

The production and circulation of Greco-Italic amphorae of Campania (Ischia/Bay of Naples)

The data of the archaeological and archaeometric research

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Abstract – This paper presents a summary of the data and the problems encountered with the production and spread of Greco-Roman amphorae (particularly the oldest types). The starting point is the island of Ischia where in the 4th and 3rd centuries BC Greco-Italic amphorae with Greek stamps were manufactured. The study of amphorae from Ischia/the Gulf of Naples enables a more precise definition of the production and the export of Campanian wine as well as the economic situation in that area in the Republican era.

Typological, epigraphic, and archaeometric data contribute to the reconstruction of trade patterns from Campania in the western Mediterranean.

Further information concern new studies on shipwrecks with Greco-Italic amphorae and a database being currently established of archaeological and archaeometric data of Italic ceramics.

Inhalt – Der Beitrag fasst Fakten und Probleme zusammen, die mit der Produktion und Verarbeitung gräko-italischer Amphoren (besonders der ältesten Typen) verbunden sind. Ausgangspunkt ist die Insel Ischia, wo im 4. und 3. Jh. v. Chr. gräko-italische Amphoren mit griechischen Stempeln hergestellt wurden. Das Studium der Amphoren von Ischia und dem Golf von Neapel ermöglicht es, Produktion und Export kampanischer Weine und die wirtschaftliche Lage jener Region in republikanischer Zeit genauer zu erfassen.

Typologische, epigraphische und archäometrische Daten tragen zur Rekonstruktion der Gestaltung des Handels von Kampanien in das westliche Mittelmeergebiet bei.

Weitere Informationen betreffen neue Forschungen zu Wracks mit gräko-italischen Amphoren und eine im Aufbau befindliche Bank archäologischer und archäometrischer Daten zur italischen Keramik.



1. The origin of Greco-Italic amphorae: an important discussion for the reconstruction of trade between the 4th and 2nd cent. BC.

The study of Greco-Italic amphorae allows the collection of important information concerning the economic situation of central-southern Italy between the middle of the 4th and the 2nd cent. BC, and in particular, the production and circulation of wine.

The general problems relative to these containers have been discussed previously in published articles (which should therefore be referred to for a general introduction to the topic¹), and is not the subject of this current contribution. The aim of this current work

is to instead present the data and some preliminary results concerning the circulation in the western Mediterranean of Greco-Italic amphorae, which have previously been defined by the author as “from Ischia/Bay of Naples”.

Until now there has been little information concerning the production centres of ancient Greco-Italic amphorae between the end of the 4th cent. and the 3rd cent. BC: Ischia was one of these centres and Naples was in all probability a further equally important centre. There is still little information concerning the production of northern Campania, where the type V amphorae of C. Vanderersch, which have a fabric rich in volcanic inclusions, different from those of the area around the bay of

Naples, have been recovered from necropolises of the end of the 4th – beginning of the 3rd cent. BC².

There exists considerably more information concerning the production centres of late Greco-Italic (types V/VI and VI)³ amphorae and the development towards the Dressel 1 form: a concentration of possible production centres has been documented between Etruria and Campania, with a higher density in the area of southern Lazio and northern Campania⁴.

This article will refer particularly to the period between the end of the 4th and 3rd cent. BC and to the oldest types of Greco-Italic amphorae, the types IV and V of C. Vanderersch's typology, whereas the 2nd century and types

V and V/VI will only be briefly referred to, as they are still the subject of current ongoing research.

New data – archaeological, epigraphical and archaeometrical – confirms that these often are containers originating from the Bay of Naples and, in several examples, more generally from the area of Campania. Whilst there were many areas involved in the production of wine in southern Italy, which have been the focus of attention in recent years⁵, the importance of the Bay of Naples as a key area in the production of the oldest and latest types of Greco-Italic amphorae (and the wine which they contained) is pointing towards a better definition⁶. The Greco-Italic amphorae of this area had a wide diffusion even before the Punic Wars, and their circulation was probably contemporary to that of the “archaic” or “primitive” black-gloss ware of the workshops of the Bay of Naples, which have been found in several western Mediterranean centres (for example Ensérune in southern France and Aleria in Corsica) as well as in the Punic centres in Sicily and northern Africa⁷.

Ultimately, the current ongoing research is bringing to light ever more clearly the presence of a circulation (although this is still at limited and “experimental” stage) of amphorae and Campanian pottery exported from the bay towards the southern Tyrrhenian and the north African coast and other centres on the trade route (it can also be seen in the north-western Mediterranean area), already a century before the main flow of exports of Campanian products. This phenomenon, which has until now possibly been to some extent underestimated⁸ and which merits further systematic investigation in the future, demonstrates the centrality of Campania in both the trade network within the Mediterranean, and the production of wine transport vessels as well as possibly some other products.

The new research being conducted⁹ allows the reconstruction of the production and the circulation of materials from the workshops of the Bay of Naples: from the moment of their production, their transportation (through the analysis of the cargos of ships, which document journeys interrupted by the sinking of the ship), and the presence of these containers at sites where they were consumed.

The research which has already been undertaken, although limited to a few sites and shipwrecks and therefore liable to future development and modifications, does not permit, in a similarly clear manner, the identification the presence of Greco-Italic amphorae originating from Sicily or from Magna Graecia, therefore adjusting the importance which this area would have had in the widespread commercialisation of amphorae and wine in this period. If the wine of Sicily was widely exported in this period, it is possible that it was transported in “punic” amphorae originating from Sicily, as evidenced by the work of Ramon Torres 1995.

2. The production of amphorae in the Bay of Naples: the workshops of S. Restituta at Lacco Ameno and the recent discoveries in Naples

The research conducted at Ischia (the ancient Pithekoussai), and the current studies being undertaken in Naples, demonstrate that within the Bay of Naples were produced and traded Greco-Italic amphorae from the very moment of the arrival of the Romans, after the stipulation of the *foedus aequum* in 326 BC. Indeed, the Bay of Naples, following this pact of alliance which tied influential Roman families to leading Neapolitans and to the Greek merchant class and, thanks to the loyalty displayed by the Neapolitans towards the Romans, found itself living in a privileged position of economic growth and an increase in the activities of the workshops and trade¹⁰. The port of Naples

is amongst the most important ports between the 4th and the first half of the 3rd cent. BC¹¹. The evidence from the dredging of the seabed, brought to light by the recent work of the Soprintendenza Archeologica di Napoli, demonstrates the intensity of the use of the basin of the port¹².

The production of amphorae increased from the second half of the 4th cent. BC, due to the diffusion of *Aminea* grapes within the area of the bay: in Naples, the grapes were cultivated on the hills of the city, therefore maintaining the Euboean viniculture tradition in the city (the cult of Dionysos, the onomastics associated with wine)¹³. The *eukarpia* of Pithekoussai is recalled through the ancient sources¹⁴ and the island was also important in the production of wine at least until the 1940s.

2.1 Ischia

Whilst it has been known for sometime that wine was produced on the Bay of Naples, until now there has not been the archaeological data necessary to reconstruct and identify the local amphorae, from a point of view of their typology, epigraphy and archaeometry.

The study of amphorae from Ischia started somewhat by chance, on the occasion of the excavations conducted in the district of the pottery workshops of Lacco Ameno, at the foot of Monte Vico, where in the 1950s Don Pietro Monti, rector of the Basilica of Santa Restituta, discovered several kilns underneath the church on the slopes of Monte Vico¹⁵.

In the 1990s¹⁶ a project was undertaken, together with W.-D. Heilmeyer of the Freie Universität Berlin and in association with the Soprintendenza Archeologica di Napoli, financed by the Fondazione Thyssen, to re-examine this site and to study the material. Whilst the excavations had been undertaken unsystematically, the material which was recovered contributes greatly to the knowledge



of the activity of the workshops and the production on the island which, as previously noted, was a fundamental place for the production of pottery, starting from the period of the colonisation, due to the quality of the clay¹⁷. Three of the six kilns which were discovered have been dated through thermoluminescence to a period between the 4th and the 2nd cent. BC¹⁸.

Over the course of the re-examination of the material from the old excavations were identified several hundred fragments of Greco-Italic amphorae, amongst which several wasters from the kilns. The fragments consist mostly of stamped handles, several rims and spikes. The types of Greco-Italic amphorae documented on Ischia include the types III and IV, possibly the V and the V/VI of Vandermersch's classification. The several hundred stamps which originate from the different areas of Pitecusa have Greek (probably of Ionian-Euboian origin) and Oscan names, written in Greek¹⁹.

During the Hellenistic period the kilns of S. Restituta also produced coarsewares and finewares, as well as bricks and stamped loomweights. The abundant amount of locally produced material, manufactured over a long period of time, has provided an ideal starting-point for the laboratory analysis.

