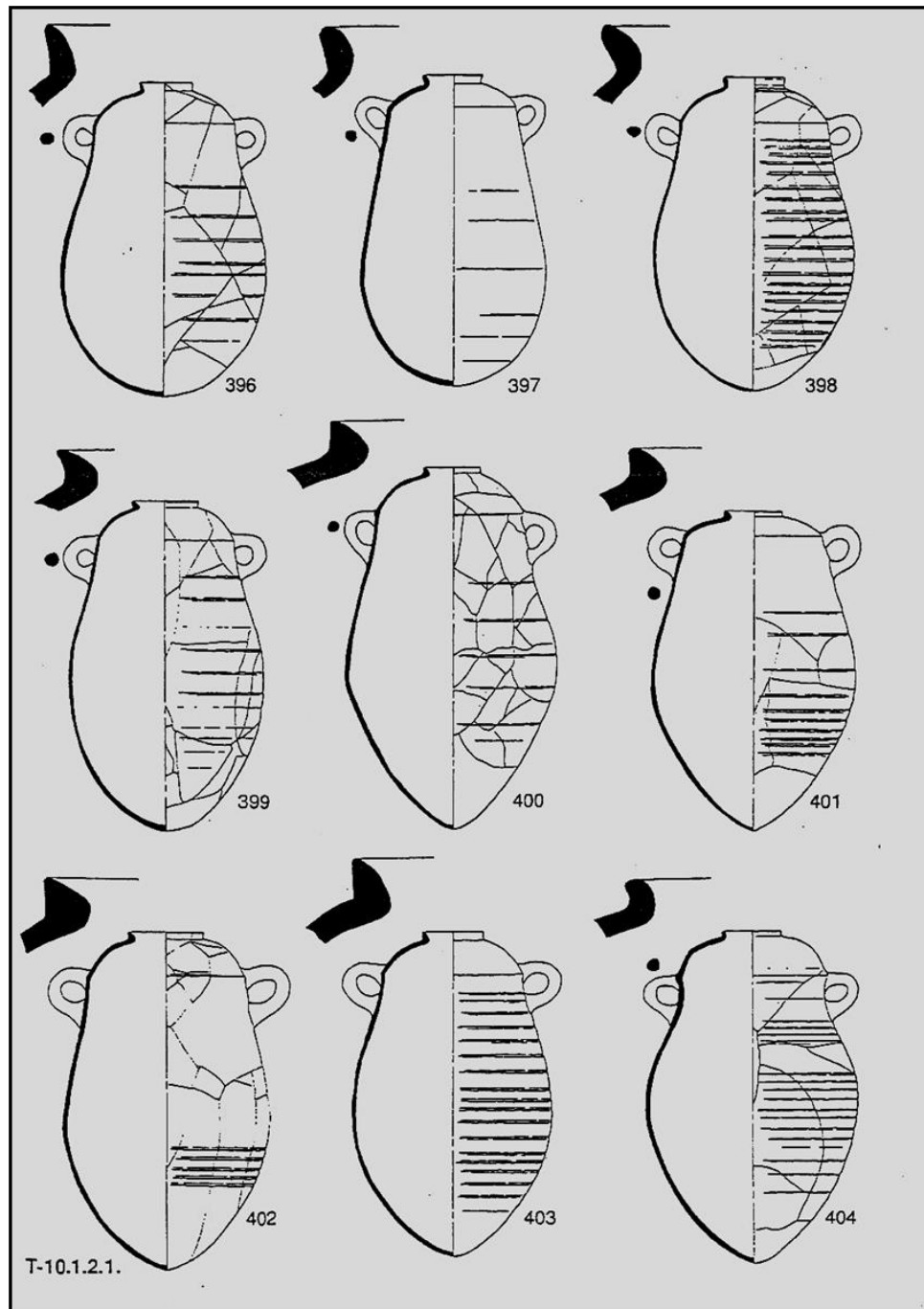


Figure No. 4. T-shaped amphorae-10.1.2.1 (Ramon, p. 230)

The most significant characteristics of this type are as follows:

The rim extends directly over the shoulders of the amphora, exhibiting a triangular shape that may be straight in some instances and oblique in others. It is thick on the inside and occasionally straight. The inner surface of the rim is typically convex, although it can sometimes be concave. The overall shape of these amphorae is oval, with some variations present. It is relatively convex and nearly semi-spherical.

