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Pottery at Molino San Vincenzo and its Context

Consumption Patterns in the Roman City of Empoli and in its Hinterland from the 6th Century BCE until the 6th Century CE

The paper focus on the relation between the rural site of Molino San Vincenzo and the urban center of Empoli in terms of production and consumption. Since pottery is an excellent tool for tracking indications of subsistence production and/or manufacturing for exchange two assemblages, that of Molino San Vincenzo and that of the Gioielleria Pratesi in Empoli are analysed. In a first step a short overview of the material culture found at both site is given. The following analysis of the pottery assemblages brings important results regarding settlement activity and the lifespan and function of the sites, as well as on their integration into the micro-level and long-distance trading network of the Arno valley and Tyrrhenian Sea area. By determining regional vessel forms, identifying the raw materials by archaeometrical analyses and studying wasters the production centres of pottery can be determined. Thus Empoli can be shown as well-integrated into the interregional trade network of the Roman Empire. The site of Molino San Vincenzo, on the other hand, concentrated on trading contacts at the local and regional level.

Keywords: pottery; pottery production; archaeometry; trade and trade networks; urban and rural production and consumption

1 Introduction

The hinterland of northern Tuscany has long been viewed as underdeveloped, unimportant and somehow lying at the back of beyond. But is this true and are peripheral sites or minor centres really at the back of beyond? To test this thesis, pottery findings from Empoli and its hinterland have been studied as an indicator of demand and product availability, and the results are briefly presented here.¹

¹ The results presented in this article are based on my dissertation for which I analysed the pottery assemblages of the three sites mentioned below: Schreck 2018. For a summary of the state of art regarding the middle Arno valley: *ibid*, 2–5. I would like to express my gratitude to Günther Schörner (University of Vienna) for the possibility to work in an international and interdisciplinary research project, and the Austrian Science Fund FWF for the funding of this project. Furthermore, I want to thank the Soprintendenza per i Beni Archeologici della Toscana, in the person of Lorella Alderighi, for the cooperation and the permission to study the findings presented here. Special thanks go to Leonardo and Elisabetta Terreni for their support and the interesting discussions.

As a fluviially-influenced landscape, the middle Arno valley fulfills the requirements for the weathering and deposition of clay raw materials. Therefore, a multitude of pottery production sites have been detected in the middle Arno valley in general so far, especially in the region of Empoli.² As pottery is an excellent indicator of economic exchange, the analysis of sherds can give insight into the mercantile connections of the sites. The aim of this study is to show the similarities and differences in pottery use in an urban center and at sites in its hinterland. Hence, an analysis and comparison of the pottery from three selected sites has been conducted by means of comparing shapes and fabrics. One of the sites is located in an urban context, the ancient city center of Empoli, while the other two lie in its hinterland in a more peripheral region.

For a better understanding of the infrastructural situation, the sites will be presented here with regard to their geographical location. Empoli lies on the left bank of the Arno river in a wide plain, which is characterized by fluvial sediments of the river itself. The medieval city center probably corresponds with the area of the Roman town.³ While the name of the ancient city is not known, it is assumed, that the name ‘in portu’ as mentioned on the Tabula Peutingeriana between Pisae on the Tyrrhenian Sea and Florentia in inland Etruria corresponds with Empoli, as there probably existed a harbor in ancient times.⁴ Therefore, the Arno river was, together with the via Quinctia, the main west-east connection from the Tyrrhenian Sea to inland northern Etruria. This illustrates the integration of Empoli in an infrastructural network, and the good connectivity from Empoli to the Tyrrhenian Sea and vice versa. The hinterland sites of Molino San Vincenzo and Podere Piano, on the other hand, are located in a river valley on the left bank of the torrente Pesa to the southeast of Empoli.

2 The sites

The site in the city center was discovered during reconstruction works of the so-called Gioielleria Pratesi in Empoli.⁵ The excavation was conducted between 1980 and 1982. The material found was filled in two large storage containers of uncertain dating. The filling was heavily mixed-up. Therefore, it was not possible to identify a stratigraphical sequence.⁶ Due to the findings, a dating of the site from the 6th century BCE until the Renaissance was possible. Especially several sherds of the pottery production of Montelupo, which began the production of glazed vessels – the so-called Maiolica di Montelupo – in the 13th century,⁷ are testimony to the repeated displacement of the findings.⁸

² Olcese 2011–2012, 27f.

³ See Maiuri 2006, fig. 3.

⁴ Maiuri 2006, 37. This indication is still mentioned on maps of the 16th and 17th century: Donati 2012, fig. 1–2.

⁵ In Italian: Scavo Pratesi. Therefore, the abbreviation SP is used in the figures.

⁶ Maiuri 2006, 29; Ferretti et al. 1995, fig. 21.

⁷ For an excellent overview of this type of pottery, see the homepage of the Museo della Ceramica di Montelupo: <https://www.museomontelupo.it/le-collezioni-del-museo-e-il-percorso/> (17.01.2019)

⁸ Ferretti et al. 1995, fig. 21.

The second pottery find complex comes from the site of Molino San Vincenzo⁹ in the Pesa valley, where an annual training excavation was conducted from 2011 to 2018.¹⁰ It is located on the periphery of Empoli. The site experienced several interferences of unknown dating and its identified structures are heavily damaged by modern agricultural activities. The installation of drainage trenches, as well as the deep ploughing in the 20th century, destroyed much of the structures. Most of the layers contained findings of modern dating. During the field campaigns, it soon became clear that the ancient building identified on-site was heavily damaged by the modern agricultural activities, and it was therefore not possible to reconstruct a detailed stratigraphy of single layers building on the oldest identifiable layer of Etruscan origin.¹¹

The third site, Podere Piano, was surveyed in 2015 and 2016, and merely 33 diagnostics have been found. Due to the small number of diagnostic finds, which result in a lacking comparability of pottery features, the focus of this article is placed on the findings from urban Empoli and the hinterland site of Molino San Vincenzo.

3 The findings

As stated above, the chronological classification of the pottery by means of stratigraphical sequencing was not feasible. Therefore, the dating of the finds was only possible by comparing the shapes of diagnostics. For this study, 593 fragments of the rural site and over 5300 diagnostics of the urban center were analyzed.

Molino San Vincenzo

Especially the site of Molino San Vincenzo held some interesting findings,¹² which provide valuable insights into the history of the site. The oldest item found is an arrowhead from the Neolithic period made of red chert. This material is typical for the region. As several artefacts made of the same rocks were found between Montecatini Terme and Bientina, this kind of relict was probably manufactured in the study region (fig. 1).¹³

Later findings indicate a continuous inhabitation of Molino San Vincenzo from the 7th or the 6th century BCE until the Late Antique period and even into the early Medieval period. Thanks to several rim and bottom fragments of large storage containers, so-called dolia, which were made of a very coarse fabric,¹⁴ a vivid agricultural production is attested for the period of the 6th to the 2nd century BCE. As these containers are of huge dimensions, their production

⁹ The abbreviation MSV is used in the figures.

¹⁰ The site was first studied in 2010: Alderighi 2011. The excavation of 2011 was conducted by the Friedrich-Alexander-Universität Erlangen-Nürnberg (G. Schörner and M. Boss). In 2012 a cooperation of the University of Vienna (G. Schörner) and the Friedrich-Alexander-Universität Erlangen-Nürnberg (M. Boss) was carried out. Since 2013 the annual training excavation was funded by the University of Vienna.

¹¹ Schreck 2018, 7–10.

¹² Only some fragments of the field-walking campaign of 2010 were analyzed, while the whole finding assembly of the years 2011–2016 was studied.

¹³ Products made of this material were clearly manufactured in the region as several relicts made of the same rocks were found in the area between Montecatini Terme and Bientina. See Rinaldi 2013, 39; for the dating: 42.

¹⁴ For the shapes: Schreck 2018, pl. 154–156.



