

The Roman Settlement of Poggio del Molino: the Late Republican Fort and the Early Imperial Farm

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The Roman Settlement of Poggio del Molino, located in the territory controlled by the city of Populonia (Piombino, Livorno), has long drawn the interest of archaeologists. Excavations conducted by the University of Florence were interrupted for twenty years and eventually resumed in 2008. The new research project has provided evidence for the site's architectural evolution, revealing different construction stages and uses of spaces during a time of intense environmental and political change. Such data confirm the strategic importance of Poggio del Molino throughout a very long period of Roman history, from the Late Republic to the end of the Empire— mid 2nd century BCE—beginning of 5th century CE. The new research project is endorsed and supported by public institutions (Municipality of Piombino and University of Florence) as well as private national and international institutions (Cultural Association Past in Progress, Earthwatch Institute, University of Arizona, Hofstra University, Union College, Foundation RavennAntica) which are involved in field surveys, post-excavation studies and initiatives concerning the site's enhancement. This paper focuses on the oldest stage of the site's history, the Late Republican Fort, and on the second stage, the farm with fish sauce production.

1 - The Late Republican Fort of Poggio del Molino. Preliminary data

«Una posizione paesaggistica così felice costituisce un pregio non secondario per una villa marittima, ma la scelta della località può avere obbedito anche ad altre motivazioni, più direttamente legate alla morfologia di questo tratto di costa e alle attività lavorative che in antico vi si svolgevano» (SALADINO 1995, p. 33).

Indeed, the Roman villa of Poggio del Molino was built on a strip of land far from the city, the port and the main roads (fig. 1). This strategic vocation (with different purposes at different times) has made Poggio del Molino a multilayered site, continuously inhabited from the Late Republican times to the beginning of the Middle Ages (fig. 2).

Before being turned into a maritime villa, the complex was used in the Augustan age as a farm, with an area for the production of fish sauce¹; the farm, in turn, was built on top of a late Republican structure displaying the features of a defensive building. Apparently, then, the choice of the location was motivated in the first place by strategic reasons aimed to the defense and the political and military control of the territory.

Poggio del Molino is a thin promontory extending between the beach of Rimigliano on the north side, and the Gulf of Baratti on the south. The settlement, located 22 m a.s.l. on the northern slope of the hill, overlooks westward the stretch of sea between San Vincenzo and the Island of Elba, eastward the Colline Metallifere and the plain of Campiglia, ancient site of the Rimigliano lake. A strategic position, therefore, to control the access to the channel that led from the sea to the lake² and its small harbor³.

¹ GENOVESI, MEGALE 2013: 901-908.

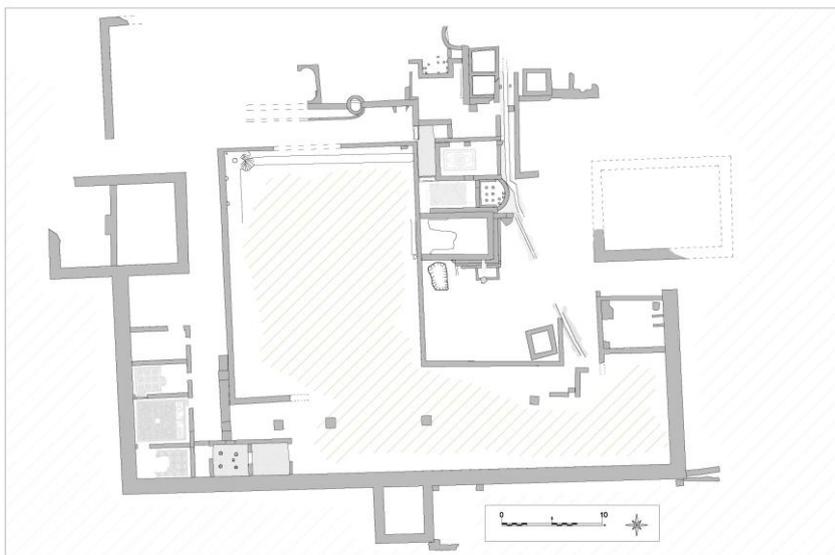
² On the geomorphological characteristics of the lake, MAZZANTI, NENCINI, UGHI 1992; for the archival sources and historical maps, CARDARELLI 1963, SALADINO 1995; ISOLA 2006; BAGNOLI 2009.

³ DALLAI 2004.



Fig. 1. Localization of the settlement of Poggio del Molino.

Fig. 2. Complete map of the site (E. Mariotti).



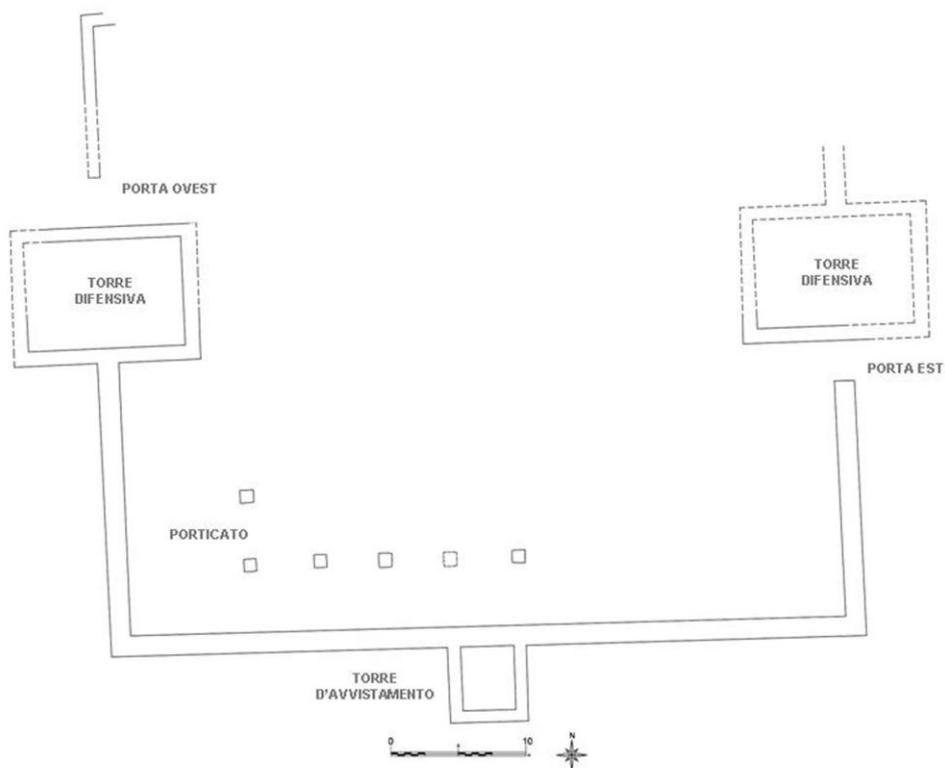


Fig. 3. Map of the Late Republican fort (C. Baione).