2.2 Naples

Whilst a first article about the amphorae of Ischia was published²⁰, the excavations undertaken during the construction of the Underground in Naples, directed by D. Giampaola of the Soprintendenza Archeologica di Napoli²¹, brought to light pottery and amphorae, above all Greco-Italic types, in an area close to the port, already known due to the discovery of dumps of black-gloss ware and where a public building dating to the 4th/3rd cent. BC was discovered, within the area of a sanctuary in front of the walls²². Unexpectedly, and over the course of a

short period of time, it has been possible to further the study of the production (and also the circulation) of amphorae and wine.

The ongoing research at Ischia and Naples aims to better define the pottery production at these two sites. The recurring objective of the study of material culture of the Bay of Naples is to separate and identify the pottery production of Ischia from that of Naples (discussions concerning the production of black-gloss ware are still ongoing). This operation is somewhat difficult as the two share the same crafts heritage and the epigraphic data reflects a shared social and historical background; indeed, even the application of laboratory analyses cannot always be guaranteed to resolve the problem, considering the similarities of the clays within the bay²³. Finally there also exists lacunae and discrepancies within the data; in the example of the amphorae, at Ischia above all have been documented the stamped handles and very few diagnostic fragments. Furthermore, on both sites have been discovered local wares and a significant amount of material that has been imported between the two places (at Ischia has been found pottery from Naples and vice versa).

At this point it should also be highlighted that, in the period between the 4th and 2nd cent. BC, that is the period which sees the appearance of black-gloss ware and Greco-Italic amphorae, the island belonged to Naples and possibly functioned as an extended workshop district. This was probably due to its strong tradition in pottery and metallurgy, which dates back to the time of the Greek colonisation²⁴.

Whilst the research continues in the direction of differentiating the material culture of the two sites, it will however be the joint data of both Ischia and Naples which will provide a complete picture of the production and trade within the bay, allowing a key reading of the economic history²⁵.

3. Production and circulation of amphorae of the Bay of Naples: the contribution of the archaeometric research

There were probably several workshops on the Bay of Naples involved in the production of amphorae and the current research aims, with the assistance of laboratory analysis, to define the articulation and production method over the course of time. However, it should be remembered that there additionally exists the possibility that the neighbouring areas of the Bay of Naples also shared the same artistic/epigraphic heritage and produced pottery with characteristics similar to that of Ischia and Naples²⁶.

Archaeometry can provide an important contribution in defining the character and distinguishing locally made amphorae, above all if the laboratory has at its disposition chemical and mineralogical data concerning the pottery of the production site (the so-called "reference groups"), which facilitates the comparison of compositions.

Indeed, the determination in the laboratory of the origin of amphorae found on shipwrecks, as well as those found at consumption sites, without secure reference groups, does not always provide positive results. Furthermore, the geological composition between the area of southern Etruria and Campania is very similar²⁷.

As a result of this, a new project financed by the Ministry of Research²⁸ aims to create a database of all the archaeological and archaeometric data concerning the production of pottery in central-southern Italy; furthermore, a series of in-depth analyses will be conducted of the production centres of amphorae and pottery (in Lazio and Campania), as well as a revision and restudy of the cargo of the shipwrecks which are presumed to have originated from this area.



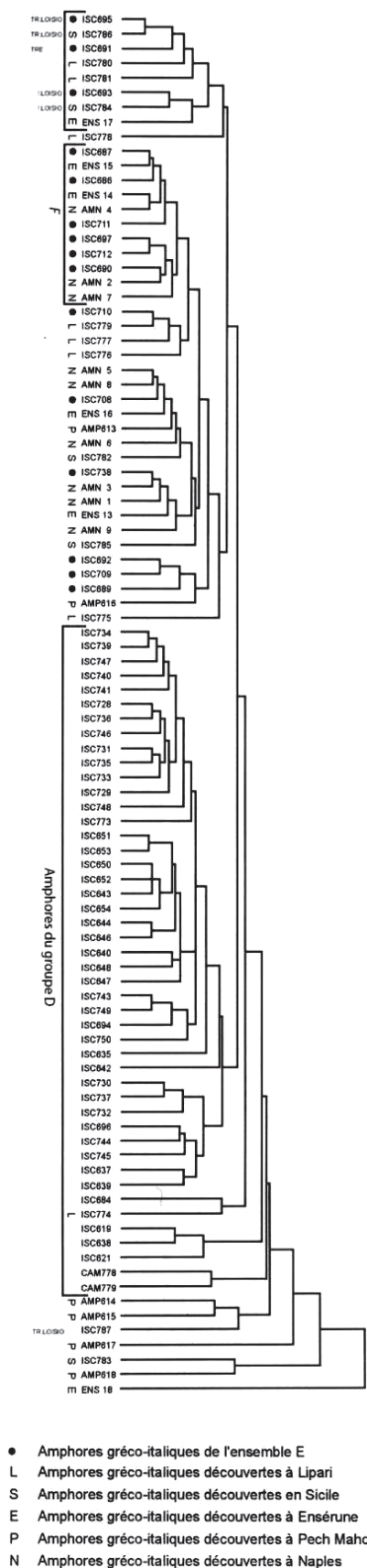


Fig. 1: Cluster of the chemical dates (XRF method) of the amphoras found in Ischia (S. Restituta), Naples (Underground excavations) and in other sites in the Mediterranean; the elements used, are Ca, Fe, Ti, K, Si, Al, Mg, Mn, Zr, Sr, Rb, Zn, Cr, Ni, Ba, V, Ce.

3.1 The analyses performed

The preliminary stage in the reconstruction of the circulation of Greco-Italic amphorae coming from the Bay of Naples has been the study of these vessels at the places of their possible production²⁹. This study has applied various research methods – typological, epigraphic, archaeometric – and is based upon numerous chemical and mineralogical analyses conducted on amphorae found at Ischia, Naples and a selection of sites in Sicily (amongst which the Lipari islands)³⁰.

The characterisation of Greco-Italic amphorae from Ischia has been achieved through a large number of chemical (using x-ray fluorescence) and mineralogical (thin section analysis with a polarised light microscope) analyses of the amphorae, as well as of bricks and local clays. These results are now being prepared for publication.

Amongst the objectives of the laboratory analysis was the definition of the local production, a process facilitated by the existence of wasters from the kilns as well as clay deposits near to the kiln sites; a further objective was the differentiation of local pottery and amphorae from those imported.

As a comparison, so far 10 samples of Greco-Italic amphorae from Naples (Underground excavations) and several sites and shipwrecks in Sicily have been analysed. Further samples have also been obtained from two *oppida* in southern France, Ensérune and Pech Maho³¹ (from the mid-3rd cent. BC phase). At these sites have been discovered vessels with a similar typology and fabric as those from Ischia/Bay of Naples, some of which have the same stamp.

The **chemical analysis** (XRF) of the Greco-Italic amphorae, undertaken in Lyon together with V. Thirion Merle and M. Picon, identified the existence of several chemical groups³² which are formed on the basis of the composition (**fig. 1**).

The most numerous, of local origin, include as well as the amphorae, Geometric period pottery, bricks, commonware, the kiln wasters of varying periods and several samples of raw clay found near the kilns of Santa Restituta. In this group the most dominant are the oldest types of Greco-Italic amphorae (types III e IV).

The other chemical group includes the latest types of Greco-Italic amphorae – type V (and in some examples V/VI) – which for the most part can be provenanced to the Gosetti property (on the slopes of Mount Vico in an area where Buchner identified several dumps, outside of the workshop areas) and to the necropolis of San Montano. The stamps of these amphorae, differing from those of the previous group which have been found only or principally at Ischia, have been documented at other sites and shipwrecks in the Mediterranean.

The first **mineralogical analyses** have permitted the definition of the local amphorae: they contain only volcanic inclusions and have a carbonate matrix with microfossils³³. The Greco-Italic amphorae from Naples, as well as those from the sites in Sicily and southern France which were analysed as a comparison, have a composition similar to that of the second group, which was heterogeneous and which possibly also includes the amphorae produced in other workshops of Ischia or Naples and in other workshops in the bay.

4. The end of the 4th cent. BC and the first half of the 3rd cent. BC: the type IV and V amphorae

A definitive typology of the Greco-Italic amphorae of Ischia and the Bay of Naples is currently being created, together with the team from Naples, through a comparison of the data from the two sites which are being studied³⁴. Presented here is a first tentative attempt to define a typology, based upon the material from Ischia (**fig. 2**).



A first production phase, perhaps the most interesting, concerns the period at the end of the 4th/beginning of the 3rd cent. BC. It should be considered closely with the historical and political developments of the time and, in particular, with the changed situation in Naples, as noted in the previous paragraph.

The production of new container vessels for the storage of wine (or other products?), should be considered within the wider picture of economic growth which characterised the bay after the stipulation of an alliance with the Romans.

The district of the pottery workshops of Santa Restituta at Lacco Ameno, which already existed, was renovated and enlarged with the construction of new kilns for the production of amphorae, bricks and pottery.

The current research will serve to clarify whether this first phase, identified in the kilns of Santa Restituta, occurred also in the workshops of Naples, as seems to be testified by the discovery of

several wasters of the oldest Greco-Italic amphorae during the excavation of the Underground, now being studied by L. Pugliese.