*Fig. 1 Arrowhead made of red chert found in Molino San Vincenzo (Neolithic age)
(V. Schreck)*

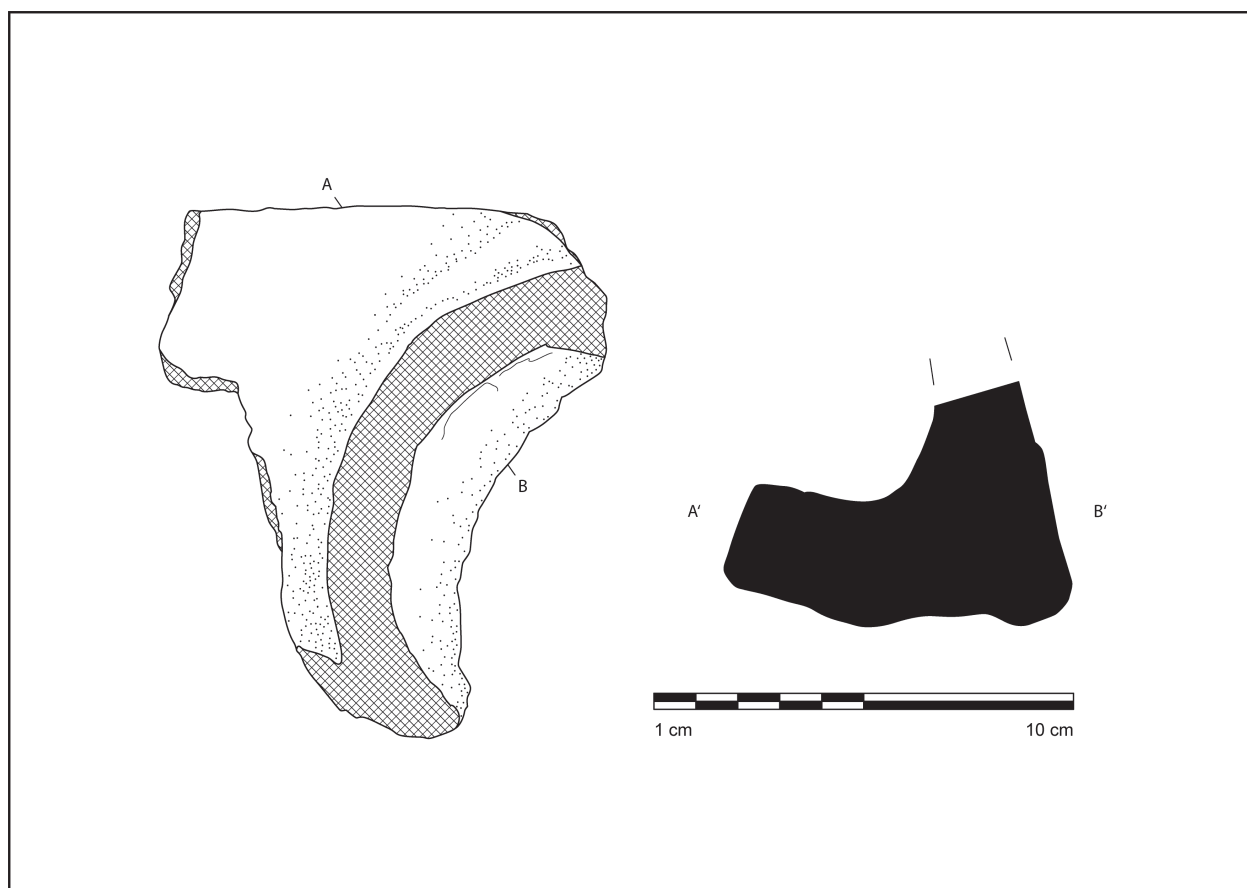
and especially transport would surely have been very expensive.¹⁵ Normally dolia were produced in specialized workshops with kilns of considerable dimension.¹⁶ Although coarse temper was used to give stability to the vessels, the surface is well-smoothed. This kind of surface treatment extended the lifespan of the vessels considerably, as it simplified cleaning.¹⁷ Dolia were either freestanding or sunk in the ground, and they have even been found in shipwrecks.¹⁸ The fragments found in Molino San Vincenzo were not discovered in situ, and therefore it was not possible to reconstruct the original installation context of the dolia. Nevertheless, their presence is an important indicator of the use of the site as a farmstead as large amounts of solids and liquids could be stored. The presence of at least eight out of ten different shapes of

¹⁵ For further information on dolia: Schreck 2018, 174–176. For the estimated weight of such vessels: Hesnard et al. 1988, 39. Archaeometrical analysis of dolia found in the villa of San Giovanni (Elba) prove the transport of such vessels over long distances. See: Manca et al. 2016, 709.

¹⁶ Manca et al. 2016, 698.

¹⁷ For the cleaning of dolia: Peña 2007, 211.

¹⁸ For a summary of the installation possibilities: Schreck 2018, 174. For shipwrecks with indications of dolia equipment: Manca et al. 2016, 695 fig. 1. See also: Firmati 2014; Hesnard et al. 1988.



Pl. 1 Fragment made of coarse ware with wide and round opening. Unknown function and dating. Found in Molino San Vincenzo (V. Schreck)

dolia, which date to the early phase of the settlement, leads to the conclusion that intensive agricultural activities were carried out in the early period. For the period from the 1st century BCE until the 3rd century CE, two containers give proof of the continuation of farming. The reduced number of dolia when compared to the previous period could indicate a reduced agricultural activity in that time. Alternatively, it is possible that a different type of storage vessel was used. Another large object of unknown function but made of the same coarse fabric as the dolia was found in Molino San Vincenzo. It is highly fragmented and has a wide round mouth and a more or less flat bottom (pl. 1; fig. 2.1–2). As it is made of the same fabric as the storage containers and has a wide round opening, it can probably be linked to both the storage and manufacturing of food as well. The number of vessels determined for the storage of large amounts of food is probably an indicator not only for subsistence farming from the 6th to 2nd century BCE but also for large-scale production intended for selling. Besides the production of foodstuffs, some findings indicate the manufacturing of textiles.



Fig. 2 1: Top view. Fragment made of coarse ware with wide and round opening. Unknown function and dating. Found in Molino San Vincenzo. 2: View from below. Fragment made of coarse ware with wide and round opening. Unknown function and dating. Found in Molino San Vincenzo (V. Schreck)

The presence of several weaving tools of different shapes and sizes is attested.¹⁹ One spindle whorl, for example, is made in the technique of *Bucchero* pottery (fig. 3), while another one has a black gloss coat (fig. 4). This indicates a dating to the late 7th and early 6th century BCE for the drop-shaped object in *Bucchero*-technique and to the period from the 4th until the 1st century BCE for the black-gloss disk-shaped fragment.²⁰ Aside from these examples of luxurious objects, several fragments of *Bucchero* vessels, gray ware jars and bowls, as well as sherds with a black gloss coat, corroborate differentiated eating habits in the early phase of the occupation of the site. Therefore, the pottery and the items intended for the food and textile production from the early phase of occupation indicate wealth and a superior lifestyle of the inhabitants of Molino San Vincenzo.