The Fort (phrourion)

The quadrangular fort, probably built in the second half of the 2nd century BCE, was defined by a thick perimeter wall whose northern portion collapsed into the sea (fig. 3). The only fully preserved section of the wall is its southern side, measuring about 55.65 m, or 188 feet. Despite the lack of comparable evidence, this measure can possibly correspond to the numerical indication (P CLXXXVIII) inscribed on a block of limestone found in secondary deposition⁴ with another similar block that reveals the inscription *p(edes) 191* (P CXCI), equivalent to 56.54 m. Both blocks are now preserved in the Archaeological Museum of Populonia in Piombino (fig. 4). Therefore, if the two blocks truly record the linear measurements of the north-south and east-west sides of the perimeter wall - that is 188 x 191 Roman feet equivalent to 55.65 x 56.54 meters - the area of the fort will be about 3,145 square meters.

The perimeter wall consists of an inner core of limestone rags tied with tough mortar, and of two wall surfaces made with rough-hewn limestone blocks of medium and large size, which are also attached with mortar. The corners are made of perfectly squared blocks of white rhyolite and local sandstone (*panchina*) in alternation, laid in courses of headers and stretchers (fig. 5). All the preserved sides of the wall are between 1.50 and 1.30 m thick.



Fig. 4. Limestone blocks with inscriptions.

⁴ DE TOMMASO *et al.* 2010a: 355, fig. 16; DE TOMMASO, GHIZZANI MARCÌA, MEGALE 2010b: 169-173.

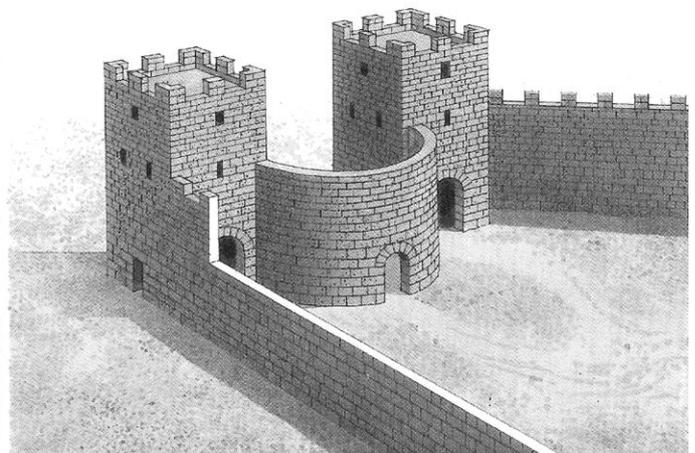
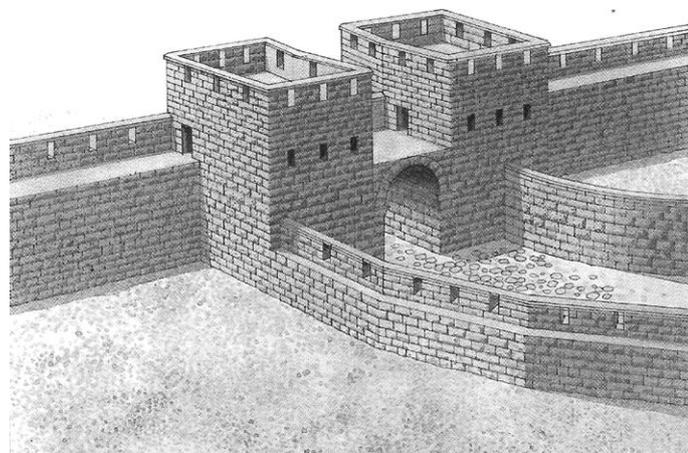
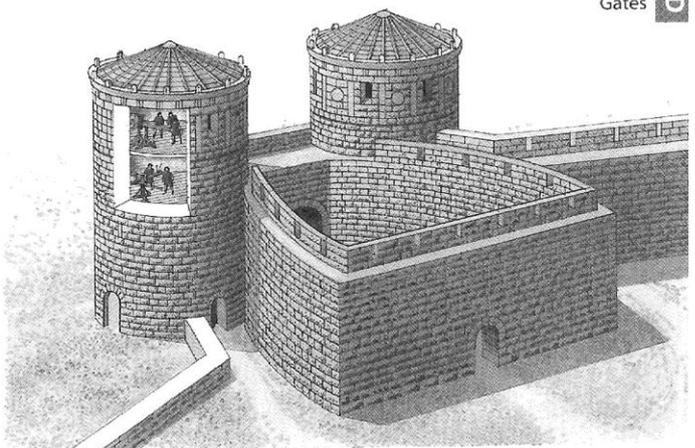
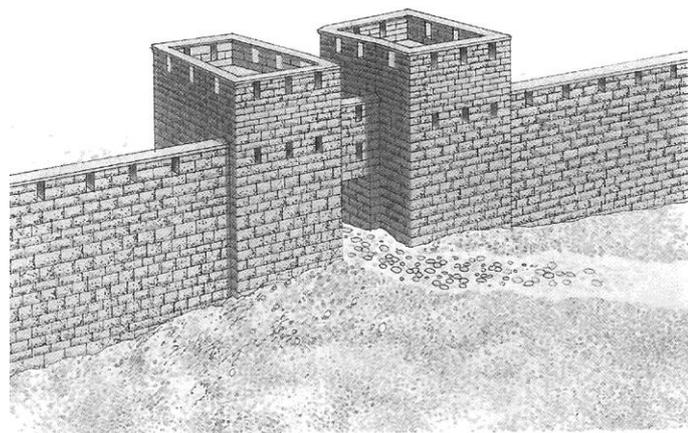


Fig. 5. Southwest corner of the perimeter wall.