The **type IV** was produced in Ischia and possibly also at Naples, with stamps written in Greek. The amphora has a long tapered body³⁵ and a flat-topped rim, slightly everted; the neck is cylindrical and long. The ridge where the shoulder meets the body has a rounded carination; the handle is long and ovoid in section; the spike is cylindrical and hollow.

Both a larger and smaller form of this type of amphora has been documented, however the fragmentary nature of the data from Ischia has not permitted a better definition of its measurements³⁶. Furthermore, it has not been possible to obtain from the data from Ischia more precise information concerning the chronology of these vessels.

The best preserved amphora from Ischia, found near to kiln 4, is stamped with the stamp ΞEN ;

also attributable to this type are the stamps $Z\Omega$ and ΠAP . This type has been widely documented – between the end of the 4th and the beginning of the 3rd cent. BC – in the excavations of the Underground in Naples³⁷.

The circulation of this type has yet to be fully reconstructed, but an initial indication has emerged from the first verification undertaken of the amphorae and their stamps from several shipwrecks and sites where the products have been consumed; the type IV amphora has been documented with certainty on the Filicudi F shipwreck, as discussed below in further detail, and appears to be orientated above all towards the southern Tyrrhenian, Sicily and perhaps also north Africa.

The **type V**, with stamps in Greek and in some cases Latin, has a more globular and V-shaped body. The rim is not as wide as the previous type and the neck is tronco-conical in shape. The spike is cylindrical and hollow. Several amphorae of this type have a fab-

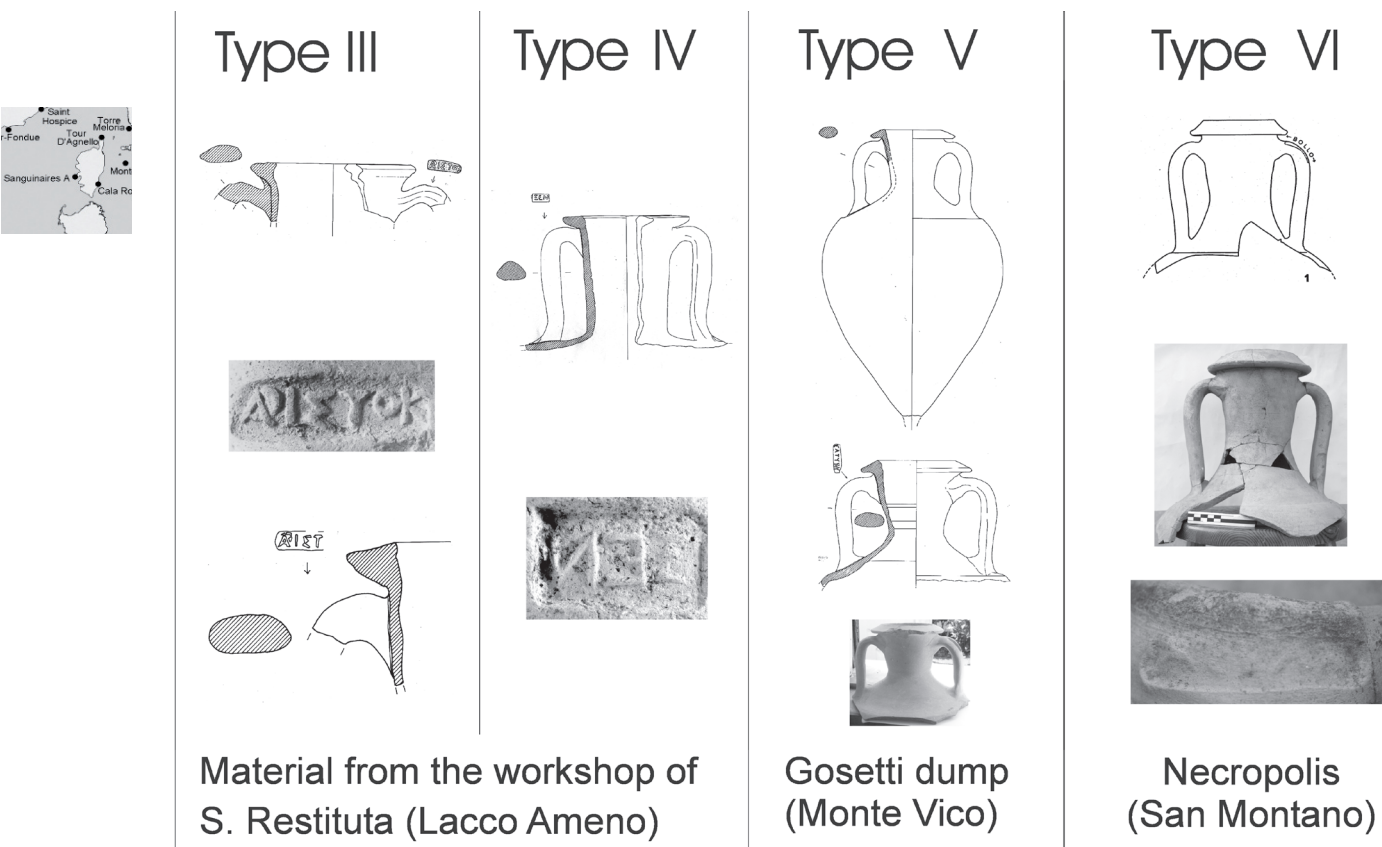


Fig. 2: Preliminary typology of the Greco-Italic amphorae from Ischia.

ric characteristic of Ischia, whilst others have a fabric slightly different, which has been documented in Naples.

The type V vessel has been found in diverse contexts within the western Mediterranean, as well as in several shipwrecks of the 3rd cent. BC, such as those of Secca di Capistello (Isole Eolie), the Tour Fondue (southern France), the Meloria, near Livorno (the last two dated towards the middle of the century) as well as the shipwrecks of Cabrera 2 and that of Bon Capò (Spain), although with some morphological differences. The laboratory analyses of these fabrics, to verify an eventual common origin, have so far been

undertaken on the amphorae of Secca di Capistello, Tour Fondue and Bon Capò³⁸.

4.1 The diffusion of Campanian pottery and amphorae in the southern Tyrrhenian area and western Mediterranean

Amphorae from Ischia and the Bay of Naples (dated between the end of the 4th and the first half of the 3rd cent. BC) have been identified on a few sites in Sicily and the western Mediterranean, due to their typology, fabric and stamps.

In order to confirm the hypothesized origin, laboratory analysis has been carried out, or is in the course of being conducted,

on amphorae from shipwrecks or consumption sites of which the origin is uncertain. In some instances the analysis has not been necessary, considering the macroscopic characteristics of the fabric and the unmistakable production technique of the amphorae of Ischia.

In the earlier phase, circulation was probably along the route to Sicily and, possibly, to Northern Africa, through Capo Lilibeo. The Punic centres, or places with a Punic influence (Erice, Lilibeo, Selinunte, Gela, Kamarina), were the arrival and consumption points of the wine and other products contained in the amphorae from the bay, between the end of the 4th and the beginning of the 3rd cent. BC.

The presence of early imports from Campania in Sicily – for example at the necropolis of Lilibeo – is documented through the presence of archaic Campanian A pottery³⁹. This pottery, as well as a few Greco-Italic stamps have also been discovered in Carthage, between the end of the 4th and the 3rd cent. BC and are a testimony of the relationship between the Bay of Naples, Punic Sicily and northern Africa⁴⁰.

Below is a preliminary list, most probably incomplete, of the localities where several amphorae stamps have been recovered, and which have also been recorded at Ischia (and in Naples):

4.1.1 Sicily

- Gela (a well dated context between 339 and 282 BC, the date of the destruction of Gela by Phintias)⁴¹. The stamp ZQ was discovered, which is well documented in Ischia, Naples and on the Filicudi F. Also from Gela have been recorded the retrograde stamp XAPM from the Hellenistic houses (end of the 4th/beginning of the 3rd cent. BC), the stamp MAMAP (from Capo Soprano)⁴² and the stamp EYΞENOY⁴³. The stamp ME is the same as recorded on some