The oldest structures at the site probably underwent at least one modification. One of the structures encountered during the excavations which does not show traces of modern interventions was a small furnace. Its combustion chamber and the *praefurnium* were filled with charcoal, fragments of the clay cupola and pottery dating from the 6th to the early 1st century BCE.²¹ The youngest fragments in this structure give a clear *terminus post quem* for the reconstruction of the building, as the upper part of the cupola was levelled, probably for the installation of a new floor. Several fragments of this new pavement in *opus signinum* technique were found, yet highly fragmented.²² Some show traces of cruciform ornaments (fig. 5): These are white *tesserae* arranged around one black *tessera*.²³ As most of the structures of Molino San Vincenzo have gradually been destroyed by the plough, the floor was not found in situ. Nonetheless, the pieces of the floor can be attributed to layers above the level of the furnace. Better preserved parallels in the Comune di Modena and Comune di Sassuolo suggest a more precise dating from the 2nd to mid-1st century BCE.²⁴ This dating is confirmed by findings of a rim fragment with black-gloss coat of the form Lamboglia 27 and a plain base fragment, whose form is comparable with so-called Malacena vessels. They were incrustated with mortar, sand and fragments of tiles.²⁵ The first fragment is to be dated to the 2nd century BCE and the latter

¹⁹ In addition to the artefacts presented here, several loom weights of pyramidal shape with a hole in the upper third were found. For parallels of the shapes see, for example, the findings from Tarquinia: Perego 2012, 165–167 pl. 80. The weaving tools as well as construction pottery and lamps were not studied in my thesis, as I concentrated on pottery for the production, transport, preparation and consumption of comestible goods. Furthermore, objects for the production of pottery were studied, as they provided good information on local fabrics.

²⁰ For parallels of the shape in *Bucchero*-technique: Gran-Aymerich 2017, 107 pl. 180, 9633a1. 9633a2. The *Bucchero*-technique was used from the 7th until the early 4th century BCE. The later examples bear décor and are called *bucchero commun* or *domestique*. They were replaced by *vernice nera* vessels in the 4th century BCE: See Gran-Aymerich 2014, 123f.

²¹ For the dating of the structure: Schreck 2018, 7–9. Its size and inner structure are comparable to a small kiln of the type “a pipa”, which was found in the Etruscan city of Marzabotto: Morpurgo 2017, 354s. footnote 10 fig. 2.

²² Hagmann – Schreck 2018, fig. 10.

²³ See also: Alderighi 2011, 269 fig. 119.

²⁴ Maiolo 2013, 63f. fig. 51; Guandalini 2010, 41s. pl. 2b. This kind of ornament was preferably used in the period indicated above but also appears in Augustan times, if only sporadically: Maiolo 2013, 64.

²⁵ For the fragment of form Lamboglia 27: Hagmann – Schreck 2018, fig. 8–9.

to the period between the 4th and the 2nd century BCE.²⁶ Additives of younger age were not found in the underlay of the pavement. Therefore, the filling of the furnace and the probably simultaneous installation of the floor is to be dated around the early to mid-1st century BCE. Even if little of the structure/structures of Molino San Vincenzo remained, the careful analysis of the pottery and the findings of the highly fragmented pavement made the dating and interpretation of at least one reconstruction phase of the settlement possible. Regarding the other findings of the late Republican/early imperial period at Molino San Vincenzo, the use of pottery focused on more simple vessels: several shapes of plain drinking vessels, jugs, bowls and plates are well attested. Fragments of tableware such as Terra Sigillata were found, but to a limited extent.²⁷ Actual African Red Slip²⁸ imports were not documented at all in Molino San Vincenzo, whereby the shapes associated with these productions are well-attested by locally produced ARS imitations of plates and bowls. Mercantile contacts to northern Africa, however, are traceable thanks to imports of amphorae of different shapes, which are to be dated from the 1st until the 5th century CE.²⁹ Aside from the tableware, amphorae and coarse ware, especially cooking vessels, give good insight into a continuous occupation of the site until the 6th century CE.³⁰ As over 40% of the diagnostics were found in the plough layer, most of the pottery is in poor condition. This results from the mechanical abrasion from the ploughing and from the chemical stress caused by the intensive use of fertilizers, which made the pottery very soft and alloyed coatings and even glazes.

The urban center of Empoli – Scavo Pratesi

The findings of Empoli also show an early occupation from the 6th century BCE onwards, but to a far lesser extent than Molino San Vincenzo. While Bucchero and gray ware is not well attested in the city center, black-gloss bowls are more tangible. This trend towards distinguished eating habits continues in the following occupational periods of the settlement of Empoli: Terra Sigillata represents over 30% of the vessels used at table and especially open forms like plates and bowls were frequently used in Empoli. Interestingly, there are, in fact, actual imports of ARS in Empoli, and they focused on bowls and plates as well. Besides that, different shapes of jugs and drinking vessels, and also locally produced open forms were found. Peculiarly, ovoid jugs and beakers, which are inspired by black gloss coated beakers of the Malacena-production, were very popular.³¹

²⁶ For the dating of the fragments see MSV 19 and 134, Schreck 2018.

²⁷ Only 8.6% of the vessels used on the table had the typical thick, glossy red slip.

²⁸ The abbreviation ARS is used. At least one fragment of a cooking vessel of the form Hayes 183/184 was found. Its fabric is clearly attributable to the north African workshops.

²⁹ Schreck 2018, 164f.

³⁰ For the TS examples: Schreck 2018, 61–67 Plate 100f., for ARS imitations such as form Hayes 61: *ibid.*, 97f. Plate 117f.

³¹ For the examples and parallels discussed here: Schreck 2018, 75f.

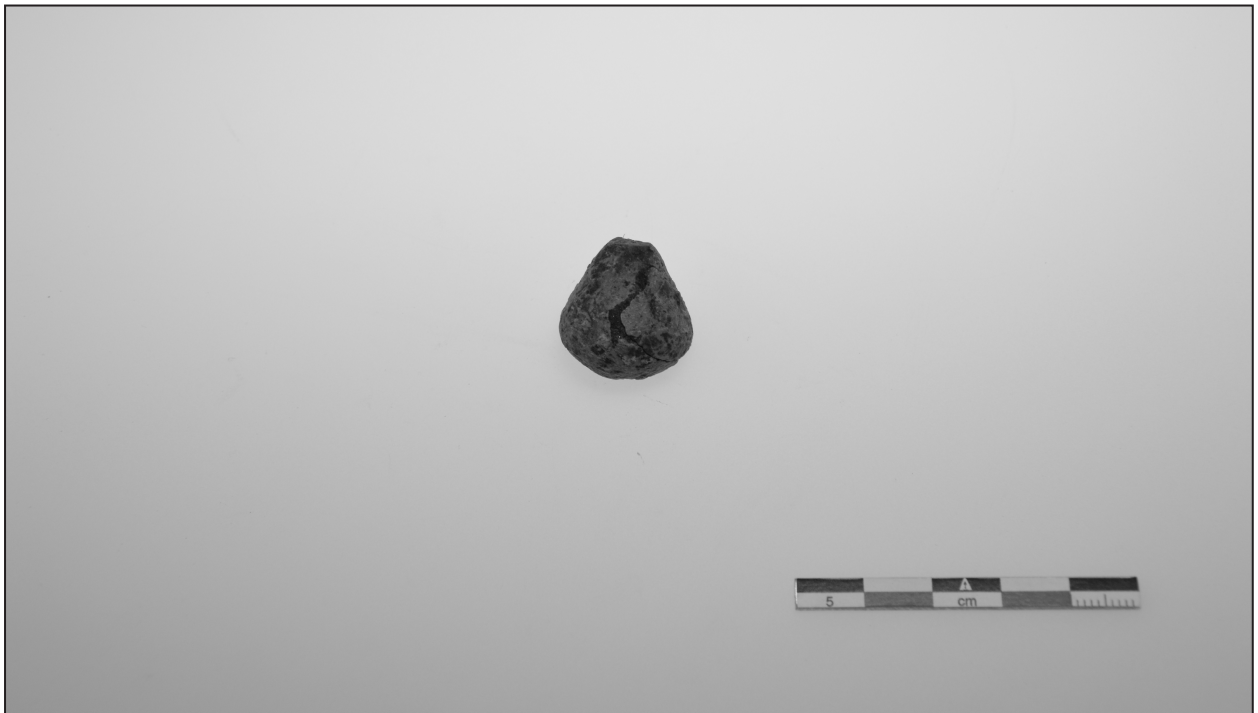


Fig. 3 Weaving tool made of Bucchero found in Molino San Vincenzo (7th/6th – early 4th century BCE) (V. Schreck)