Fig. 6. East Gate of Priene, viewed from the outside and inside; above right the Main Gate of Perge; below right the Main Gate of Sillyon (Nossov, 2009: 26D).

Access to the fort was provided by two wide gates of approximately 3 m (about 10 Roman feet) each, respectively located along the east and west sides of the wall and both flanked on the right by a defensive tower, rectangular in plan⁵. Potential assailants would thus approach the gates exposing their right flank, unprotected by their shields, to the attacks of the archers stationed on the tower's roof⁶. Similar gates, sometimes flanked by towers on either side (fig. 6), are documented for instance in the strongholds of Hellenistic Greece⁷.

Along the south side of the perimeter wall, slightly off to the west and stretching outward, opens a quadrangular room of about 5.60 x 5 m identifiable with a watch tower, that at this phase presents no access from the ground floor.



⁵ DE TOMMASO *et al.* 2011: 313-318.

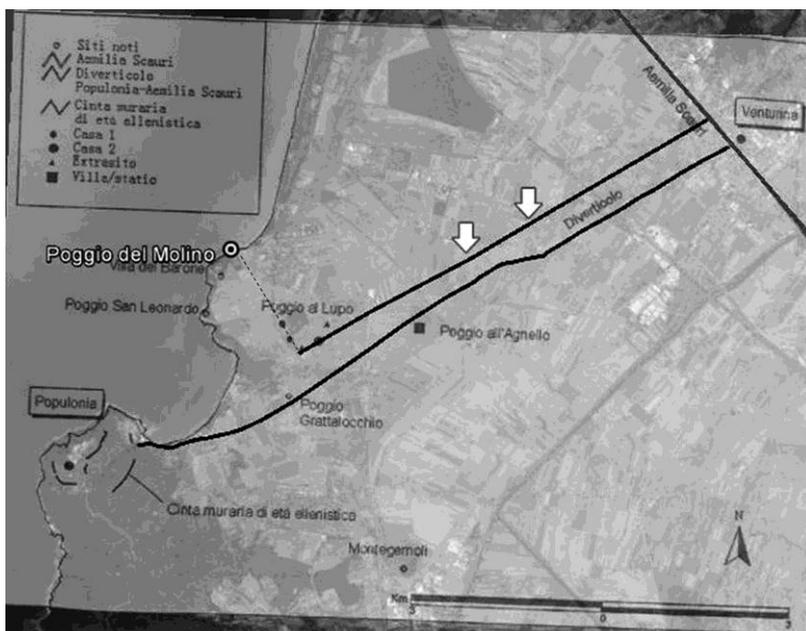
⁶ NOSOV 2009: 24-29.

⁷ GARLAN 1974; ADAM 1982; MCNICOLL 1997; lastly NOSOV 2009 with bibliography.

Fig. 7. Indication of the mark related to the road identified on aerial photos taken in 1944 from RAF (photo Aerofototeca Nazionale).



Fig. 8. Overlay satellite image (Google Earth) and map with reconstruction of the road (diverticulum) hypothesized by Botarelli and Dallai (BOTARELLI, DALLAI, 2003: 238, 4). Indication of the road emerged from the reading of aerial photo and the perpendicular stretch directed toward the settlement of Poggio del Molino.



The tower controlled a portion of territory south of Poggio del Molino probably crossed by a road that from the via Aurelia reached Populonia and the fort. It has been hypothesized⁸ that such road started in Caldana, near the present-day settlement of Venturina, and after passing by Poggio all'Agnello and Poggio al Lupo rejoined the coast road at Poggio Grattalocchio, where Antonio Minto documented the presence of a paved road never again identified⁹.

The preliminary study of aerial photography has highlighted an anomaly in which we might recognize the trace of the hypothesized road (fig. 7)¹⁰: as a matter of fact, it runs parallel and close to the track marked by Botarelli and Dallai. Extending the track westward, we see that it coincides exactly with the current S.P. of Caldanelle as far as the junction with the S.P. of Principessa. Perhaps it is not unlikely to suppose the existence of a perpendicular street that from that junction led straight to the settlement of Poggio del Molino (fig. 8).

The inner organization of the fort is at the moment difficult to grasp, because the walls and floors built in the later phases (farm and villa) cover large portions of the fort, making further excavations impossible. In the south-west sector we hypothesize the existence of a portico (above fig. 3), suggested by six rectangular bases of about 0.90 m per side, made of limestone blocks of small and medium size attached with mortar.

The evidence associated with the fort layer dates to the half of 2nd century BCE: findings include black glazed ware, thin walled pottery and a silver coin of *Calpurnius Piso* depicting the laureate head of Apollo on the obverse and a galloping horseman on the reverse (fig. 9). Reading the coin's legend is more troubling than interpreting its depictions, because only the *cognomen* *Piso* is certain, while neither the *praenomen* nor the end of the inscription are perfectly readable. Therefore, the doubt between *Lucius Calpurnius Piso Frugi*, moneyer in 90 BCE, and his son *Caius Calpurnius Piso Frugi*, who held the same office in 67 BCE, cannot be ascertained.

Strabo

Scholarly works on Roman Populonia often cite the words used by Strabo to describe the Gulf of Baratti – first the view of the coast from the sea, then the land on the way up to the hill town. The geographer describes the almost deserted city, a few scattered dwellings, the better peopled harbor, and then comments: “*in my opinion this is the only one of the ancient Tyrrhenian cities that was situated on the sea itself; and my reason is the country's lack*

⁸ BOTARELLI, DALLAI 2003: 238-239.

⁹ MINTO 1943: 339.

¹⁰ I thank for the help Giorgio Pocobelli.