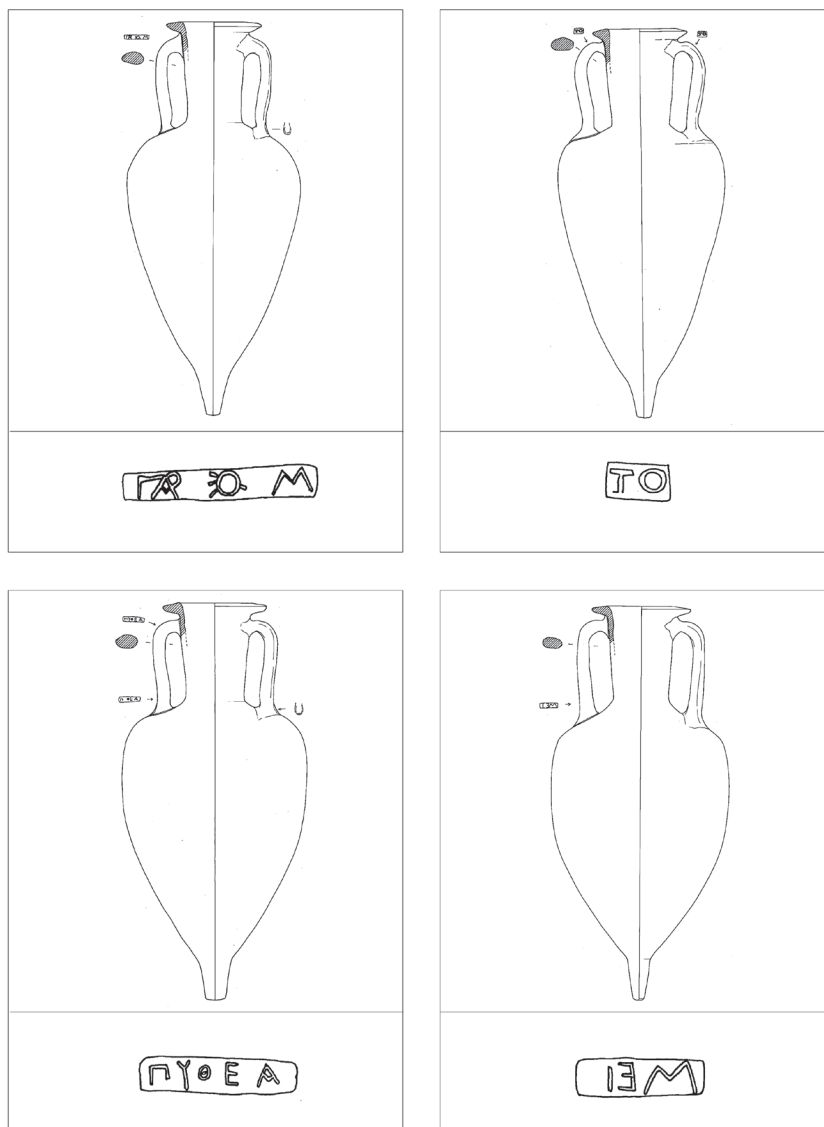


Fig. 3: The Filicudi F shipwreck: some Greco-Italic amphoras of type IV and their stamps.

amphorae from Naples.

- Manfria: the stamp XAPME has been attested here (in a context dated between the period of Timoleon and Agathocles, 310 BC)⁴⁴.
- Eraclea Minoa: the stamp ΖΩΙΑ has been recorded in the area of the theatre (4th/3rd cent. BC), together with the stamp XAPME⁴⁵.
- Selinunte: XAPME⁴⁶.
- Camarina: stoa (end of the 4th/beginning of the 3rd cent. BC): ΒΙΩ, ΔΙΟΝΥ, ΧΑΡΙΑΑ⁴⁷
- Poggio Marcato di Agnone: ME (type IV), ΖΩ.
- Caleacte: type V (stamp: ΑΝΔΡΩΝΟΣ and other greek stamps⁴⁸) recorded in the first third of the 3rd cent. BC.

4.1.2 Carthage

- Carthage (area of the port): XAPMEΩ⁴⁹.

From the text of Wolff (Wolff 1986) it can be deduced that ca. 500 Greco-Italic amphorae can be provenienced from the commercial area: *“Greco-italic amphora sherds were not found in the earliest layers of the Commercial Harbour; none was found in the earlier channel fill or in the 4th century metallurgical workshop area. They became more common in layers of the 3rd and 2nd centuries, and became especially numerous in the 146 BC destruction debris....The evidence of the Greco-Italic amphorae (as well as black glaze ware) points toward fairly vigorous commercial activity beginning in the late 4th and early 3rd centuries, diminishing considerably during the period from the beginning of the First Punic War to the end of the Second Punic War, and then expanding again after 200, until the beginning of the Third Punic War”*. And further on: *“My impression is that Greco-Italic amphorae are plentiful in Carthage, although there are few published examples”*.

It would therefore seem necessary to undertake a complete revision of the Greco-Italic amphorae from Carthage, taking into account also the epigraphic, macroscopic and archaeometric data to verify and

quantify the actual presence of Campania material in this period (the few published photographs and the two Greek stamps reveal that some amphorae are in all probability from the Bay of Naples).

4.1.3 France

- Ensérune (ΑΝΤΑΛΛΑ, ΑΝΤΑ [retrograde], ΧΑΡ, ΝΥΜΦΙ). The type IV and V amphorae have also been recorded at the necropolis of Aleria⁵⁰ and at Ensérune⁵¹.

5. The Aeolian shipwrecks: Preliminary information regarding the current research

Through the endeavours of a recent research project, a revision is currently under way of the cargo of shipwrecks which transported pottery and Greco-Italic amphorae (and Dressel 1) originating from the central-southern Tyrrhenian area⁵². Several shipwrecks found in the waters off the Isole Eolie, at Lipari, carried onboard a cargo formed of the oldest Greco-Italic type amphorae. Two of these sites, the Filicudi F and the Secca di Capistello, are currently being restudied by the author⁵³.

The place of origin of these two ships, dated to between the end of the 4th and the beginning of the 3rd cent. BC, is currently the subject of discussion amongst scholars, and has been attributed to either Sicily or to Campania⁵⁴. The mineralogical analysis conducted as part of the new project has allowed the exclusion of Sicily as having been the point of origin for the amphorae of the two shipwrecks, whereas the hypothesis of Campania seems to be strengthened by the majority of the material (see below)⁵⁵.

The amphorae found on the two shipwrecks also differ amongst themselves; the stamps do not always correspond and the technique of stamping also varies. Furthermore, the black-gloss ware which also formed part of the cargo of both of the shipwrecks has diverse characteristics. Whilst

this class of material from Secca di Capistello has been associated by Blanck with the black-gloss ware from Ischia⁵⁶, the *kylikes* of the Filicudi F are distinctive, and have also been documented in tombs in Lipari as well as in Naples and in several other contexts from Magna Graecia (for example at Roccagloriosa, in a tomb of the end of the 4th cent. BC)⁵⁷. The differences seen in this material could be caused by the fact that they came from different workshops, or by a possible chronological difference between the two shipwrecks.

5.1 The amphorae of the Filicudi F shipwreck

The vessel, which has been dated to between 300 BC and 280/250 BC, sank in the area of the island of Filicudi⁵⁸. The cargo, partially published⁵⁹, was principally formed of Greco-Italic type IV amphorae, stamped in Greek and with distinctive characteristics (see for example the long tapered body, cylindrical neck and particular rim section)⁶⁰ (**fig. 3**).

Several of the stamps found in the Filicudi F have also been documented at Gela, which was destroyed in 282 BC⁶¹. Also recovered were several black-gloss ware *skyphoi*, with a calcareous fabric and a part of the body left unglazed, of an unknown origin. Types very similar to these have been documented in tombs in Lipari, other centres in Sicily and at Roccagloriosa⁶².

5.1.1 The stamps

The stamps on the Greco-Italic amphorae of the shipwreck, written in Greek, are often two and were made both at the base of the handle in a rectangular frame and on the bend of the handle (**fig. 3**). The stamps are neat and well-made.

A larger number of the recovered amphorae – 16 in total – had the stamp ΓΑΡ (or ΠΑΡ), a crown symbol and an M. This stamp has also been documented at Ischia on



few fragments of handles; in some cases it has been made accurately, whilst in others more coarsely. A large number of identical amphorae with the same stamp have been recovered in Naples⁶³, in the recent excavation of the Underground (together with a bronze coin of Naples dated to 326 BC). The same stamp also appears to be present at Selinunte⁶⁴ and possibly at Monte Sant'Angelo (Licata)⁶⁵.

The stamp unifies a symbol (the crown), positioned between a name shortened to a monogram

(ΓΑΡ or ΠΑΡ) and a letter, the M⁶⁶. It has not yet been possible to unravel the stamp and understand whether it relates to two people or whether it is a name and a patronymic, or whether it is the abbreviation of a place name. The M could possibly represent the abbreviation of the stamp – ΜΕΓ – made on Greco-Italic amphorae that formed a part of the same cargo, however this is only a hypothesis.

The stylised crown made on the stamp is very similar, amongst

other things, to that which appeared later on the table of the victors of the Agones in Naples, the *Sebasta* festival, established in 2 BC in honour of Augustus. These games were possibly celebrated in substitution of an ancient festival, for example the one associated to the figure of Diotimus⁶⁷, during the period of the Athenian domination, the *feste lampadiche*, when a votive torch was carried during the race⁶⁸. If the symbol does correspond to a crown, the amphorae could therefore be associated with this festival. On the basis of what is known from Greece, where the Panathenaic amphorae, full of oil from the sacred olives, were awarded to the winners of the athletic games and the horse races⁶⁹, it may be hypothesized that the type IV amphora with its content (probably wine) was awarded as a prize to local agones. This does not, however, exclude the likelihood that these vessels, together with their content, could also be an object of trade.