Fig. 4 Weaving tool with black gloss coating found in Molino San Vincenzo (4th – early 1st century BCE) (V. Schreck)



Fig. 5 Detail of opus signinum floor found in Molino San Vincenzo (2nd – mid-1st century BCE) (V. Schreck)



Fig. 6 Vitrified fragments of amphorae of Empolese type found in the city center (2nd – 5th century CE). Found in Empoli (V. Schreck)

Besides the production of simple tableware, several wasters of amphorae (fig. 6) and spacers,³² objects for smoothing the surface of vessels³³ and fragments of support elements from pottery kilns³⁴ were detected, indicating a vital pottery production in Empoli from the 2nd/1st century BCE until the 5th century CE. These include - among other things - a wide range of ARS imitations of different shapes, which sometimes show a thin red slip but more often bear a coating.³⁵ The local imitations comprise shapes such as Hayes 23, 61 and a hybrid of 16/64, which date to the period between the 2nd and the 5th, probably even the 6th century CE.³⁶ These reproductions were very popular in the region: they were found in Molino San Vincenzo, Podere Piano, but also frequently in Fiesole.³⁷ Generally, the amount of amphorae in the city center is notable: nearly half of the pottery findings can be attributed to transport vessels. Furthermore, especially the so-called anfora di Empoli is well represented by a large number of diagnostics and wasters of different variations of rim forms. Besides, wasters of a predecessor of the Empolese type were identified, which was also produced at the site of Scandicci Vingone that dates to the Augustan/Tiberian time.³⁸ This indicates that the production of amphorae was established in Empoli long before the invention of the anfora di Empoli.³⁹ The high percentage of locally produced amphorae in the city center may be evidence that ancient Empoli was an important trans-shipment center for goods which were produced in the hinterland. Additionally, imported transport vessels are a clear indicator for the integration of Empoli into a well-established trading network.

Summing up, the findings of the Scavo Pratesi site indicate a continuous occupation of Empoli from the 7th/6th century BCE until the Late Antique/early Medieval period, while a more intensive settlement activity is to be dated to the 2nd/1st century BCE.⁴⁰ This is also the period of the onset of the local pottery production in the city.

4 Comparison

To obtain information on the differences and resemblances of the urban settlement of Empoli and its hinterland, a comparison of the pottery of the sites was conducted. It provides good information on settlement activity and the lifespan and function of the sites, as well as on

³² Schreck 2018, 182 pl. 97.

³³ Parallels for these objects were not found. The shapes, however, suggest a use as smoothing tools. See Schreck 2018, 182 pl. 97.

³⁴ For this kind of objects: Schreck 2018, 181 pl. 97.

³⁵ For example, Hayes 16/64 and 61: Schreck 2018, 96–98 pl. 45–48.

³⁶ For the dating of the forms see: Schreck 2018, 96–98.

³⁷ Schreck 2018, 97s. The *ceramica dipinta tarda* in Fiesole was produced locally, while the origin of the vessels without slip is not clear: De Marinis 1990, 190f. 196 pl. 32,6–7. 33. 35, 7–9.

³⁸ Shepherd 2008, 56s.; De Marinis et al. 1994, 287.

³⁹ Schreck 2018, 159. Besides the production of this shape, several wasters of Dressel 2–4 amphorae were found, which also find good parallels in the production of Vingone: *ibid.*

⁴⁰ This observation is substantiated by the only stratigraphical excavation of Empoli. The findings of the so-called Scavo Piazza della Propositura have not been analyzed yet, but the preliminary results indicate an increased settlement activity in the 2nd/1st century BCE as well. See Filippi 2007, 17.

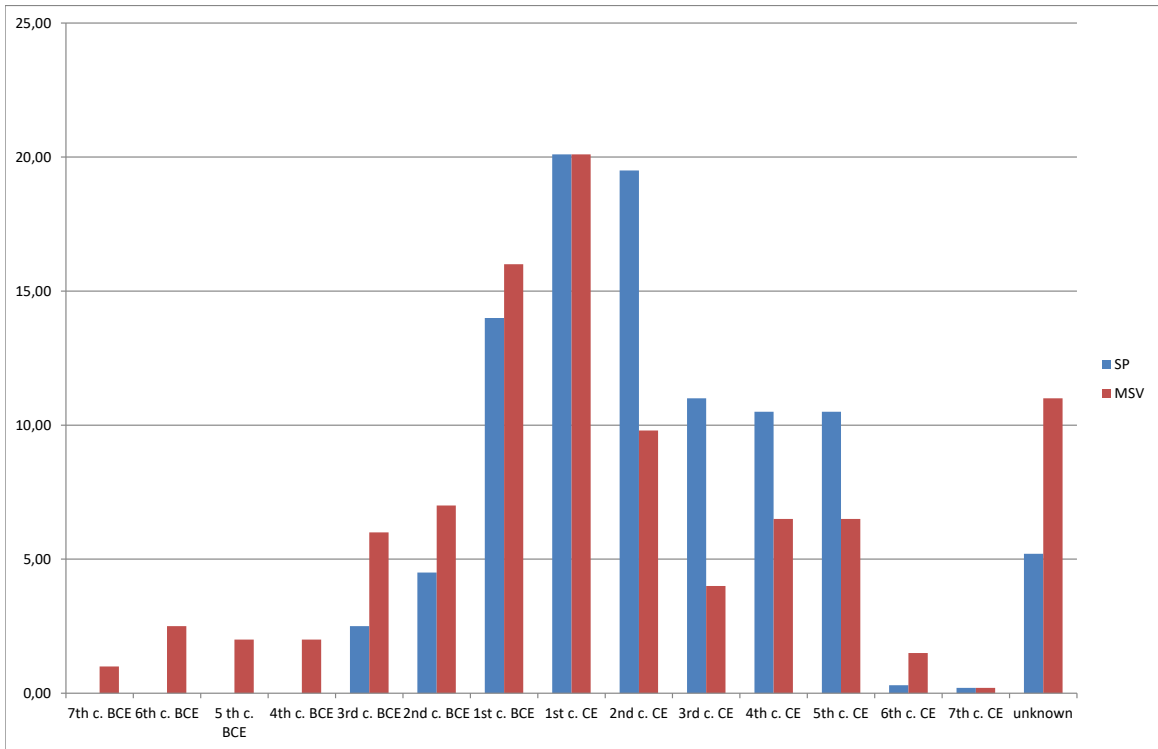


Fig. 7 Pottery in the city center (SP) and in the hinterland (MSV) in the period from the 7th century BCE until the 7th century CE (G. Schörner based on V. Schreck)