The measurements are as follows:

A maximum length of 65-75 cm, a width ranging from 40 to 43 cm, and a spout diameter of 11 to 15 cm. The exterior surface of the amphorae features horizontal grooves that are unstable, irregular, and permanent in nature, although some amphorae may lack these grooves. The clay used belongs to the "Bahia-Cadesh" and "Western Mediterranean," "Malaga," "Ibiza," and "Creviante" groups, due to the similarities in numerous characteristics of these clays as developed by Ramon Torre.

The discovery of a few marks has been recorded on a small group of amphorae found at the Mogador site. Their interpretation is complex, yet they may suggest production workshops or the nature of goods intended for transport. These amphorae have been dated between 675/650 and 575/550 BCE, originating from various Phoenician centers located in southern Spain and possibly at certain locations along the African coast near the Strait of Gibraltar. Regarding the origins of this industry, it has been traced to areas under Phoenician influence, such as the site of "Pinos Ponty" in Granada and Malaga, dating back to the VIIth century, as well as during the first and second quarters of the VIth century BCE. These manufacturing workshops reflect a concentration of economic and cultural activity among the Phoenicians in this region, as evidenced by findings at the "Peña Negra de Creviante" site and in the colonies of the Gulf of Ibiza in Spain (Ramon, 1995, p. 230).

3. Phoenician amphorae from the west coast of Algeria

The amphorae characteristic of the Phoenician period, with their various types in Algeria, are primarily limited to discoveries made during Vuillemot's excavations along the west Algerian coast: Marsa Madagh, Rachgoun, and the Andalouses, which are currently housed in the National Museum of Ahmed Zabana in Oran.

3.1 The amphora (R1) / (M. M Amph.M.O. n° 01)

Form: These amphorae are pear-shaped with shoulders that curve towards the body (Figure 5). The spout features a slightly obtuse straight edge that extends outward at the beginning. The diameter of the rim measures 12 cm and is triangular in shape, while the interior is semi-circular. The neck is quite short, not exceeding 1.5 cm, resulting in a small "bench" notch on the exterior, while the interior showcases a circular bulge along the inner neck.

Handles: There is only one handle on the right side, as the second is broken. The handle is circular in shape, attached to the upper surface of the body near the shoulder, and on the lower surface, it is affixed at the beginning of the belly. Its length is 10 cm and its width is 7.5 cm. The cross-section of the handle is circular, with a thickness of 2.8 cm.