In Athens, it was the city itself which ordered the amphorae from the workshops and entrusted the archons with their production; if the situation in the Bay of Naples was analogous, the stamps on the amphorae could conserve the memory of this activity and the people – magistrates or craftsmen – who were involved.

Fourteen type IV amphorae were however stamped ΠΥΘΕΑ, in clear, neat characters, similar to the previous stamp. This stamp does not seem to have been documented elsewhere, with the exception of Ischia where a single, truncated example ΠΥΘ has been recorded. The name is known in southern Italy at Dicearchia/Puteoli, Taranto and Selinunte, although in differing periods to that of the shipwreck in question⁷⁰.

The stamp ΜΕΓ has been identified on eight amphorae, all of the type IV; it has also been found on several examples from Naples and, possibly, in Sicily where it is recorded as the stamp ΜΕΓ⁷¹. At

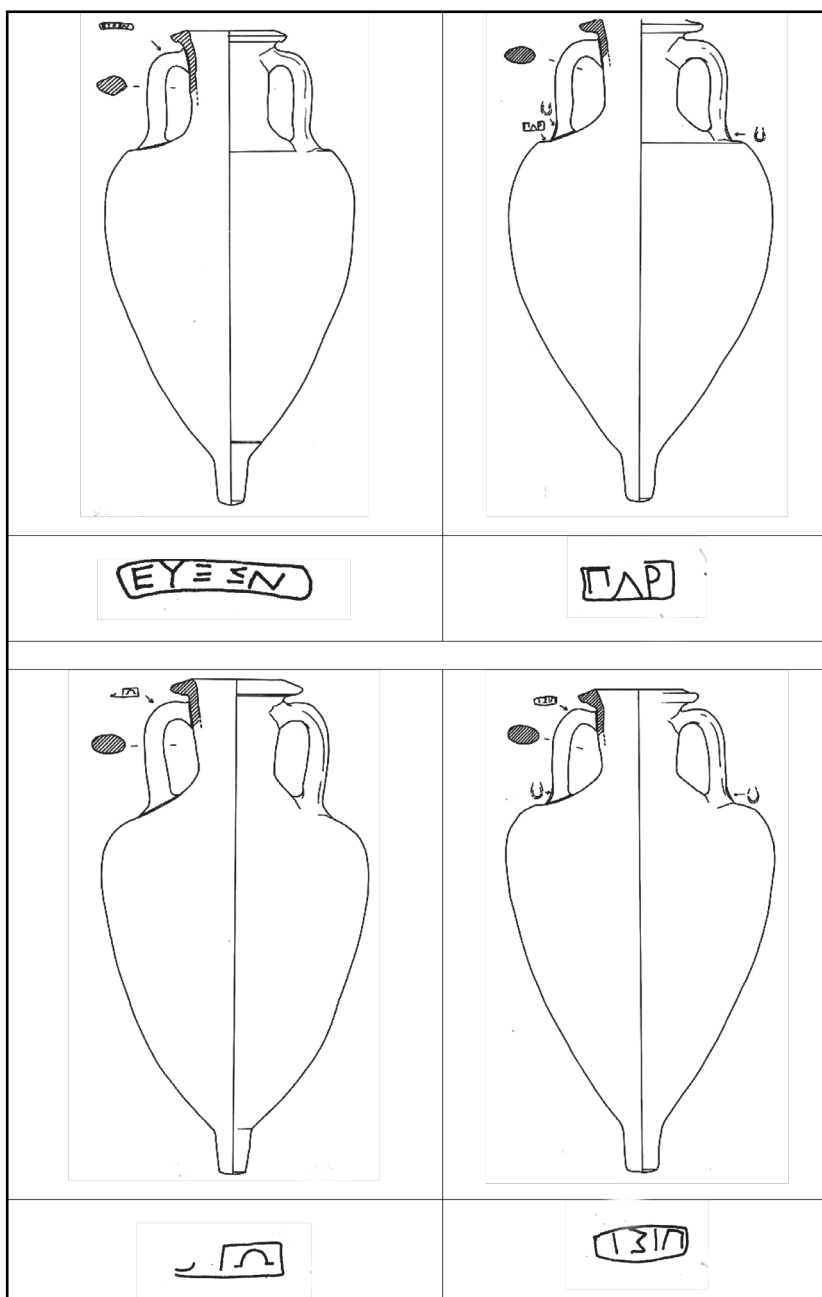


Fig. 4: The Secca di Capistello shipwreck: some Greco-Italic amphorae of type V and their stamps.



Ischia, the name ΜΕΓΑΚΛΗΣ has been recorded, in a dedication on the base of a Hellenistic votive offering⁷², found close to the district of the potter's workshops of Santa Restituta. The dedication, in Greek, is to Aristeos⁷³ on the behalf of Megakles, the Roman, son of Lucius. The name Megakles, as has been noted by Buchner who studied the votive offering in the 1950s, also appears in a Neapolitan inscription (I.G. XIV 777) as well as in another, in Capri⁷⁴. Without wanting to enter into a detailed discussion of the interpretation of the dedication, it is interesting to note that the name Lucius, father of Megakles, cited in the dedication, appears on several bricks from Pitecusa⁷⁵.

The stamp ΖΩ has only been documented on one type IV amphora. However this has provided important information, as the stamps ΖΩ, amongst the most numerous in Ischia, abbreviated from the name ΖΩΙΑ(ΟΣ)⁷⁶, are always stamped on the handle (it was not previously known with any certainty regarding the type of amphorae on which it was stamped).

The stamp has also been recorded in Naples; in Sicily it has been

discovered at Monte Sant'Angelo (Licata), Poggio Marcato di Agnone and at Gela, which was destroyed in 282 BC; if these are all instances of the same punch, the destruction of the city provides a *terminus ante quem* both for the stamp and for the type IV amphora.

One example of the stamp XAP(I) on a type IV amphora was identified. It can clearly be associated with examples from Pitecusa (XAP, XAPIA, XAPIAEO), and have also been recorded in Naples.

Finally, it should be noted that all the amphorae of the Filicudi F stamped with ΓΑΡ (or ΠΑΡ), a crown and an M, ΜΕΓ and ΠΥΘΕΑ (the last two with similar letters), XAP and ΖΩ belong to the same type IV amphorae and form a homogeneous cargo, which probably originated from the same area in which the amphorae were produced.

5.1.2 The laboratory analysis of the amphorae of the Filicudi F: preliminary results

The stamped amphorae of the Filicudi F shipwreck have been subject to mineralogical analysis.

The results are currently being processed by G. Montana from the University of Palermo. The data which was acquired has been compared with that of the amphorae of Naples and Ischia. The first results appear to favour a common origin for the amphorae of the three sites.

The mineralogical composition appears to again lead to Campania, possibly to the Bay of Naples. However, it should be highlighted that the fabrics of several amphorae of the shipwreck (those with the stamp ΓΑΡ/crown/M) are slightly different from those typical of the amphorae of the island; furthermore, a very low percentage of this particular stamp have been recorded at Pitecusa (whereas it is widespread in Naples).

Lastly, the recent discovery in Naples could allow the hypothesis that several of the amphorae of the Filicudi F were produced in the workshops of the city or in some other centre in the Bay. Further studies are currently being undertaken and it is probable that it will shortly be possible to identify a precise area of origin for these vessels.

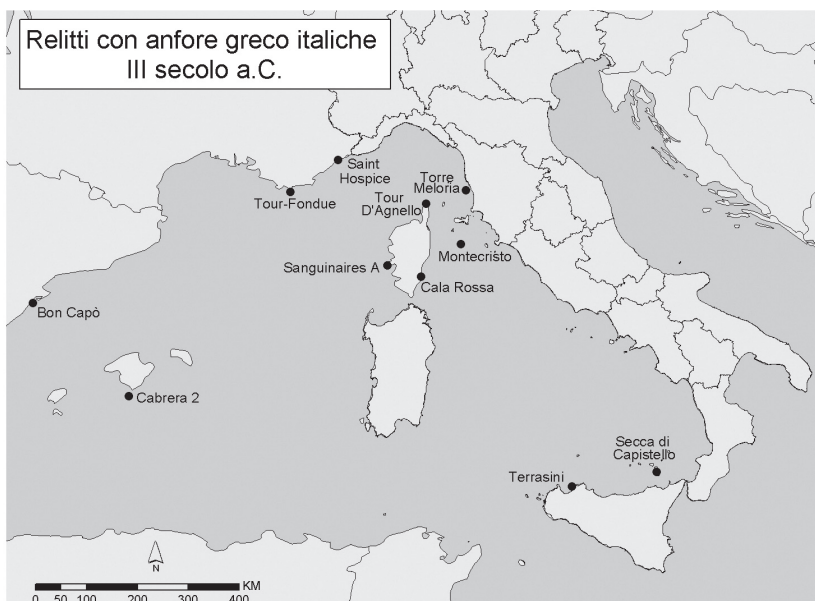


Fig. 5: Some 3rd cent. BC shipwrecks containing Greco-Italic amphorae.