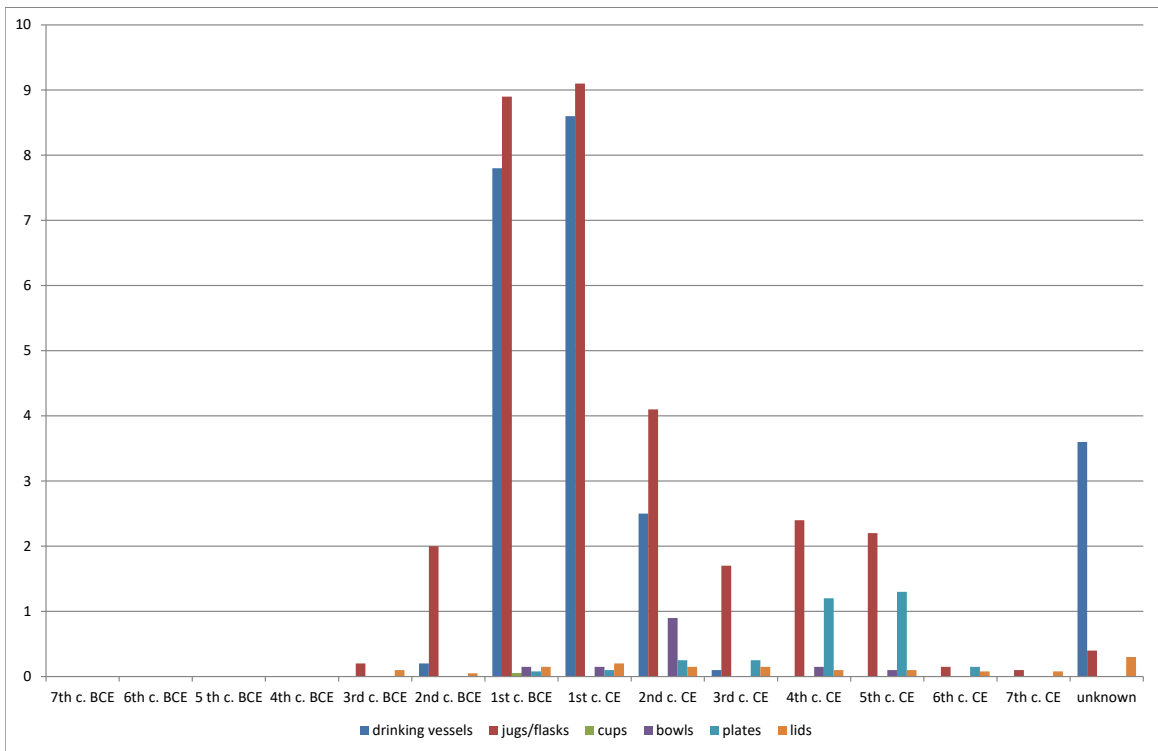


Fig. 8 Simple tableware forms of the urban center (SP) in the period from the 7th century BCE until the 7th century CE (G. Schörner based on V. Schreck)

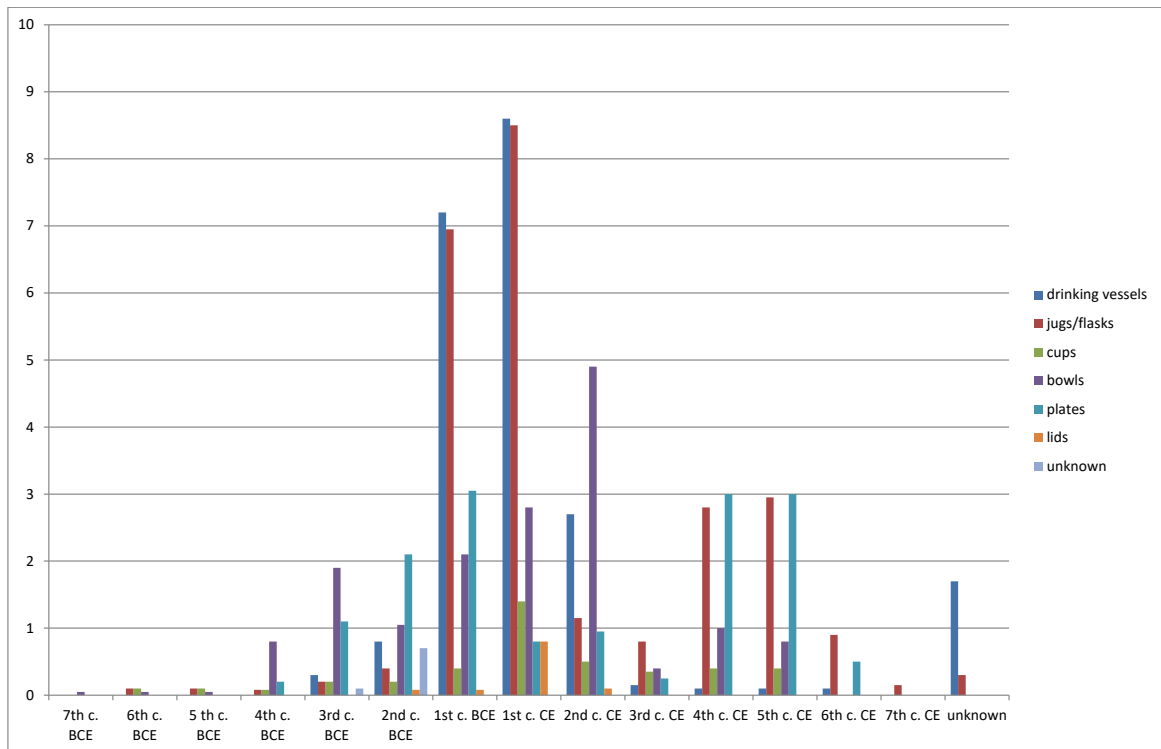


Fig. 9 Simple tableware forms of Molino San Vincenzo (MSV) in the period from the 7th century BCE until the 7th century CE (G. Schörner based on V. Schreck)

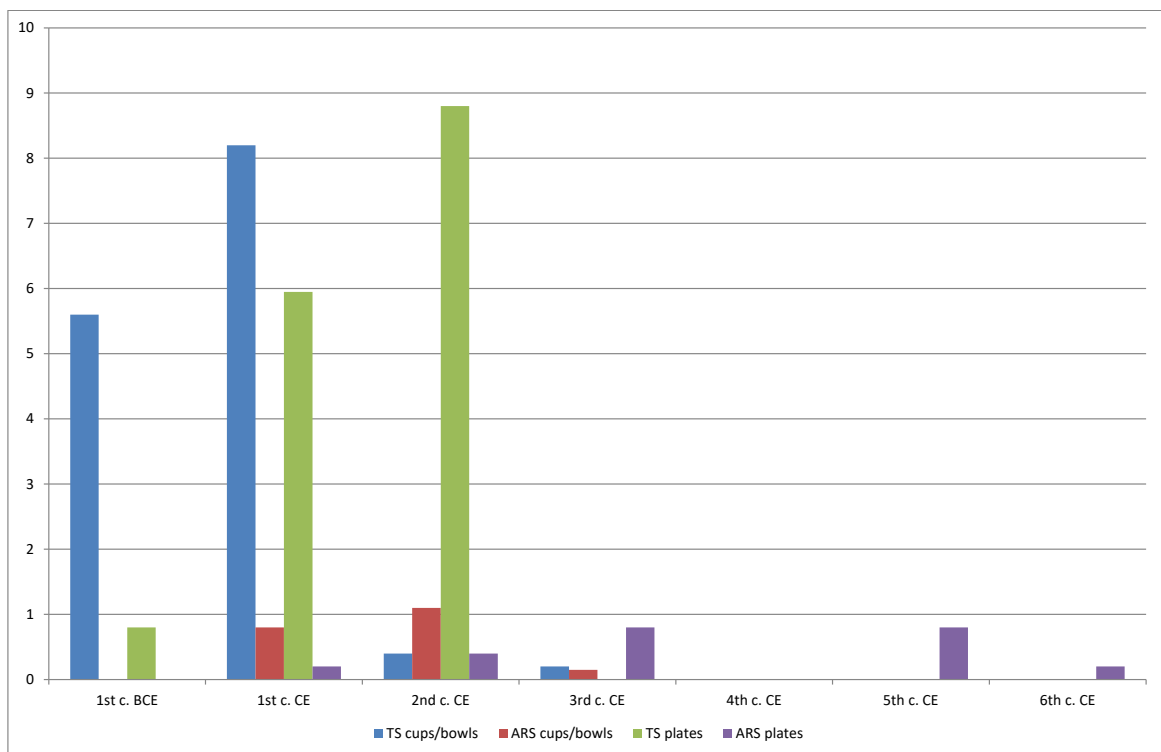


Fig. 10 Comparison of the simple tableware and elaborate tableware in the city center (SP) in the period from the 7th century BCE until the 7th century CE (G. Schörner based on V. Schreck)