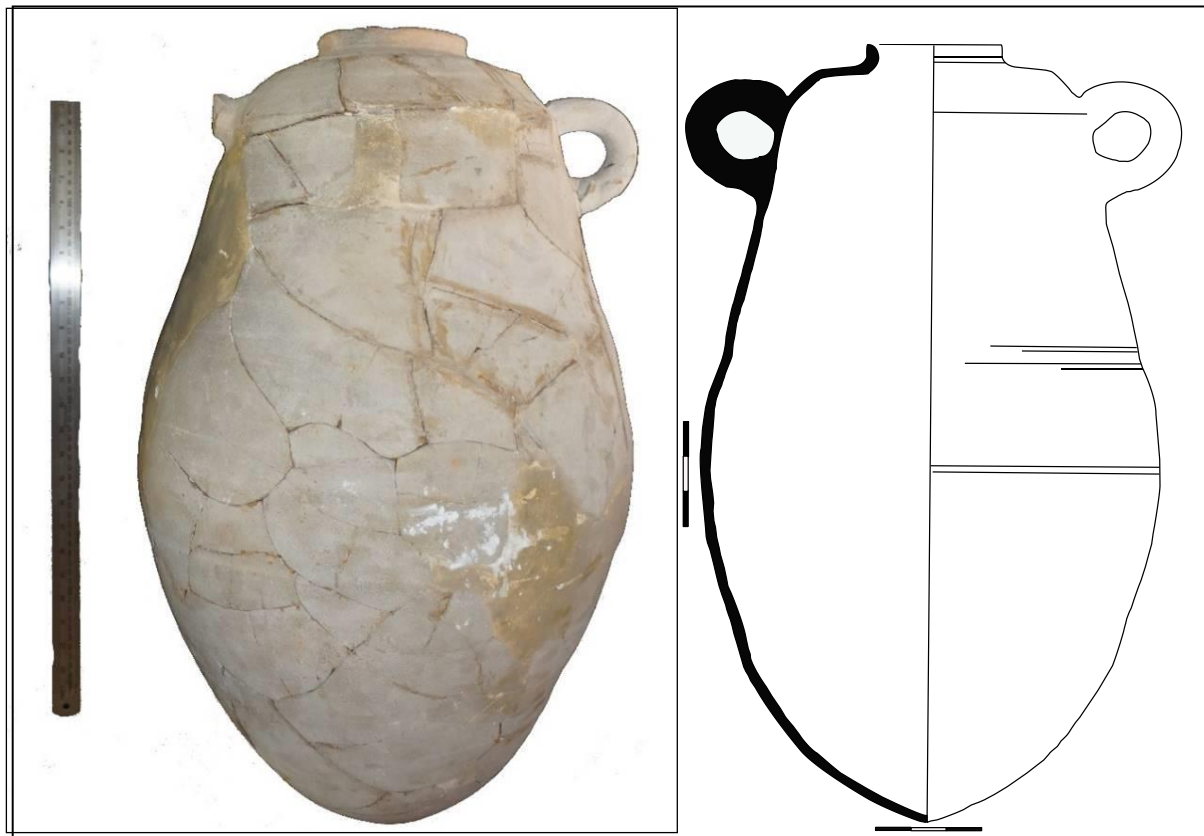


Figure N° 5. The amphora (R1) / (M. M Amph.M.O. n° 01) Madagh (VII c.B.C.)

The body features a broad midsection, beginning vertically beneath the handle, expanding at the center, and tapering towards the base, with a convex exterior and a concave interior.

Dimensions: The amphora measures 96 cm in length from the tip to the base, with a maximum width of 44 cm at the center of the body, including the handle's length.

Material: The clay is coarse, porous, and heterogeneous, displaying a gray-brown colour, transitioning to red and pink at the rim and lip due to firing effects. The core of the clay is gray, containing non-dense black sand grains that are irregularly distributed across both surfaces. Notable are the limestone nodules and large voids present on both sides.

Decoration: The body is adorned with an asymmetrical, circular, and horizontal groove located at the midpoint.

Dating: This artifact is dated between the 7th and 6th centuries BCE (Vuillemot, 1965).

It was discovered at the site of Madagh, located in the Oran province.

3.2 The Punic amphora of Gouraya:

(A-PUN Ch7 / A-PE 14/ A-PUN C2a/ A-PUN C2a)

The Punic amphorae, with their various types, are regarded as the most prevalent among the funerary artifacts found in the two necropolises of Gunugu (Gouraya). This prevalence underscores the close ties that existed between Gunugu and the city of Carthage prior to its fall in 146 BC. Following these events (Missonnier, 1933), Rome was positioned to dominate the Mediterranean markets, facilitating the distribution of its agricultural products during the second and first centuries BC, exemplified by wines contained in Italian amphorae of the Dressel 1b type. Additionally, other amphora types from the Punic tradition, produced in the ancient Carthaginian colonies during the second century BC, were uncovered in the same necropolis during this period on the island of Ibiza, such as the Ramon T-8.1.3.2 type (Ramon, 1995, p. 223). Furthermore, in the first century BC, the Ramon T-7.4.3.3 type was found in the Spanish city of Cadiz and along the Atlantic coast of Morocco (Figure 6) (Ramon, 1995, p. 223).