Fig. 9. Silver coin of Calpurnius Piso.

of harbors – precisely the reason why the founders would avoid the sea altogether, or else would throw forward defenses towards the sea, so as not to be exposed, a ready prey, to any who might sail against them¹¹”.

As suggested by Jane Shepherd, the scattered dwellings (κατοικίαι) must be identified with the uphill settlements that Strabo sees approaching the Gulf from the sea, such as Poggio San Leonardo and Poggio del Molino¹².

At this point Strabo adds a detail that I think is worth pointing out: the fact that the Etruscans founded their cities far from the sea (with the only exception of Populonia), while on the coast they only built ἐρύματα, defensive structures whose purpose was that of controlling the sea and fighting off potential attacks.

The Greek term ἐρύμα means defense, safeguard, refuge, protection; fortress, stronghold, trench. In Strabo’s *Geography* it occurs twenty-six times (the first one actually referred to Populonia), with three different meanings. 1) Fortification, in the general sense of building designed for military defense. 2) Stronghold, as in fortified place with a defensive utility, either of large dimensions such as a citadel, or of smaller dimensions such as a fortress, a fort, a garrison. 3) Natural defense – accompanied by the adjective φυσικὸν – but in this meaning it occurs only once.

The choice of the term in each context seems to be unrelated to either the location (unlike, for instance, the latin *arx*, a stronghold located on the northern spur of a hill so as to tower over a city or a territory) or the function (unlike, for instance, the Roman *castra* whose defensive use was exclusively military).

Previous studies¹³ have shown how Strabo’s description of the Etruscan coast was the result of the geographer’s own journey to that land. It is not unlikely, therefore, that his short digression on Etruscan strongholds could have been inspired by the observation of some structure that reminded him of that local aspect.

Now, at the time of Strabo’s journey the stronghold of Poggio del Molino had no longer a defensive function, since it had been turned into a farmhouse with adjoining *cetaria*, a factory for the production of fish sauces equipped with salting vats.

Nevertheless, the general appearance of the complex, especially if observed from the sea, must have been that of a (former) fortified structure. Stratigraphic data¹⁴ indeed reveal that the strong perimetral wall, as well as the defensive watch towers (although with a different function and interior design) exhibit a continuous occupation up to the time of the site’s abandonment, dating between the end of the 5th and the beginning of the 6th century.

Accordingly, while putting into the harbor of the only Etruscan city founded on the sea, Strabo may have seen the abandoned city, a few scattered dwellings on the hills around the bay, and an old fortified structure – the one on Poggio del Molino – that reminded him of the Etruscan habit of building strongholds along the coast in order to fight off attacks from the sea.

¹¹ Geogr. V, 2.6. Eng. translation by H.L. Jones, Loeb Classical Library 1961.

¹² SHEPHERD 1999: 119-122.

¹³ PASQUINUCCI 1988: 48-49; SHEPHERD 1999: 119.

¹⁴ DE TOMMASO *et al.* 2011: 313-318.

The enemy

What would have been the reasons for the construction of a fort here?

Between the 2nd and the first half of the 1st century BCE, pirates were the scourge of the Tyrrhenian coast and of the entire Mediterranean Sea¹⁵. Literary sources on the subject are plentiful and unambiguous.

Around 74 BCE the pirates attacked *Brundisium* (Brindisi) and the coast of Etruria (Appian, *Mithr.*, 93); in 70 BCE the *praetor Caecilius Metellus* successfully fought against the pirates who were ravaging Sicily and Campania after pillaging and burning ships in Ostia and other cities of Italy (Livy, *Periochae*, 98.3; Floro, I, 41.6; Cassius Dio, XXXVI, 22).

Eventually, in 67, the tribune of the plebs *Aulus Gabinus* brought forward the law (*lex Gabinia*) that granted Pompey command of the war against the pirates in the Mediterranean (*bellum piraticum*). In forty days of spring and summer 67 BCE, Pompey freed the West from the pirates, then he headed to Cilicia where they had withdrawn and in three months he vanquished them, forcing them to surrender.

Investigating the phenomenon of piracy through material remains or archaeological records is a more challenging task. Piero Gianfrotta and Luca Cavazzuti's studies¹⁶ have assembled archaeological evidence of wrecks associated with pirate activity. Very briefly, their analysis is focused on wrecks of commercial vessels with onboard weapons (helmets, swords, spears and breastplates) of uncertain function. The weapons aboard merchant vessels would be indicative of the presence (also mentioned in written sources) of armed men – either seamen or an actual armed escort – ready to provide protection against external attacks. Archaeology would therefore provide evidence of precautionary measures aboard commercial vessels against the threat of pirate attacks.

Another issue that has been addressed is the difficulty of identifying the cause of a shipwreck. Causes of the wrecking of a ship can relate to the weather conditions or the stranding of the vessel on shoal or rocks. But a ship can also sink because of an attack, be it in a naval battle or in a clash against pirates.

An external attack is the assumed cause of the sinking of the ship of Spargi, a commercial vessel carrying a cargo largely composed of wine and oil amphorae, black-glazed pottery and objects in marble and bronze. Among the finds recovered from the wreck was a helmet preserving traces of a skull, an indication of the fact that when the ship sank, at the beginning of the 1st century BCE, armed men were on board. Traces of a violent impact on the hull planking cannot be explained with the underwater topography of the seafloor surrounding the wreck, which does not show surfacing rocks or other natural obstacles. Finally, the fact that while the ship was sinking the man was armed and wearing a 2 kg helmet suggests that a fight was underway, otherwise he would have taken off the helmet to move more freely¹⁷.

The presence of fortresses, forts, strongholds, defensive buildings and watchtowers along the coast may be a well-founded archaeological indication of the perception of piracy as a real threat. Unfortunately, at least as long as the Tyrrhenian coast is concerned, there are no methodical studies on the matter.

Frank Edward Brown¹⁸, for instance, relates the widespread destruction of the better part of the city of Cosa with the pirate raids along the coasts of Italy. As a matter of fact, the defensive structures of the town – a tower, galleries and ramparts – were built or refurbished in a rush just at that time.