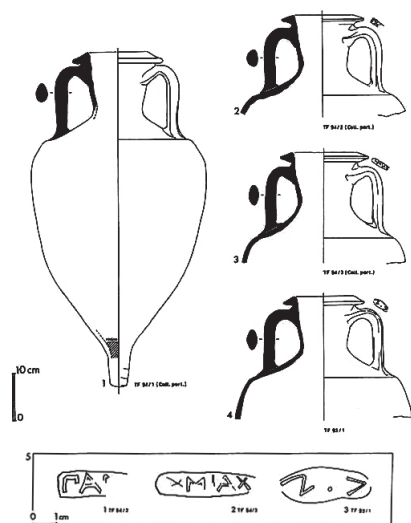


Fig. 6: The Tour Fondue shipwreck: Greco-Italic amphorae.

5.2 The Greco-Italic amphorae of the Secca di Capistello shipwreck

The cargo of the shipwreck, already published by H. Blanck amongst others, is currently being restudied⁷⁷, and includes Greco-Italic type V amphorae (fig. 4) and black-gloss ware. The shipwreck has been dated to between 300-280 BC. The amphorae, which in some cases contained olives, pistachios, grape-stones as well as some unidentifiable natural fibres, were stamped in Greek. Several of the published stamps have also been recorded at Gela, which was destroyed in 282 BC. The amphorae all have similar morphologies and fabrics, which are different however, also in the method in which they were stamped, to those of the Filicudi F.

C. Vandermersch, basing his hypothesis on the stamps, has attributed the amphorae to the Greek area of Sicily, whilst admitting the difficulty in identifying the cities in which they were produced⁷⁸. Several of these stamps⁷⁹ have also

been recorded at Ischia (a low percentage) and Naples with a fabric rich in volcanic inclusions.

The laboratory analysis conducted so far on the amphorae once again appears to exclude a Sicilian provenance, and instead favours one from Campania. The black-gloss ware is certainly Campanian in origin, which is very similar to that of Ischia/Bay of Naples and which has comparisons with finds from numerous sites in Punic Sicily and northern Africa (Carthage)⁸⁰.

One of the stamps that has been recorded on a type V amphora is EYΞEN(ΟΣ); this name, which is quite common, has also been found on stamps from Ischia⁸¹ and Naples. Other attestations on amphorae regard Sicily, and in particular Gela, destroyed in 282 BC, where a further stamp was found that is also common in Ischia, ΖΩ⁸². The name is known from several places within Sicily and at Metaponto⁸³.

A further stamp is ΠΙΟΠ, also known at Ischia where it was been

stamped on a brick (necropolis of San Montano, Tomb 48⁸⁴), as well as at Gela⁸⁵. The stamp ΠΙΣΤ was also recorded on the shipwreck of Secca; a single, but unclear, example of this has been found at Ischia, with the stamp ΠΙΣ⁸⁶.

6. Several shipwrecks in the western Mediterranean of the 3rd cent. BC with Greco-Italic amphorae

The current project aims to associate the amphorae of several shipwrecks of the 3rd, 2nd and 1st centuries BC with their respective areas of production. The research, which is based upon archaeological, epigraphic and archaeometric criteria, is undertaken in parallel with that of the study of the pottery production centres of Lazio and Campania⁸⁷.

The amphorae of the principal known production sites of Lazio and Campania (Torre Astura, Fondi, Formia, Minturno, Mondragone), as well as a few less known from inland Campania, are the subject of a new study, conducted

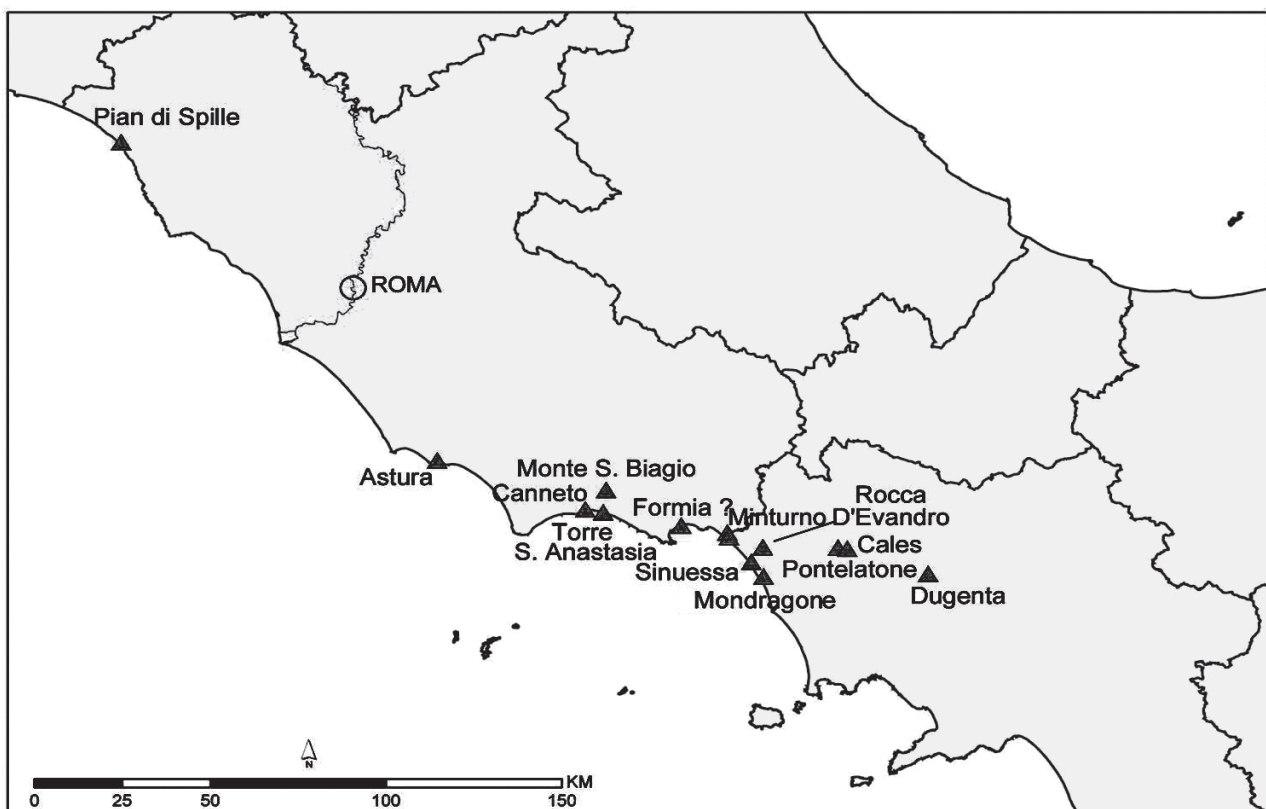


Fig. 7: Some places of production of late Greco-Italic and Dressel 1 amphorae in the middle-south Tyrrhenian region.

also in the laboratory, undertaken together with a field survey which aims recover traces of production activity.

In parallel to this, examinations will be made, also in the laboratory, of the amphorae from the shipwrecks. Several of these ships which were transporting Greco-Italic amphorae in the 3rd cent. BC⁸⁸ are shown on the map in **fig. 5**: these include the Montecristo⁸⁹, Torre della Meloria⁹⁰, Tour Fondue⁹¹, Bon Capò⁹², Cabrera²⁹³, Cala Rossa⁹⁴, Tour d'Agnello⁹⁵, Terrasini B⁹⁶, Saint Hospice⁹⁷ and the Sanguinaires A⁹⁸.

The amphorae which are the most often recorded are the types V and V/VI of Vanderersch's classification. It appears that it could be reasonable to associate several of the cargos with different areas of Campania (in particular with the Bay of Naples) and possibly also with Lazio, however, further verification, already conducted or currently being undertaken of the amphorae of the several shipwrecks, is necessary.

As an example, following are examined the cargo of two shipwrecks, that of the Tour Fondue and that of the Torre della Meloria.

6.1 Tour Fondue

The vessel sunk near to Marseille probably around the middle of the 3rd cent. BC – based upon the discovery of a black-gloss bowl of the Bats F 263 form type. It was transporting Marseille amphorae late 4 and 5 types, as well as Greco-Italic amphorae types V and V/VI, stamped in Greek⁹⁹ (**fig. 6**). The hypothesis of the scholars who have studied the shipwreck is that this was a vessel of modest dimensions, used for the redistribution of goods along the coast of Marseille¹⁰⁰.

Two of the stamps found in this cargo appear to be those also known at Ischia and Naples (ΠΑ or ΓΑ, ΧΑΡΜ, ΤΡΕ). The mineralogical

analysis of an amphora from the cargo of this shipwreck has shown that there are numerous similarities between its composition with that of the amphorae produced at Ischia or on the Bay of Naples¹⁰¹.