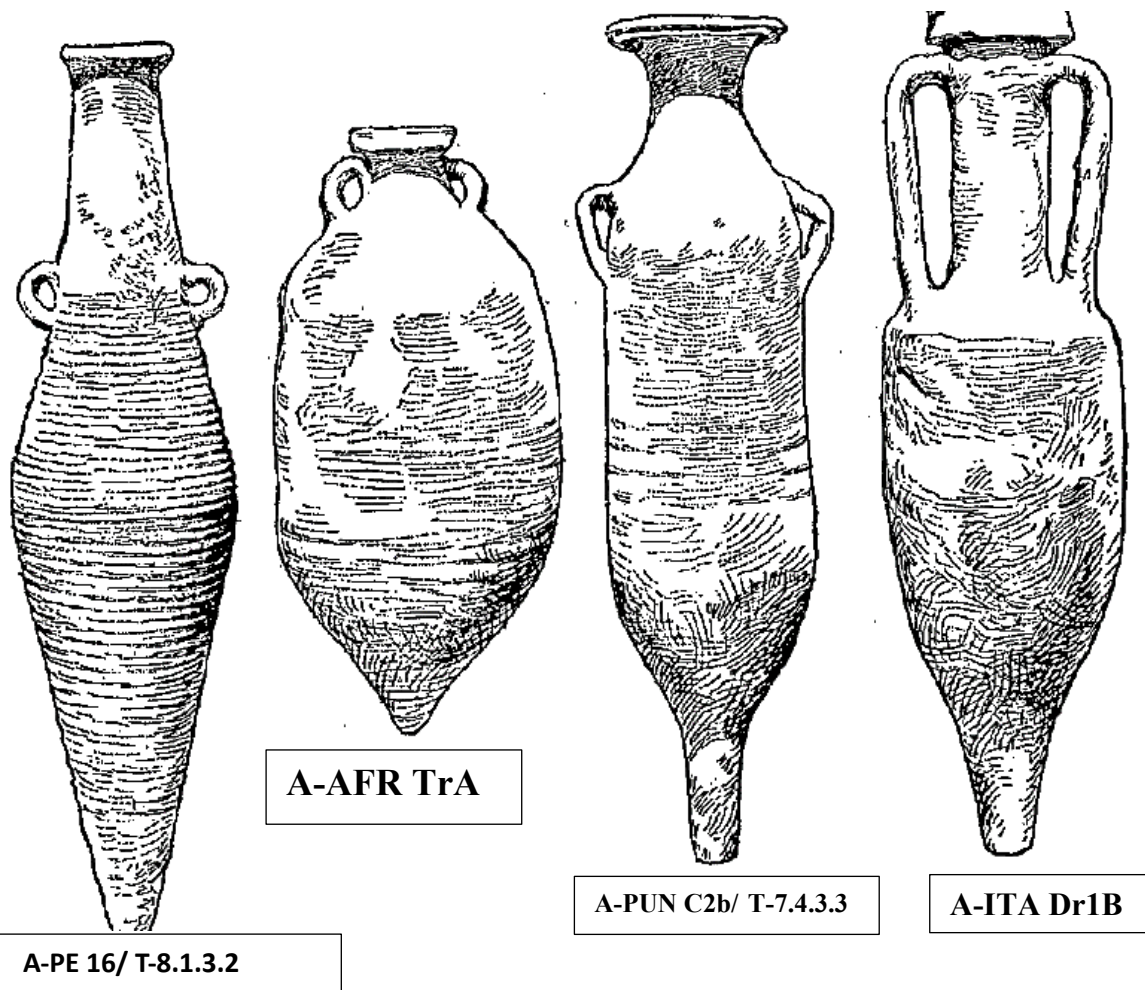
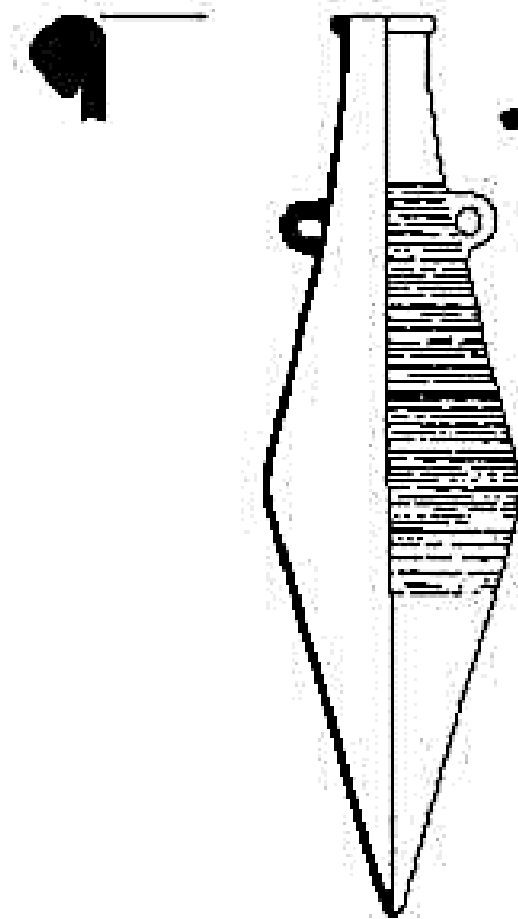