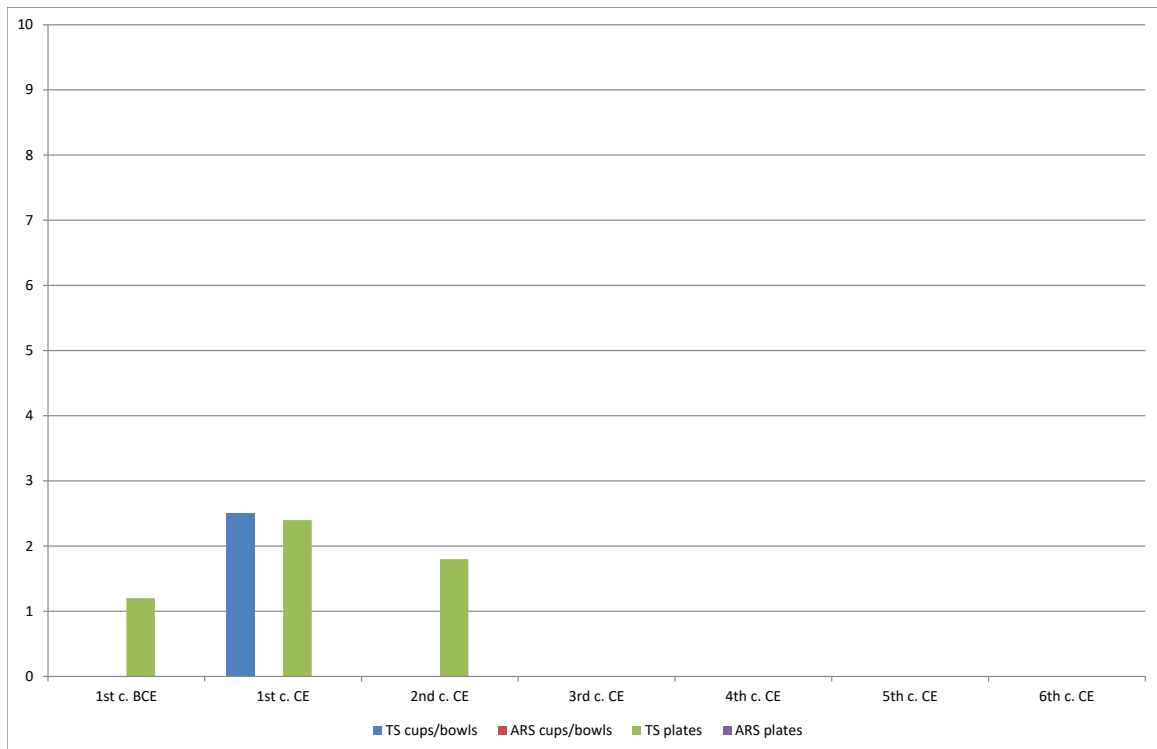


Fig. 11 Comparison of the simple tableware and elaborate tableware in the hinterland (MSV) in the period from the 7th century BCE until the 7th century CE (G. Schörner based on V. Schreck)

their integration into the micro-level and long-distance trading network of the Arno valley and Tyrrhenian Sea area. Thanks to the comparison, analogies and differences in eating habits were also traceable.

As indicated above, both sites were inhabited continuously since the 7th or the 6th century BCE at the latest, while the early phase of the urban center of Empoli is attested to a lesser extent than the one of Molino San Vincenzo (fig. 7). Regarding the ratios of analyzed pottery finds, the main phase of consolidation of Empoli falls in the 2nd/1st century BCE, which is also the period when the *via Quinctia* was installed.⁴¹ A strong increase in the amount of pottery in this period is also detectable for Molino San Vincenzo, while for both sites, the peak of pottery is traceable in the 1st century CE. In Empoli, the ratio stays stable during the 2nd century CE, whereas the ratio declines in Molino San Vincenzo in this period. Another similarity of both sites, however, is the strongly notable decline in the 3rd century CE.⁴² Whilst the city center remained stable during the following three centuries, the pottery from Molino San Vincenzo shows a further increase in the 4th century CE and another period of consolidation until the 5th century CE but then indicates that the site was probably abandoned in the 7th century CE. Therefore, the analysis of the pottery findings from Empoli and Molino San Vincenzo made it

⁴¹ Pasquinucci – Menchelli 2017, 325; Mosca 1999; Mosca 1992.

⁴² This might be linked to the so-called crisis of the 3rd century CE. Many thanks to P. Amann for this observation. For a short overview on the topic see: Körner 2008.

possible to prove a continuity of occupation for both sites from the 7th/6th century BCE until the Late Antique/early Medieval period.

The comparison of the shapes and wares from both Empoli and Molino San Vincenzo also produced good results. It was possible to detect the typical forms of the middle Arno valley via the identification of wasters in Empoli. Forms such as ovoid beakers and cups as well as small plates and deep bowls with well-rounded lips were very popular in the study region. Regarding the ratios of the shapes of tableware,⁴³ differences and similarities can be shown for the whole period of interest from the 6th century BCE until the 6th century CE (fig. 8 and 9).

Regarding the simple beakers and jugs, both sites show parallels as well: these forms show a high peak during the 1st century BCE and the 1st century CE and a strong decline until the 3rd century CE. In contrast, the presence of open forms like plates and especially bowls seems to indicate great differences in the usage of pottery in the urban center and the site in the hinterland. In Molino San Vincenzo, the percentage of open forms without glossy coating is well-provable from the onset of the site's occupation onwards. In contrast, these forms are detectable to a much lesser extent in Empoli. This appears to be surprising at first and seems to indicate the consumption of different aliments in Roman times at first glance. Yet, when taking into consideration more elaborate dishes of tableware, Terra Sigillata and ARS plates and bowls, the picture changes (fig. 10 and 11): as the Terra Sigillata vessels are generally much better represented in Empoli, the majority of plates and bowls that were found in the city center comprise these wares. African Red Slip Ware was found in Empoli as well, while this ware is not attested in Molino San Vincenzo at all but was indeed imitated locally. Thus, the Terra Sigillata and African Red Slip plates and bowls appear to have replaced the simple tableware bowls and plates in Empoli over time. The Terra Sigillata shapes are strongly represented in the period from the 1st century BCE until the 2nd century CE and the African products were imported from the 1st and 2nd century CE onwards. After the 3rd century, vessels of African origin became increasingly popular in the region in general. The imports itself are not traceable in large numbers, but the pottery workshops of Empoli started to imitate typical forms such as Hayes 23, 61 and 16/64 in plain ware or as diluent color-coated variants and they began to develop local variations of the shapes. The latter vessel types are also well-attested in Molino San Vincenzo and are made of the local fabric. In contrast, elaborate tablewares such as Bucchero, gray ware and black-gloss coated vessels are well-represented in the early phase of Molino San Vincenzo, while the simple tableware starts to dominate from the 3rd century BCE until the end of the occupation of this site. Empoli, however, does not show a high percentage of these early wares.

Another considerable difference between the sites can be shown by the distribution of large supply containers: they were only found in Molino San Vincenzo. At least ten different types of dolia are attested at this rural site. Eight out of the ten shapes can be dated to the period

⁴³ In my thesis, simple tableware was distinguished from a more sophisticated tableware. Following this, 'sophisticated tableware' includes Bucchero, gray ware and pottery with a glossy coating such as Terra Sigillata and ARS. The term simple tableware refers to vessels for daily use, which lack a thick glossy coating.

between the 6th and the 2nd/1st century BCE. This indicates a probably large-scale agricultural activity for that period, as these large containers were necessary for the storage and/or the fermentation of large amounts of goods. Whether there was a change in the function of the settlement or whether the way of storing simply changed cannot be said with certainty due to the poor state of preservation of the site's identified structures. The general interpretation of Molino San Vincenzo as an agricultural production unit, at least for the early phase of occupation, can, however, clearly be concluded, which is possible thanks to the findings of the large storing containers. Therefore, the results of the comparison of the vessel shapes indicate that both investigated sites were inhabited from the 7th/6th century BCE onwards and that eating habits in Roman times were probably similar in the urban center and its hinterland. In contrast, the quality of the vessels was diverse: while high-class vessels are well-attested in Molino San Vincenzo in the period from the 6th until the 3rd century BCE, more simple pots were used more frequently in the subsequent period. In Empoli, extravagant pottery is well-attested by Terra Sigillata and ARS products, which are not as common in Molino San Vincenzo.