It is hoped that this line of research will inspire new investigations of the presence of pirates along the Tyrrhenian coast based on further archaeological evidence.

2 - A cetaria in Poggio del Molino. New evidence for fish processing in the territory of Populonia

The fish-sauce factory

Very likely, the settlement of Poggio del Molino developed during the half of the 2nd and first half of 1st century BCE as a stronghold for the Northern end of the Populonia coast. The historical context was that of a considerable political instability¹⁹. Following the end of the civil wars between Marius and Sulla and the end of the threat of piracy, the defensive building in Populonia was gradually turned into a factory for the processing of fish (fig. 10, 1-3). The latter was apparently located in the North-eastern sector of the dig, where the 2010 and 2011 excavations brought to light a structure to be identified as a *cetaria*.

According to our present knowledge, the factory consisted of five salting vats (1-5; figs. 10-12) four of which have a square plan (measuring 2.18 m on each side and at least 1.2 m deep). They are lined in pairs across from a fifth rectangular vat of bigger size and depth (2.18 x 3.5 m; depth 1,45 cm). All the vats of the complex are built with

¹⁵ On ancient piracy, SESTIER 1880; ORMEROD 1924; GARLAN 1978; IENTILE 1983; BRACCESI 2004.

¹⁶ GIANFROTTA 1981 and 2001; CAVAZZUTI 1997.

¹⁷ GIANFROTTA 1981: 229-233.

¹⁸ BROWN 1970-71.

¹⁹ DE TOMMASO, GENOVESI, MEGALE, 2011; GENOVESI, MEGALE 2013.

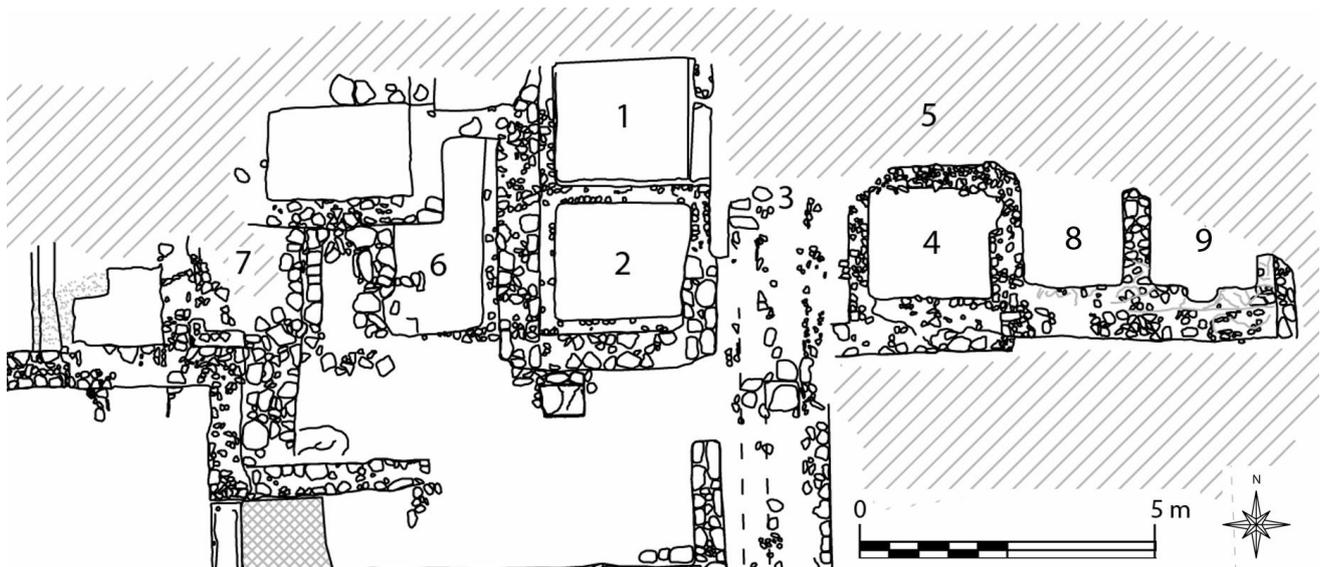


Fig. 10. Map of the Northern sector of the settlement of Poggio del Molino: the fish-sauces workshop (vats 1-9). Second half of the 1st cent. BCE.

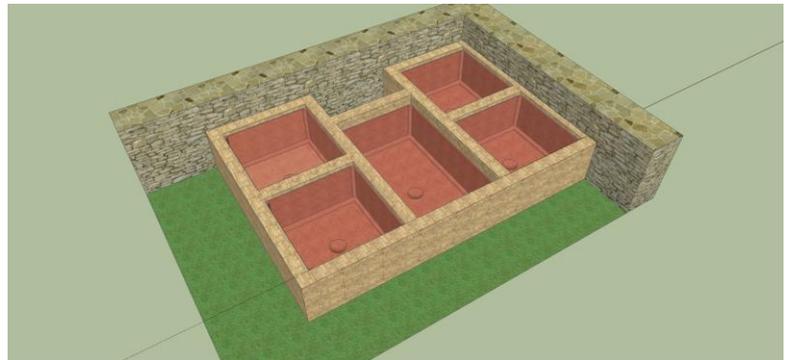


Fig. 11. Fish sauces workshop vats 1-2; in the foreground the wall enclosing vats 1-5.

Fig. 12. 3D reconstruction of the original plan (vats 1-5) of Poggio del Molino fish sauces workshop.

the same technique: their walls are 30 cm wide and they are made of small blocks of calcarenite rock (informally known as “*panchina*”) bound together by mortar. The inner sides of the walls are coated with a layer of *cocciopesto* about 2.5 cm thick; both the horizontal and vertical corners are provided with quarter-round mouldings. A circular depression of 40 cm in diameter

is located at the center of the floor of each vat.

Along the south and west ends of the complex runs a 80 cm thick wall made of large blocks of sandstone (so-called “*macigno*”). The only corner presently known shows *panchina* voussoirs.