Figure N° 6. A model of Punic and Italic amphorae exported to the town of Gouraya.



A-PE 16

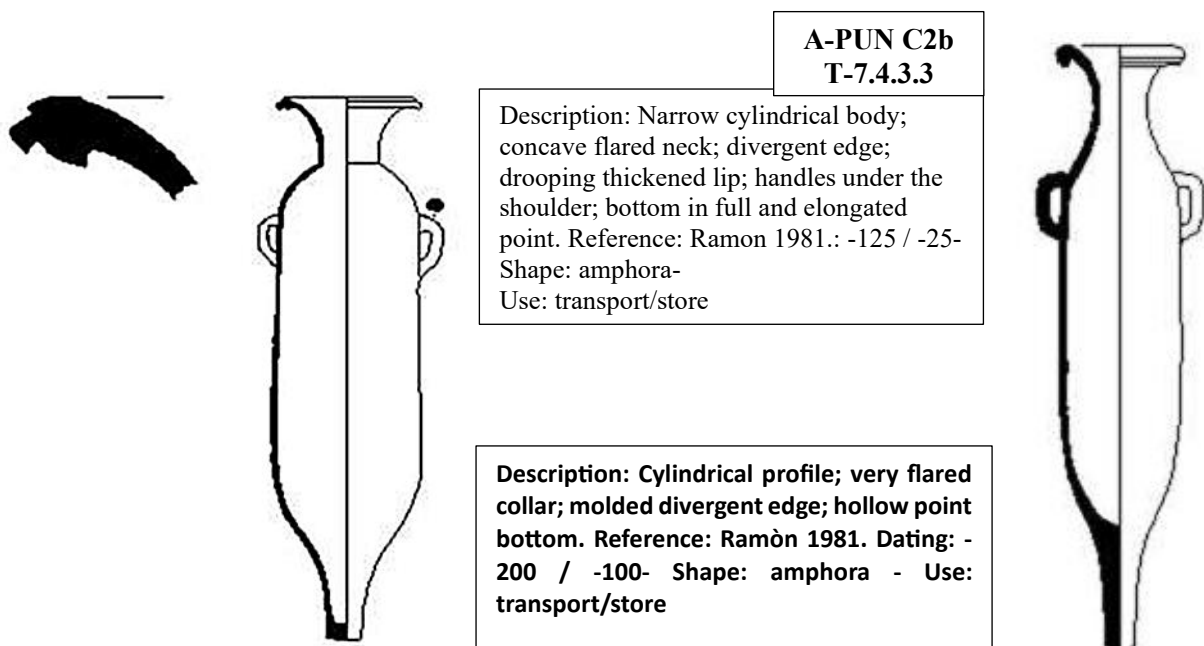
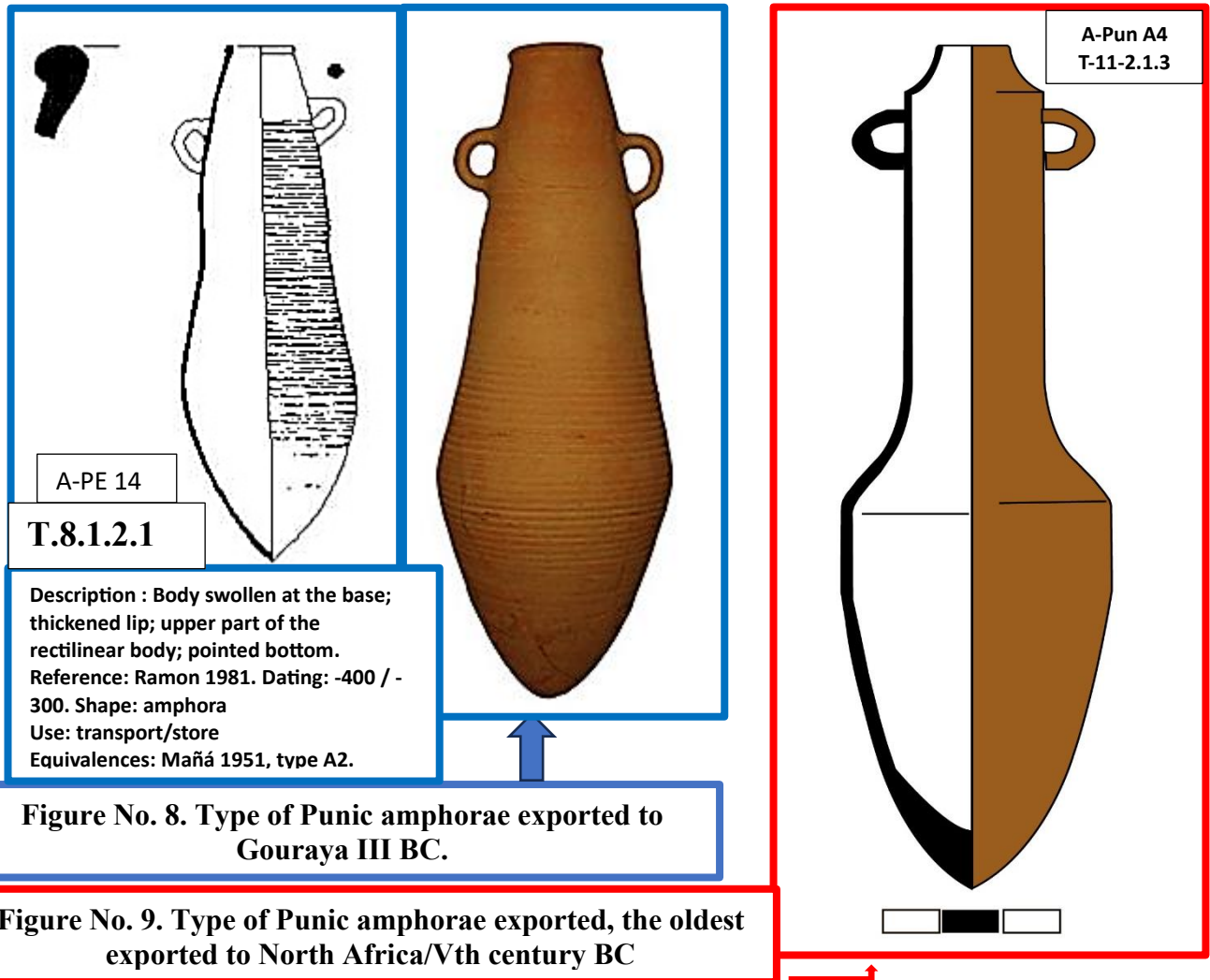


Ou bien : T-8.1.3.2

Description: Bi frustoconical profile; upper part of the belly concave; sausage lip extending the belly, without shoulder; V-shaped bottom. Reference: Ramon 1981. Dating: -250 / -190 Shape: amphora - Use: transport/store Equivalences: Mañá 1951, type E.

The issue of workshop localization, particularly for the earliest periods, remains unresolved. However, it is evident that the concept of 'Phoenician' should encompass certain productions from the southern part of the Iberian Peninsula, which likely includes the majority of the pieces exported to the northern arc of the western Mediterranean (Lancel, 1968).

Another unresolved issue pertains to the contents of these amphorae: according to J. Ramon, most were likely used for transporting wine, although other possibilities exist based on the agricultural production capacities of the Balearic Islands, particularly regarding oil.