6.2 Torre della Meloria

The vessel, which was probably en route to either southern Gaul or the port of Pisa, sank near to Torre della Meloria (Livorno). It has been dated to between 240-230 BC, and was transporting Greco-Italic type V and V/VI amphorae, stamped in Greek, as well as black-gloss ware (principally Lamboglia 27- Morel 2783-2784 bowls) and Lamboglia 42 B *kylikes*, with horizontal handles¹⁰². The black-gloss ware has strong similarities in the form and decoration with a group discovered at Ischia, which probably originated from Naples¹⁰³.

The amphorae stamps described in the publication can be recognised as three different punches:

- ΣΙΜΙΑ written inside a rectangular frame, at the base and on the bend of the handle,
- ΣΙΜΙ in a rectangular frame at the base of the handle, with a further illegible stamp, which appears at the base of the other handle and starts with the letters MA,
- ΣΙΜ in an oval frame on the bend of the handle.

One amphora also has the letters ΔΙ painted in red¹⁰⁴. This mark, which consists of two letters and is probably an abbreviated name, also exists as a stamp and as graffiti on Greco-Italic amphorae from Ischia and Naples.

The amphorae have been associated by the authors of the excavation with the area of Lazio-Campania¹⁰⁵. The new evidence from Naples possibly allows this area of origin to be restricted even further.

The slave name ΣΙΜΙΑΣ – ΣΙΜΙΑ is probably the genitive – is very common in the Greek world¹⁰⁶. However, the discovery of a punch with the stamp ΣΙΜΙΑ in the exca-

vations of the Underground in Naples, in a context of the first half of the 2nd cent. BC, has recently permitted S. Febbraro to advance the hypothesis that the amphorae of the shipwreck of Torre della Meloria with this stamp originated from a workshop in Naples¹⁰⁷. Stamps associated with this name, but made by different punches (ΣΙ and ΣΙΜ, in an oval frame), have been found, in the truncated form, at Ischia in the dump of Gosetti¹⁰⁸.

Unfortunately it has not yet been possible to directly compare the fabrics, even through laboratory analysis, which could definitively confirm the association with the amphorae of this shipwreck with the Bay of Naples.

7. The latest Greco-Italic amphorae (types V/VI and VI) of the Bay of Naples

The latest phase of the production of Greco-Italic amphorae was in the 2nd cent. BC, in particular the types V/VI and VI, and can be dated through the recent and numerous finds from Naples¹⁰⁹.

At Ischia, amongst the material from the kilns of S. Restituta, the percentage of these types is seemingly quite low. The vessels have been found above all in the Gosetti property and at the necropolis of San Montano (**fig. 2**).

Amongst the stamps made on these amphorae, several have been well documented: ΑΣΚΛΗ¹¹⁰ is known from the finds from Naples, as well as from a number of diverse sites in the western Mediterranean; furthermore, the stamp ΦΙΛΙΠΠΟΥ on a type VI amphora is conserved at the Museum of Villa Arbusto at Ischia¹¹¹. The fabric of these last two, seemingly slightly different from that of the earliest production from Ischia, but which contain volcanic material, could originate from the Bay of Naples, even if only a laboratory analysis, already underway, can provide a definitive answer.



Differently from the period comprised between the second half of the 4th and the beginning of the 3rd cent. BC, in which it seems (although caution is necessary) that the production centres, above all those which commercially produced amphorae with a wide-spread distribution, were not many and were concentrated in the area of the Bay, in the 2nd century the production fragmented, and included different areas of the Tyrrhenian coast (for example Lazio, but also Etruria), an indication of a changed economic situation. There were also numerous production centres which also made Dressel 1 amphorae: Torre Astura, Fondi, Formia (?) Minturno as well as some others, concentrated in southern Lazio and Campania (fig. 7)¹¹².

The distribution of Greco-Italic amphorae is now much wider and includes an increasing number of shipwrecks, amongst which, for example, the Filicudi A, which has amphorae whose characteristics of the fabric can probably be traced to Campania (although it is still unclear from which area).

Notes

¹ Will 1982; Tchernia 1986; Manacorda 1986; Empereur – Hesnard 1987; Hesnard et al. 1989; Vandermersch 1994, 2001; Olcese 2004.

The fundamental work of C. Vandermersch, which since 1994 has drawn the attention of scholars studying amphorae (MGS III – VI) and the possibilities of their origins, has posed the problem of the production and circulation of wine in the 4th and 3rd centuries BC in the central southern area of the Tyrrhenian. These ideas have been continued and integrated into an article in 2001 in which the author maintains that together with the production of Magna Graecia and Sicily, existed further parallel productions which are defined as Romaines Médiorepublicaines (= RMR).

² The data has emerged from a recent survey in the various storerooms of the Soprintendenza Archeologica di Napoli e Caserta in southern Lazio and Campania, and refers to a necropolis of the period

between the middle/end of the 4th and the beginning of the 3rd cent. BC.

³ For simplicity, the numbering system established by Vandermersch will be used, omitting however the code MGS (Magna Graecia and Sicily) which, in the light of new research, describe too much the origin of the amphorae.

⁴ Hesnard et al. 1989; Arthur 1991.

⁵ Vandermersch 1994, 145.

⁶ It is maintained here that the study of Greco-Italic amphorae should be undertaken by area of production, instead of aiming to create a general typology of the vessels, valid for all of the areas; such a typology helps little in defining the diverse productions of Republican Italy. The studies conducted on the possible production areas are fundamental or where archaeological research has allowed the identification of workshops.

⁷ For Corsica, see the material from the necropolis of Aleria, Jehasse 1973. For Sicily, see for example the finds from the necropolis of Lilibeo, Bechtold 1999, 93. For northern Africa, the phenomenon emerged from the study of the black-gloss ware from Carthage, Chelbi 1992.

⁸ Even Morel, in his synthesis of maritime trade in the Hellenistic-Roman period, gives limited weight to the trade network prior to the Second Punic War, J. P. Morel, *Les trafics maritimes de la Grand Grèce à l'époque hellénistico-romaine*, in: F. Prontera (ed.), *La Magna Grecia e il mare*, Studi di storia marittima (1996) 145-173, in particular pages 147-150.

⁹ The research is conducted within the framework of a project financed by the Ministry for Italian Research (FIRB: Fondi Italiani Ricerca di Base) which aims to study the principal areas of the production of pottery in central southern Tyrrhenian Italy and their circulation, with the objective being a better reconstruction of the economy and trade in antiquity. www.immensaequora.org.

¹⁰ Lepore 1952.

¹¹ Frederiksen 1984, 225.

¹² De Caro – Giampaola 2004; De Caro 2005, 658.

¹³ Mele A. in: *Neapolis 1985*, 360-361.

¹⁴ Strabo V, IV.9.

¹⁵ Monti 1980; 1991. Lacco Ameno corresponds to the ancient Pithekoussai (ital: Pitecusa). The necropolis of San Montano, investigated by Buchner is located nearby, in the bay of San Montano.

¹⁶ Olcese et al. 1996; Olcese – Hiener 1999; Heilmeyer 2001; Olcese 2004.

¹⁷ Buchner 1994.

¹⁸ The study, which will be published in the volume currently in preparation, was conducted by M. Martini and E. Sibilia of the Department of Physics of the University of Milan Bicocca.

¹⁹ For the stamps of Ischia, see Buchner 1997; Olcese 2004.

²⁰ Olcese 2004.

²¹ De Caro – Giampaola 2004; Giampaola 2005; Febbraro – Olcese 2005.

²² De Caro 2005, 661; Giampaola 2005. This building, according to the excavators, was replaced in the 2nd cent. BC by a colonnade, which in the Roman period held the list of the victors of the Sebastà.

²³ There still exists the problem of the supply of clay to the workshops of Naples. Whilst those on Ischia could make use of the numerous outcrops of good quality clay, Naples, as far as we know, was not in possession of any sedimentary clay outcrops of the sort used in the production of amphorae. Buchner maintains that the clay used in the workshops of Naples was brought from Ischia (Buchner – Rittman 1948, 45). In fact, the recent discoveries in Naples, combined with those already obtained at Cuma, suggest the presence of a clay used by local workshops or, possibly, a mixture of clays (for further discussion of this argument, see Olcese et al. 1996, 25 note 62).

²⁴ There have been large numbers of publications on Pithekoussai; in this article, reference is made to the principal publication, Buchner – Ridgway 1993.

²⁵ A joint work is currently being undertaken in order to build a better interpretation from the data available.



²⁶ For this reason, a series of tests are currently being undertaken in the laboratory, considering that the pottery from the bay has distinctive composition characteristics.

²⁷ Ricq de Bouard – Meille et al. 1989, 257. T. Mannoni, for example, has for some time highlighted that in the area between southern Tuscany and northern Campania there are many areas of quaternary volcanic origins and the clay is characterised by the presence of the same minerals (augite, idiomorphic sanidine, biotite, glassy lapilli, fragments of trachytic rocks). However, the following research seems to provide interesting suggestions for a better characterisation and identification of pottery of some areas (Thierrin – Michael 1992). Undoubtedly, in the absence of any information on production centres, it is only the cross-correlation of different data – historical, typological, epigraphical and archaeometrical – that allows the definition of the zone of origin of the amphorae that have been exported.