Two more vats (6-7²⁰; about 5 x 8 m) – only partially investigated – are located west of the perimeter wall (fig. 13). Their building technique is the same as that of the bigger group of vats, indicating that they were built during the same phase, but the different features of the *cocciopesto* inner coating and the location outside the wall suggest a different use of the outer tanks – perhaps for storing water and/or salt.

²⁰ Two more vats (8-9) have been discovered but not yet dug in the Easternmost sector of the area in 2015.



Fig. 13. View of vat 6, located north of vats nos. 1-5. On the right part of the waterproof plaster floor of the vats is visible.



Fig. 14. Section of the archaeological stratification identified in vat 2.

The complex can be identified as a factory for the processing of fish-based products (*cetaria*). Structural comparisons with similar constructions both in Italy and in the Roman provinces confirm this interpretation, ruling out analogies with structures for the production of wine and oil. Crucial pieces of evidence are the shape, number and placement of the vats, as well as the presence of the perimeter wall, very common in the fish factories of the Western provinces²¹.

The vats in Poggio del Molino can be pertinently compared to the tanks of the *cetaria* no. 2 (mid 1st - early 3rd century CE) of the Lusitanian settlement of Troia, located at the estuary of the Sado river in Western Portugal²². Comparisons with the *cetaria* no. 1 of *Baelo Claudia*, to be dated between the late Julio-Claudian age and the middle of the 3rd century CE, are also relevant²³.

As for the Italian peninsula, the *cetaria* of Torre del Campese on the island of Giglio (2nd-3rd century CE) includes two square vats connected to a third pool of rectangular shape. All vats are coated with cocciopesto plaster and provided with quarter-round mouldings at the bases of the walls²⁴.

The settlement of Poggio del Molino is situated on a promontory about 22 m above sea level; such a location is quite unusual for a fish factory. *Cetariae* are generally found along the coastline, at low altitudes, in order to ease fishing and fish processing activities. Nevertheless, we have evidence of more than a few *salsamenta* factories and/or fish sauce production centers located at higher altitudes, such as the 2nd century CE *cetaria* of Ploumarc'h en Douarnenez, built on top of a hill along the Breton coast²⁵, and the *cetaria* of Tavira, in the area of the Lusitanian town of *Balsa*²⁶.

The vats in Poggio del Molino were intentionally filled up with several layers of clay, building materials of various kinds (stones, lumps of mortar and earthenware, fragments of mouldings, bricks and elements for *opus spicatum* flooring), pottery and a considerable amount of iron slag (fig. 14). The thorough excavation of vats nos. 1 and 2 – bottom levels especially – provides a *terminus ante quem* for the abandonment of the factory to the mid 2nd century CE.

Among the vat no. 1 latest dating items are fragments of late-Italic *terra sigillata* vessels (fig. 15, 5-7) referable to the *Conspectus* 3 dish and the *Conspectus* 45.2.1 cup, both of which were still popular during the mid 2nd century CE²⁷. Wine amphorae of Dressel 2-4 type and Iberian amphorae for the trading of *garum* sauce (fig. 15, 10-11) are also attested. The material found in the vats is definitely residual: there are fragments of black glazed pottery (fig. 15: 1-2), dating between the 3rd and the mid 1st century BCE (Morel cup 2655a.1, 2784d.1 and 2654a.1; Morel dish 2285a.1 and 2255f.1), lamps (so-called biconical Esquilino type), Graeco-Italic and Dressel 1 amphorae, common pottery and cooking ware of the mid and late Republican age, common to be found in the urban center and territory of Populonia (fig. 15, 3-4).

²¹ ÉTIENNE, MAYET 2002: 8-11.

²² PINTO, MAGALHÃES, BRUM 2010: 534, figg. 2, 6.

²³ ÉTIENNE, MAYET 2002: 87, 89, 93-94, fig. 20, A.

²⁴ RENDINI 2003: 176-179, figg. 2-5.

²⁵ EVEILLARD, BARDEL 2005.

²⁶ DE FIGUEIREDO 1906: 118-119, fig. 4.

²⁷ RIZZO 2003: 77, tab. 7b; 95, Tab. 12.

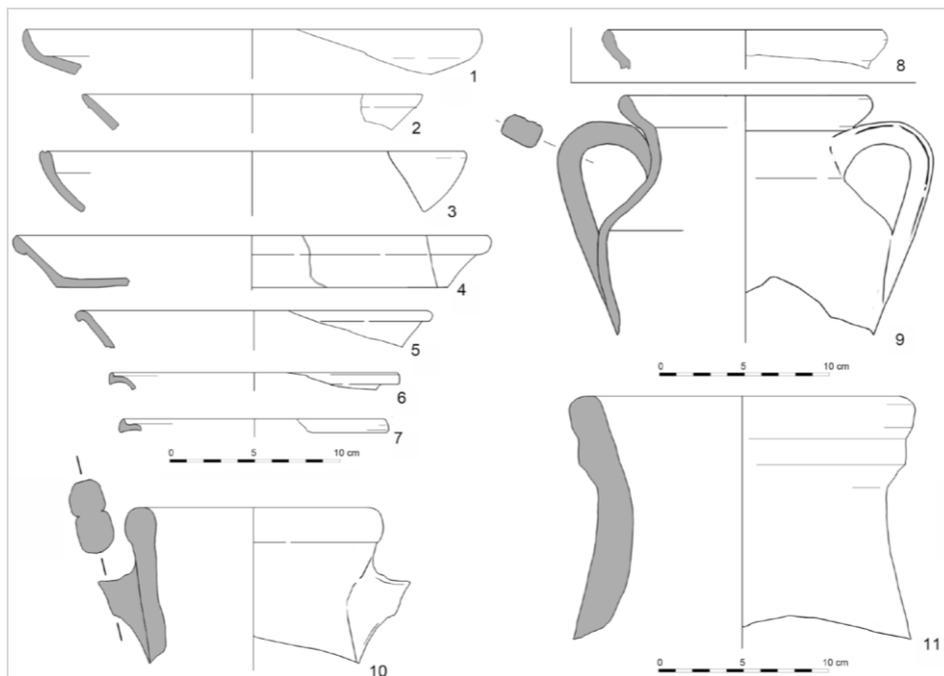


Fig. 15. Materials from the levels of abandonment of Poggio del Molino's cetaria (vat 1). Black-glazed pottery: 1. Morel dish 2285a.1 (end of 2nd-half of 1st century BCE); 2. Morel cup 2255f.1 (second half of 2nd century BCE). Cooking pottery: 3. Casserole (second half of 2nd century BCE – first half of 1st century CE); 4. Flat bottomed casserole (Ghizzani group 4, Fig. 1f; 2nd-1st century BCE). Italic terra sigillata: 5. Conspectus 3 dish (second quarter of 1st – half of 2nd century CE); 6-7. Conspectus 45.2.1 cup (Flavian age-middle of 2nd century CE). Small jars: 8 (Poggio del Molino 80's excavations) -9. Amphorae: 10. Dressel 2-4; 11. Garum amphora from Baetica (1st century CE).