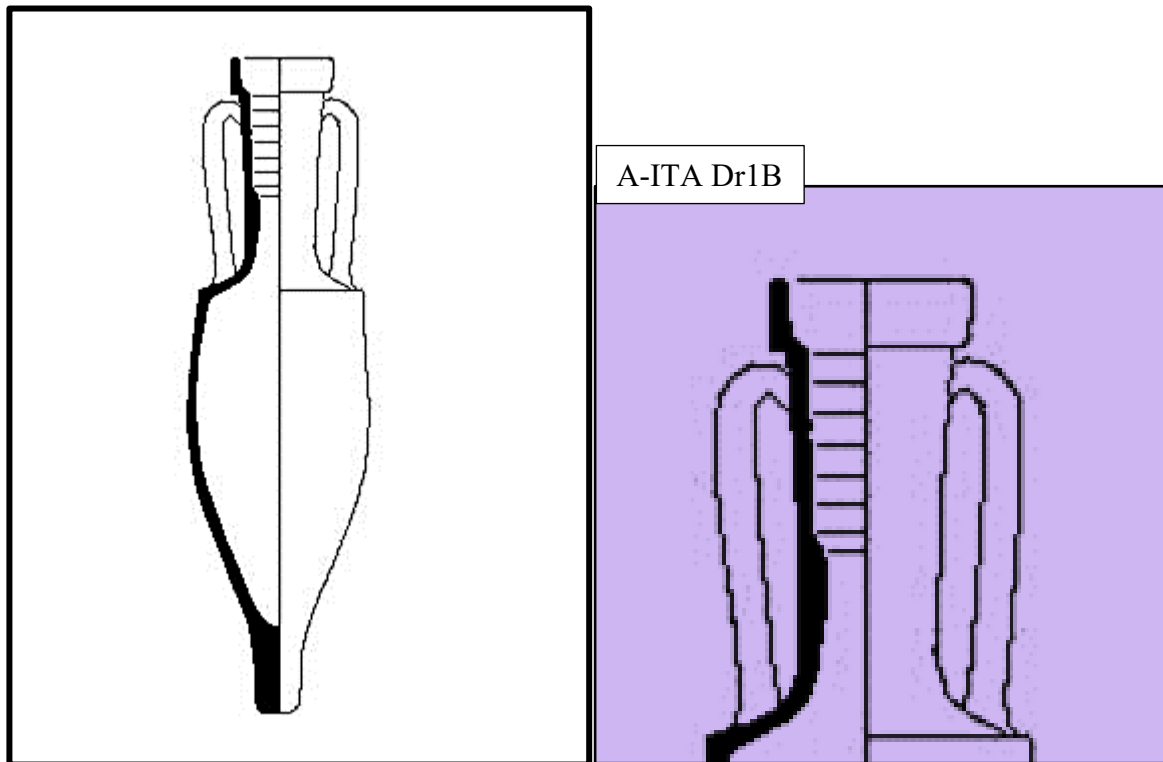


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**A-PUN C2a
T.7.4.3.1**

**Figure No. 10. A model of amphorae T-7.4.3.3
dated to the town of Gouraya/Gunugu (II and I BC)**

**Description:**

The Dr1B variant is larger than Dr1A (height of 110 to 120 cm; capacity 26/27 liters); it is also characterized by a cylindrical neck, a sharp-angled shoulder, a fairly high massive foot (>15 cm), and an equally high band lip (>5.5 cm). - Reference: Dressel 1895 modified by Lamboglia 1955 .- Dating: -100 / -1- Shape: amphora - Use: transport/store
Equivalences: Benoit 1957, “republican IIIB”.

**Figure No. 11. A model of italic amphorae (Dressel 1b)
Exported to the town of Gouraya/Gunugu (first century BC)**

4. Areas of use for amphorae:

The concept of the amphora emerged alongside the human necessity to store materials and food products, as well as the inception of early commercial activities based on the principle of barter in trade since antiquity. As humans expanded their trade to more distant regions, there was a need to increase production and specialize in the manufacture of amphorae. Specific shapes of amphorae were associated with particular types of food that were preserved and transported from one location to another. Amphorae were used to carry a variety of goods, including wine, oil, grains, fish sauce, and other food products. Owners identified the contents of the amphorae by inscribing the information on the exterior surface, either through painting or using a pointed writing instrument (Bartoloni, 2012).