5 Archaeometrical analysis and economic exchange

To reconstruct the economic exchange in the middle Arno valley, it was very important to identify the local, regional and extra-regional fabrics used for the analyzed pottery findings. Therefore, around 1500 samples were taken, and their tempering was analyzed. A familiarity with the typical sediments of the region was essential to identify the local production of pottery. In addition, archaeometrical analyses were undertaken by C. Capelli from the University of Genoa. He analyzed and classified 60 samples using thin sections. With the help of this data, it was possible to catalogue most of the findings by visual examination under the microscope⁴⁴ and to categorize the pottery as deriving from local, regional and supra-regional productions.⁴⁵ It was also possible to identify eight fabrics (A–H) from the thin sections, and during the visual examinations under the microscope, another seven groups were classified.⁴⁶

Besides the locally produced fabrics A and D, fabrics C, E and G are of regional origin.⁴⁷ Fabric E is especially easy to identify: it is a coarse-tempered fabric with calcite particles, which are discernible due to their optical appearance, which is edgy and the minerals are mostly transparent to light-opaque. Fabric E was exclusively used for kitchenware/ cooking ware. Due to the continuous use on fireplaces, the colour of the matrix ranges from dark and reddish brown to very dark gray. Fabric E was probably produced in the area of Pisa, although there

⁴⁴ For the criteria used: <http://facem.at/project/about.php#method> (01.07.2018)

⁴⁵ For the definition of the terms of local, regional and supra-regional: Schreck 2018, 15–19. This definition is based on the travel speed and was developed together with R. Woller. See Woller 2017, 86f. Cf. also the contribution of R. Woller in this volume. At this point I want to thank my colleague and friend for the fruitful and interesting cooperation.

⁴⁶ For the description of the fabrics and their place of origin: Schreck 2018, 44–54.

⁴⁷ The additives of fabric B were referred to the alluvial region of the Arno valley as well as to its tributaries. Therefore, the fabric was identified as local/regional. Fabric F originates in southern Etruria or in Latium, while the provenance of fabric H is unknown.

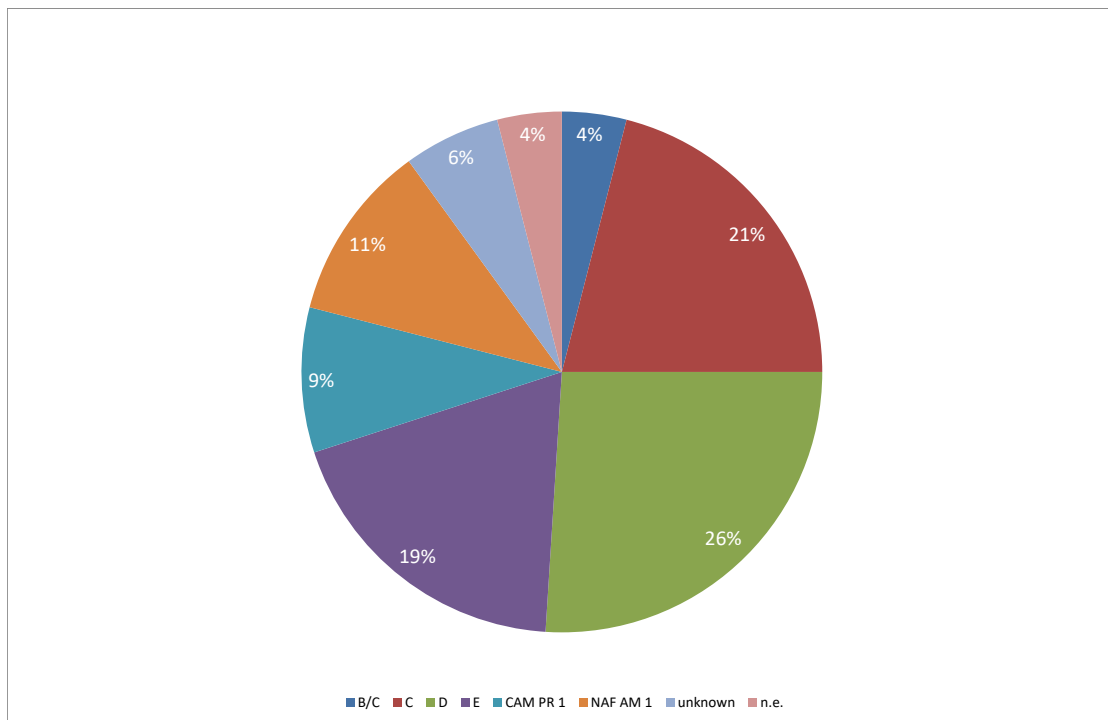


Fig. 12 Fabrics of cooking ware from the urban center (SP) (G. Schörner based on V. Schreck)

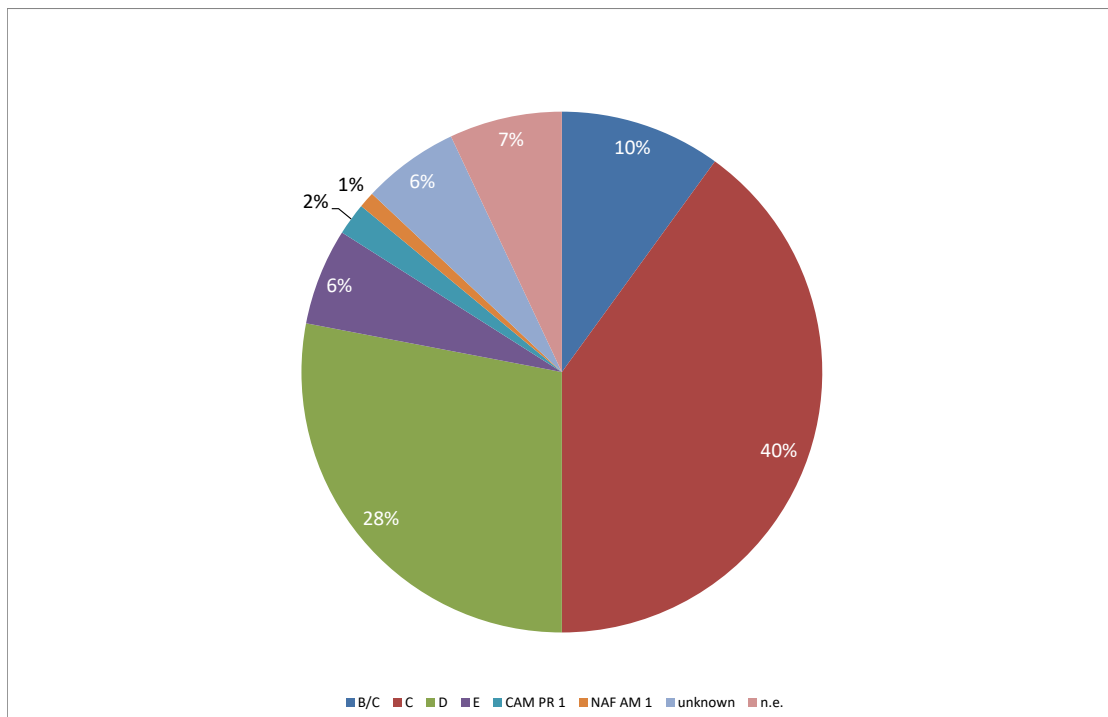


Fig. 13 Fabrics of cooking ware from the hinterland site (MSV) (G. Schörner based on V. Schreck)