²⁸ For further information about the project, coordinated by the author and in which participates various research bodies and scholars, see the preliminary internet site www.immensaequora.org.

²⁹ See note 6.

³⁰ In the volume, currently being prepared for publication, have contributed, for the archeometric section, Valerie Thirion Merle, M. Picon (for the chemical section) and G. Montana who substituted G. Thierrin Michael (who analysed the initial sections) for the mineralogical section.

³¹ The site is currently the focus of work by a team directed by E. Gailledrat: Gailledrat 2002, with previous publications.

³² The cluster chart or dendrogram (tree diagram), undertaken on a sample of 17 chemical elements, allows the identification of the groups of objects from their analogous composition.

³³ Thierrin in: Olcese et al. 1996.

³⁴ The amphorae from Naples are currently being studied, together with the rest of the contexts, by S. Febbraro and L.

Pugliese, coordinated by D. Giampaola of the Soprintendenza Archeologica di Napoli e Caserta.

³⁵ In some examples the amphorae appear to be to a passage type between the 3rd and 4th centuries BC.

³⁶ The large type is clearly identifiable due to the finds from the Filicudi F.

³⁷ The amphorae are currently being studied by Lydia Pugliese.

³⁸ The analysis of the amphorae from Bon Capò, the results of which are currently being processed, has been possible due to the collaboration of D. Asensio, those of the Tour Fondue due to Bernard Dangréaux.

³⁹ Bechtold 1999, 93 ff.

⁴⁰ For the black-gloss ware of Carthage, see Chelbi 1992.

⁴¹ Orlandini 1956, 352, fig. 11, n. 2; 1958, 361, fig. 5.

⁴² Adamesteanu – Orlandini 1956, 348, n. 3.

⁴³ Adamesteanu – Orlandini 1956, 361, fig. 5.

⁴⁴ Adamesteanu 1958.

⁴⁵ De Miro 1958, 281, fig. 50, n. 13.

⁴⁶ Salinas 1984, 328, n. 142.

⁴⁷ From a survey made in the storeroom of the Museum of Licata.

⁴⁸ Lindhagen 2006, 53 and the following pages. The author informs that Greco-Italic amphorae of Campanian origin are attested in Morgantina and Termini Imerese.

⁴⁹ Wolff 1986, 148, fig. 9.

⁵⁰ Jehasse 1973, table 143 no. 357 (type V), 1261 and 1355 (type IV).

⁵¹ Material displayed in the Museum of Ensérune.

⁵² www.immensaequora.org.

⁵³ The Roghi shipwreck also belongs

to this first phase, but the amphorae recovered were much fewer. The cargo of this ship is now being reviewed thanks to the kind permission of R. Gullo, Director of the Museum of Lipari.

⁵⁴ Vanderersch 1994, 74-75 suggests Sicily and/or Magna Graecia, also on the basis of the names on the stamps and the dialect characteristics.

⁵⁵ The reading of the sections was conducted by G. Montana.

⁵⁶ Blanck 1978, 108.

⁵⁷ Gualtieri – Fracchia 1990, 258, fig. 183, n. 76.

⁵⁸ Lamboglia – Pallarés 1983; Bernabò Brea – Cavalier in: AA.VV. 1985; Parker 1992. The date has been proposed on the basis of the black-gloss ware, Morel 1981, 62; Vanderersch 1994, 74 agrees with this late date.

⁵⁹ Cavalier – Livadie in: AA.VV. 1985, 89-91. On the basis of a recent verification conducted at Lipari, there are 54 amphorae on display.

⁶⁰ All the amphorae are Greco-Italic, with one exception which is Punic.

⁶¹ From the data currently being processed by the group from Naples, we know that amphorae very similar to that of the Filicudi F with the same stamp have been recorded in Naples, together with coins of 326 BC.

⁶² Gualtieri – Fracchia 1990, fig. 179 nn. 75 and 76, approximately dated to the period between the second half of the 4th cent. and 300-280 BC.

⁶³ The stamp in question on the examples from Naples is being studied by L. Pugliese.

⁶⁴ See Livadie in: AA.VV. 1985, 91, read as PAOM.

⁶⁵ It is a rectangular frame in which the first letters are erased, apart from the final M, typical of this sort of stamp (from a comparison made directly at the Museum of Licata). Barra Bagnasco 1989, table XXXVII, n. 24.

⁶⁶ On the basis of the examples from



Ischia, it is not clear if the first letter is a P or a Γ, but the examples from the shipwreck appear to confirm the hypothesis that this is a Γ and not a P, as previously proposed by Vanderersch 1994, 174. The other example is the stamp XAPMEO, followed by kantharos/small amphora.

⁶⁷ Beloch 1890, 57.

⁶⁸ Statius, *Silv.* III 5, 80 and IV 8, 45-54; Velleius I, 4.

⁶⁹ Valavanis 1986.

⁷⁰ Fraser – Matthews 1997, 380.

⁷¹ In Sicily, at the Museum of Licata from Poggio Marcato di Agnone, on a MGS III amphora, is the stamp ME in ligature; however, this could have nothing to do with the stamp from the shipwreck.

⁷² Buchner 1951, 4 and the following pages.

⁷³ Aristaeus was the god of the flocks and the bees which lived amongst the Eubea Mountains and protected the trees and the olives.

⁷⁴ Buchner 1951, 9, n. 1. In fact Fraser – Matthews 1997, III A, 290 record the presence of this name also at Locri, in Lucania and in Sicily.

⁷⁵ Buchner 1951, 10, note 1.

⁷⁶ At Ischia, the stamps ZOIA are also recorded.

⁷⁷ Frey et al. 1978; Blanck 1978: Livadie – Cavalier – Vanderersch in: AA.VV. 1985, 53 and the following pages; Parker 1992, 396.

⁷⁸ Vanderersch 1985, 64.

⁷⁹ Vanderersch 1985. The list of the stamps from the shipwreck, with their respective analyses, will be published in the work currently being prepared for publication.

⁸⁰ Bechtold 1999, 93.

⁸¹ Amongst the finds from the dump on the Gosetti property, preserved in the storeroom of Mezzavia at Lacco Ameno, Ischia.

⁸² Adamesteanu – Orlandini 1956, 361, fig. 5.

⁸³ Fraser – Matthews 1997, 171.

⁸⁴ Buchner – Ridgway 1993, table 45 tomb n. 48, Hellenistic.

⁸⁵ Adamesteanu – Orlandini 1956, 352, fig. 11.1, with an I at the end.

⁸⁶ From the dump of Gosetti.

⁸⁷ For details about the current project, see the preliminary website www.immensaequora.org.

⁸⁸ The volume of Parker 1992 is an important source for a first identification of the shipwrecks, several of which are now the subject of investigation.

⁸⁹ Parker 1992, 281; Corsi 1998.

⁹⁰ Bargagliotti – Cibecchini 1997; Bargagliotti – Cibecchini – Gambogi 1997; Cibecchini 2002.

⁹¹ Joncheray 1989; Dangréaux 1993-1995, 1996.

⁹² Asensio – Martin 1998.

⁹³ Parker 1992, 80, together with earlier publications; Ramon 1994, 27 (amphorae dated to the end of the 3rd cent. BC).

⁹⁴ Parker 1992, 90, together with earlier publications; Bernard – Cibecchini 2003.

⁹⁵ Alfonsi – Gandolfo 1987.

⁹⁶ Parker 1992, 422 together with earlier publications.

⁹⁷ Pomey et al. 1992.

⁹⁸ Alfonsi – Gandolfo 1997.

⁹⁹ Joncheray 1989; Dangréaux 1993-1995, 1996.

¹⁰⁰ Long 1990.

¹⁰¹ The analysis of the thin section was conducted by G. Montana; the complete dataset will be published in the volume currently in preparation.

¹⁰² Bargagliotti – Cibecchini 1997; Bargagliotti – Cibecchini – Gambogi 1997.

¹⁰³ The comparison has been based upon published material, as so far it has not been possible to conduct a direct comparison.

¹⁰⁴ Bargagliotti – Cibecchini 1998, fig. 3.4, ΔI, probably incorrectly indicated as ΔA in the text on page 168.

¹⁰⁵ Cibecchini 2002, on the basis of the mineralogical analysis conducted by T. Mannoni and C. Capelli, Genova.

¹⁰⁶ Fraser – Matthews 1997, III A, 395.

¹⁰⁷ Febbraro, S., in a paper at the “Congresso di Lattes, Itinéraires des vins romains en Gaule”, January 2007.

¹⁰⁸ This is unpublished material. A similar oval frame is documented amongst the amphorae of Marseille, Bertucchi 1992, fig. 80, 24/73, read as PY, but possibly legible as ΣIM.

¹⁰⁹ Currently being studied by Stefania Febbraro.

¹¹⁰ On a type VI amphora, from tomb 124 from the necropolis of San Montano.

¹¹¹ Tomb 31 of the necropolis of San Montano.

¹¹² Hesnard et al. 1989; Arthur 1991.

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Sources of figures

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