Recent findings regarding the T-10.1.2.1 amphorae, particularly those discovered at the "Hemera" site in Sicily, near Carthage, suggest that this Greek colony was regarded as one of the transit centres for the shipment of goods from southern Spain to the east. Concurrently, "Hemera" served as the primary distribution center for the marketing of liquids and dry grains using this type of amphora (Babette, 2015). Although this pottery type is associated with commercial activities in the

Iberian Peninsula during the late VIIth century and the early VIth century BCE, some sources occasionally link it to pre-Iberian pottery, as it is challenging to categorize it as akin to Phoenician production. The T-10.1.2.1 amphora, or (R1), is also designed for the storage of cold water, as its broad body allows for the retention of a substantial volume of liquid. Numerous fragments of pottery of the same amphora type have been unearthed in the initial layer of excavations at Rachgoun, dated to the VIIth century BCE, and at Madagh, dated to the VIth century BCE. This same type has also been located at "Motié" in Sicily, "Nora" in Sardinia, and "Mogador" in Morocco. Economic relations among the Phoenician colonies underwent significant transformation following the "Iberian crises" in the latter half of the VIth century BCE, particularly with the rise of Carthage as a dominant Punic power in the region. This shift linked commercial activities in the Strait of Gibraltar to the industrial-scale marketing and export of fish (Morel et Camps, 1999) has decrease, leading to a decline in the export of certain amphorae types before they were supplanted by the T-11-2.1.3 amphora from the "Ramon Torres" classification.

The Punic amphorae, categorized as (A-PUN Ch7 / A-PE 14/ A-PE 15/ A-PUN C2a/ A-PUN C2a), unearthed during excavations at Gouraya, are generally regarded as transport vessels for two primary products: wine and garum (a type of fish sauce). Some amphorae appear distinctly associated with one of these commodities—specifically, archaic Phoenician amphorae for wine and those from the Eastern Circle for garum. However, it remains challenging to ascertain the specific products of Central Mediterranean origins.

Regarding the Italic amphorae of the "Dressel" type (A-ITA Dr1B), it is widely accepted that this category was primarily utilized for the transportation of wine.

Conclusion :

This period of the Early Iron Age in North Africa was marked by a significant export of Phoenician amphorae T-10.1.2.1 to the Atlantic coasts and the northwestern Mediterranean (Ramon 1995), as well as to other regions of the western Mediterranean basin, such as the western Algerian Sahel, specifically at the sites of Rachgoun, Marsa Madagh, and Andalouse, along with other locations along the central coast of Algeria, including Gouraya and Tipaza (Boussadia, 2015). This type of amphora saw a decline and was subsequently replaced by the T-11-2.1.3 amphora from the "Ramon Torres" classification around the Vth century BCE. The distribution of these amphorae varies by type and chronology: it is now recognized as quite extensive, ranging from the earliest products imitating Phoenician amphorae in the early VIIth century to the period of Romanization along the western Algerian coast, extending even into the first century. Furthermore, other types of amphorae belonging to the Punic tradition, produced in the ancient Carthaginian colonies during the second century BCE, have been found in the same cemetery during this period on the island of Ibiza, specifically the Ramon T-8.1.3.2 type (Ramon, 1995, p. 223),

and during the first century BCE, the Ramon T-7.4.3.3 type was discovered in the Spanish city of Cadiz and along the Atlantic coast of Morocco (Ramon, 1995, p. 223). Additionally, A-PE 14, a type of Punic amphora for transport and storage, was exported to Gouraya in the third century BCE.

An unresolved issue remains regarding the contents of these amphorae: according to J. Ramon, most were likely used for transporting wine, although other possibilities exist based on the agricultural production capacities of the Balearic Islands, particularly concerning oil. Nevertheless, the primary function of the amphorae remains to preserve and transport goods, whether they be foodstuffs or various liquids.

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