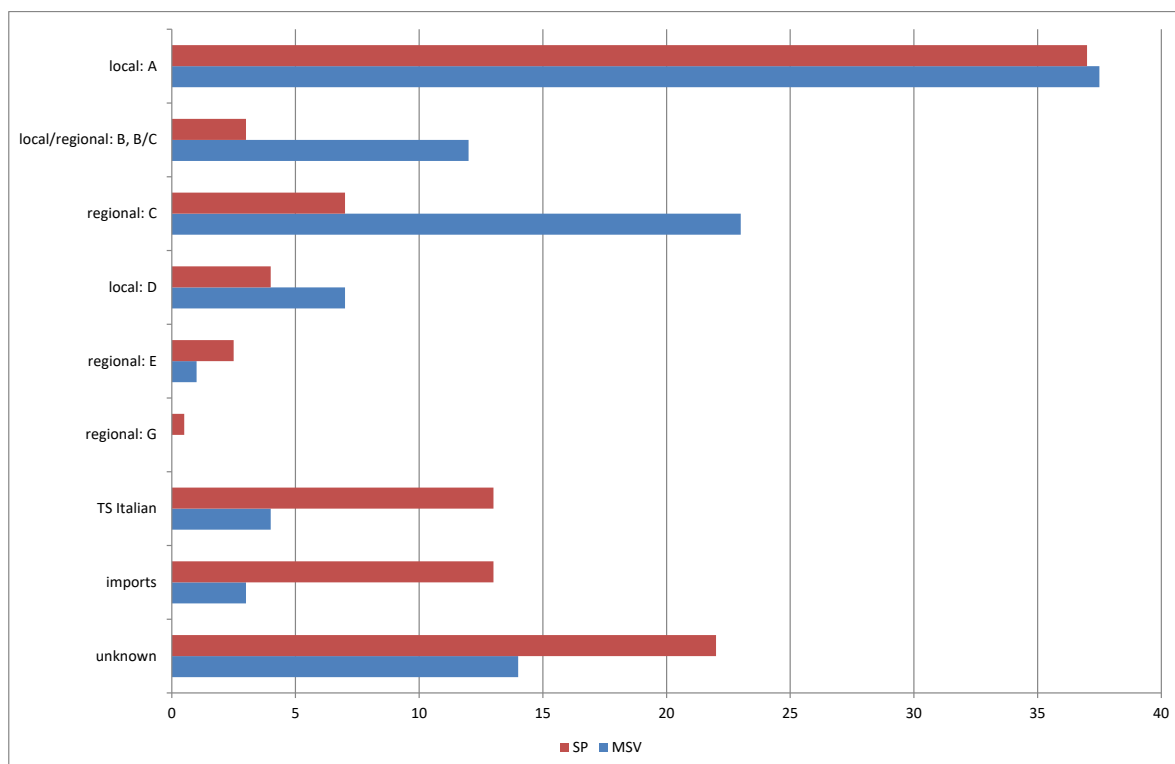


Fig. 14 Fabrics from the two sites Empoli (SP) and Molino San Vincenzo (MSV) (G. Schörner based on V. Schreck)

are several other outcrops in the area of the coast of the Tyrrhenian Sea, which could potentially have also been the origin of the raw material used for fabric E.⁴⁸ The calcite particles have an excellent heat coefficient, which makes them a perfect temper for cooking vessels such as cooking pots, pans and lids. Therefore, a repeated heating and cooling of the cooking vessels was possible without the danger of cracks or the destruction of the pots. Besides, the existence of the idiomorphic minerals in the fabric is an indicator that the vessels were kilned below a temperature of 850 °C degrees.⁴⁹ The comparison of the pottery found in the urban context with that of the rural site revealed some peculiarities regarding the cooking ware. A large part of the cooking ware in the urban center was made of fabric E. Other vessels made of fabrics which can be traced to Campania and North Africa, and which were regionally or even supra-regionally imported to Empoli, indicate the good integration of the city center into the

⁴⁸ See nos. 36, 37 and 41 on the soil map of Tuscany of the European Soil Data Centre: <http://esdac.jrc.ec.europa.eu/resource-type/national-soil-maps-eudasm?field_data_continent_tid_selective=1266&field_data_country_country_selective=All&field_data_cont_coverage_value=0&page=11&items_per_page=50> (28.07.2017)

⁴⁹ Many thanks to Prof. Ottner from the University of Natural Resources and Life Sciences, Vienna for this information.

trade network. On the contrary, the supply of pottery made of fabric E and its imports to the hinterland are traceable to a much lesser extent (fig. 12 and 13).

This leads to the interpretation that in Molino San Vincenzo, the purchase of ceramic goods concentrated on the local and nearest regional market, as locally and regionally produced fabrics dominate at this site. The cooking ware of Empoli, however, shows the excellent integration in the local, regional and supra-regional trade network. In addition, the results of the study indicate that the main trading route for imported cooking ware was the Arno river in an upstream direction. This observation is confirmed by the overall trend of the entire pottery findings of both sites (fig. 14). Aside from the locally produced fabric A, which is represented very well at both sites, a trend towards vessels made of local and regional fabrics can be especially observed in the hinterland. The acquisition of goods in Molino San Vincenzo seems to have concentrated on the micro-level and the nearest regional level, while in Empoli a vital exchange of goods is recognizable via imports of regional goods and supra-regionally traded amphorae, tablewares and cooking wares. A part of the high percentage of unknown fabrics in the city center derives from a great number of thin-walled fine-tempered drinking vessels. It was not possible to identify their fabric with the help of the visual examinations nor by fabric databases and publications on this topic; this circumstance is mostly due to the fine-grained temper. It is therefore very likely that some of these vessels were imported as well, as there are several shapes which have good parallels with findings in the north Italian region, Cosa and Pozzuoli.⁵⁰

6 Conclusion

Thanks to the analysis of the vessels and fabrics found in Empoli and its hinterland, a vital local and regional network of pottery production was identified. It was possible to detect the typical shapes which were used and produced in the middle Arno valley. Furthermore, the main direction of trade for the purchase of pottery products of Empoli could be determined: the imported goods were transported from the Tyrrhenian coast upstream along the River Arno using the *via Quinctia* or the river itself. Due to the research presented here, it was possible to identify Empoli as an important distribution center for the region of the middle Arno valley for both incoming and outgoing goods. Moreover, the research results correlate with survey results conducted in the *ager Pisanus* and *ager Volaterranus*: although small farmsteads participated in exchange, imports of goods are provable to a lesser extent, while the supply in the city centers was well- and densely organized.⁵¹

Molino San Vincenzo looks back on a long history of occupation. The oldest artefact found dates back to the Neolithic age. The onset of settlement activity can be traced back to the 7th/6th century BCE. Especially the findings of the site's early phase indicate vivid agricultural activities and an extravagant lifestyle with sumptuous vessels. This, however, changed over time and from the 3rd century BCE onwards, simple pottery was favored. Regarding the in-

⁵⁰ For the forms and their parallels: Schreck 2018, 71–81.

⁵¹ Pasquinucci – Menchelli 2017, 332f.

tegration in the trade network, Molino San Vincenzo participated in large-scale commercial activities. However, when compared to the city center of Empoli, which had direct access to the main infrastructural facilities of the middle Arno valley, a stronger focus on the micro-level and on regional trade was identified.

In conclusion, one can emphasize Empoli's role as a center of certain importance for the region investigated, which was well-integrated into the infrastructural network. The hinterland of Empoli with the peripheral site of Molino San Vincenzo, on the other hand, concentrated on trading contacts at the local and regional level. Therefore, we can claim that the study region of the middle Arno valley in general was far from being at the back of beyond. Besides that, traces of continuous inhabitation from the 6th century BCE until the 6th century CE were recorded both for the city center and the rural site of Molino San Vincenzo, which further highlights the significance of regional contacts and supply systems.

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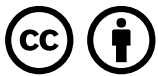
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