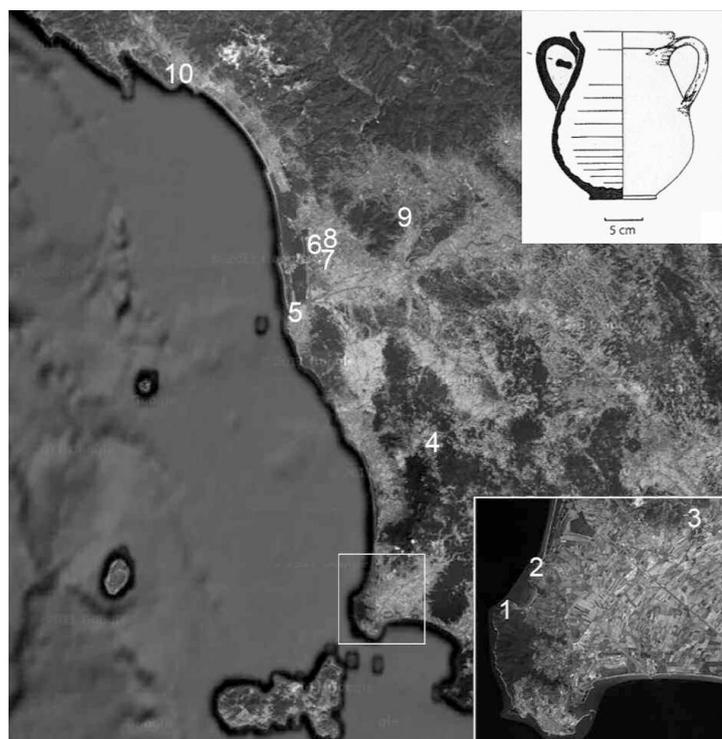


Fig. 16. Distribution of small flat bottomed jars of type Gasperetti 1213 (1st century BCE-IIIrd century CE), in the northern coastal Etruria. 1. Acropolis of Populonia; 2. Poggio del Molino; 3. Villa of Cafaggio; 4. Monte Bono; 5. Santo Stefano ai Lupi Portus Pisanus; 6. Pisa - San Rossore; 7. Pisa - Giardino dell'Arcivescovato; 8. Pisa - Stadio.

The date of the Poggio del Molino fish factory's construction is, instead, difficult to determine, since the structure's foundations have not yet been excavated. The only possible hypothesis at the moment, considering the accurate building technique of the vats and the topographical plan of the *cetaria*, is that the complex must have been built when constructions of this kind were architecturally mature and standardized, that is between the mid 1st century BCE and the early Imperial period.

The cetaria of Poggio del Molino and the processing of fish in the economy of the ager Populoniensis: some preliminary considerations

Our knowledge of the processing of fish and fish-related activities along the Tyrrhenian coast and in the area of Populonia (fig. 16) is based on a famous passage in Strabo (*Geogr.*, V, 2, 6) mentioning a lookout for bluefin tuna at the summit of the cape which commands the gulf. As a matter of fact, tuna fishing along the coast of Populonia was carried out between the 15th and the middle of the 20th century, with the extensive lagoons of the area, including the Lake of Rimigliano, providing salt for the processing of fish. However, Strabo's written evidence and other indirect sources have never been supported by any archaeological data before the digging of Poggio del Molino. The only exception are the remains of a few alleged tuna traps in the stretch

of sea facing the Baratti shoreline, consisting of anchor stocks presumably anchored to the seabed in order to hold the nets²⁸.

Investigations and discoveries of the last few years confirm the existence of fishing and fish processing activities in the territory of Populonia, also attested by the well-known passage of Strabo (*Geogr.*, V, 2, 6). In addition to the tuna traps, there is evidence of *cetariae* on the Baratti beach²⁹, while the nearby lagoons were fundamental sources of salt for the production of *salsamenta*³⁰.

As for the salt production site, the Lake of Rimigliano - a vast lagoon with its main access point located just North of the villa – is a likely hypothesis³¹. Overall, it seems that the northern stretch of the Populonia coast was, at some still partially undefined point in history, an important site for the processing of fish.

The impact of fish-related activities in the general economy of Populonia is still a troublesome issue. There is evidence of fish-based products imported into Populonia from the nearby *ager Cosanus*³²; what was, then, the impact and the importance of the Poggio del Molino *cetaria* production, in terms of quantity and distribution?

The total capacity of the known vats can be currently estimated in at least 33.8 m³ ca, a value slightly lower than that of the individual factories in *Baelo Claudia* – medium capacity 40-50 m³ each³³ – but significantly higher than that of the small *cetariae* of *Sabratha*, whose capacities vary between 4 and 9,55 m³³⁴.

This datum is currently not so substantial, since the massive total production of *Baelo Claudia* and *Sabratha*'s many factories provides crucial evidence of extensive Western Mediterranean exports of fishery products.

Closely related to this issue is also the study of the trade containers employed in Poggio del Molino. Recent investigations have pointed out the many solutions (*urcei* and amphorae of different sizes) adopted in the Italic area for the trade of fish-based products. Some of these containers are known to have been employed also in the *ager Populoniensis*, but the topic has never been the subject of a comprehensive study.

An important starting point for future researches on the matter is the attestation in Poggio del Molino of a globular amphora with everted rim³⁵, referable to a group of small vessels (capacity 1-4 liters) with an egg-shaped body, two short bowed handles from the shoulder to the neck and flat bottom. These vessels, especially common in Campania, were used for the local trading of fish-based products and other semi-liquid goods, such as honey³⁶. Substantial pieces of evidence are the specimens of these vessels found in Pompeii, still preserving organic materials such as fish bones and resins. The use of small globular amphorae with everted rim for the trade of fishery products finds further confirmation in the evidence found at the Breton *cetariae* of Ploumarc'h en Douarnenez³⁷. There, such vessels show the presence of an organic compound similar to the Roman fish-sauce *altec*.

Since the clay composition of the amphora found in Poggio del Molino – dating between the early imperial age and the beginning of the 3rd century CE – cannot be related to the pottery productions of Campania and Lazio, we can hypothesize the existence of a different *atelier*, whose location is at the moment impossible to determine.

During the 2010 excavation campaign, a second fragment of a small globular amphora was found in one of the levels filling the outer vats of Poggio del Molino (fig. 15, 9). The residual material filling up the vats features black-glazed 'Esquiline' biconical lamps, *sigillata italica* and amphorae of Dressel 2-4 types; due to the presence of such material, the abandonment of the vats can be loosely dated between the early imperial age and the end of the 1st century CE, a chronology partially overlapping the usual dating of the globular amphorae – early 1st to mid 3rd century CE³⁸.

Two further pieces of evidence of globular amphora vessels come from other sites of the *ager Populoniensis* (fig. 16, 1 and 3). Field surveys in the villa of Cafaggio³⁹, active between the late 1st century BCE and the beginning of the 2nd CE (fig. 7, 3), have brought to light a small, cupped-rim amphora comparable to a specimen from Luni dating between the 2nd century BCE and the 1st century CE⁴⁰. A very well preserved small amphora of the same kind - convex rim, globular and double-handled body, flat bottom – was found on the acropolis of Populonia, in the area of the temples located between the two slopes of Poggio del Telegrafo and Poggio del Castello⁴¹.

Small jars of the same kind are attested, between the early Augustan age and the end of 2nd/beginning of 3rd century CE, along the Tyrrhenian coast between Campania and Liguria, particularly in Pompeii (certainly one of the

²⁸ SHEPHERD 2003; SHEPHERD, DALLAI 2003.

²⁹ CAMBI *et al.* 2007: 306, 311-312, fig. 3b.

³⁰ CARUSI 2008.

³¹ CARUSI 2008: 305.

³² DE GROSSI MAZZORIN 2006; PECCI 2006; COSTANTINI 2007. For the activity of *cetariae* of this area see also CAVALLO, CIAMPOLTRINI, SHEPHERD 1992.

³³ ÉTIENNE, MAYET 1995; ÉTIENNE, MAYET 2002: 95-96.

³⁴ WILSON 2007.

³⁵ DE TOMMASO 1998: 265, fig. 33, 7; fig. 6, 8.

³⁶ GASPERETTI 1996: 27-28, 31, fig. 2, 15-16, shapes 1213th-b.

³⁷ EVEILLARD, BARDEL 2005: 153, fig. 7.

³⁸ GASPERETTI 1996: 30, fig. 2, 15.

³⁹ BOTARELLI 2006: 499, fig. 6, n. 10.

⁴⁰ FROVA 1973: 421, Pl. 73, 25.

⁴¹ COPEDE 2006, p. 131, fig. 13e, with bibliography.



Fig. 17. Main fish sauces production areas along the Tyrrhenian coast. 1. Pompeii; 2. Ager Cosanus; 3. Ager Populoniensis.

jars showing the same morphological features of the one from Poggio del Molino have been found both in Cosa and in its territory⁵¹; along with amphorae, they could have been used for the transportation of Cosan fish-based products.

Hopefully, new and interesting data about the territory of Populonia will come out of the investigations conducted at the settlement of Vignale⁵², where an *atelier* with at least two kilns produced tiles and amphorae between the late Republican age and the early Imperial age has been identified. The Vignale production included a number of Dressel 1 amphorae; it would be very interesting to know if variant C was in the number and if it was also employed for the trading of *salsamenta*, as assumed by current theories⁵³.

The presence of these containers in Populonia and in the nearby territory – that needs in the first place to be reconsidered in the light of a careful analysis of the vessels' fabrics, can possibly become the starting point for the study of the trade of Populonian fish-based products. The main purpose of the present paper is to outline some of the main features of this broad issue, without any claim to be exhaustive and/or systematic. The chronology of this economic activity is still far from being fully understood and the small double-handled and flat bottomed jars we focused on are certainly not the only containers used in the trade of fishery products (see other amphorae types, smaller amphorae such the Schoene I and VI types, other types of jars).

Future researches and excavations at the *cetaria* in Poggio del Molino could, however, make a significant contribution to our knowledge of one of the major economic activities in the territory of Populonia, along with the manufacture of iron.

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⁴² LONG, PITON, DJAOUI 2009: 588, with bibliography.

⁴³ PASQUINUCCI *et al.* 2009-2010, fig. 8, 6.

⁴⁴ PICCHI 2007-2008: 65, fig. 7, 79.

⁴⁵ See GASPERETTI 1996: 30; LONG, PITON, DJAOUI 2009: 588; MACCARI 2007-2008: 83, fig. 4.34-35.

⁴⁶ GIANNONI 2005: 127- 128, pl. VI, BR2c, with bibliography.

⁴⁷ FROVA 1973: 421, pl. 73, 25.

⁴⁸ LONG, PITON, DJAOUI 2009: 586-589, figs. 16-17.

⁴⁹ CAVALLO, CIAMPOLTRINI, SHEPHERD 1992; MARZANO 2007: 302-303.

⁵⁰ BENQUET, MANCINO 2007; COSTANTINI 2007.

⁵¹ DYSON 1976: 80, fig. 16, V D87.

⁵² GIORGI, PATERA, ZANINI 2009.

⁵³ BENQUET, MANCINO 2007.

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