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ROMAN POTTERY PRODUCTION IN THE PONTINE PLAIN, CENTRAL ITALY

Introduction

The Groningen Institute of Archaeology (GIA) has conducted field campaigns in the Pontine region in central Italy since the 1970s, when it became a partner in the excavations of ancient *Satricum*. Since then, it has extended its scope with field surveys, intensive site mappings, targeted excavations and geo-archaeological examinations throughout the region, within the context of the Pontine Region Project.¹ Most of this work has focused on the study of the immediate hinterland of Roman and Latin towns, such as *Antium*, *Norba* and *Setia*. However, much less is known about areas further away from these towns, where other types of settlements may have fulfilled central-place functions for the rural population.

In addressing this issue, the current phase of the project focuses on the role of minor centres in the rural economy of the Pontine region. The term ‘minor centres’ encompasses all kinds of rural settlements, which served as central places where craft production took place, goods were exchanged, where religious feasts were held or administrative tasks were carried out.² The research project targets three case studies, comprising *Astura* on the coast, and *Forum Appii* (*Borgo Faiti*) and *Ad Medias* (*Mesa*), both situated on the *Via Appia* (fig. 1). It combines four different, but complementary approaches: two researchers examine the layout, function and development of the minor sites under study, using geophysical prospections and on-site field surveys. Off-site surveys around each centre aim to understand their role in the local settlement system. The other two researchers focus primarily on the pottery collected during the field surveys and combine typo-morphological classifications with petrographic fabric analysis.³ The project aims to investigate the relationships between the aforementioned minor centres and their immediate surroundings, by studying mechanisms of pottery production and distribution.

This paper presents the pottery production facilities documented so far, and provides fabric descriptions of the wasters that have been collected on both minor centres and

rural sites. It aims to investigate which types of raw materials and recipes were used, and whether potters used similar raw materials for the production of ceramic building materials and pottery. It also tentatively identifies aspects of the organisation of pottery production at the sites under study. These sections will be preceded by an introduction to the region and sites under study.

The sites under study

The Pontine region is situated c. 60 km south of Rome. It consists of a large coastal plain, which is bounded by the Alban Hills and the Lepini and Ausoni Mountains to the north and east, and by the Tyrrhenian Sea to the west. The inner most part of this plain is formed by an infamous wetland, known as the Pontine marshes, that was reclaimed and opened up with the construction of the *Via Appia* in the late 4th century BC (fig. 1).

Forum Appii is situated on the 43rd mile of the *Via Appia* at the confluence of the Cavata River and the *Decennovium* canal, both of which are thought to have been navigable in antiquity (fig. 2a). The status of the site as a *forum* and possibly a *municipium* from the 1st century BC onwards suggests that it functioned as a local market where administrative tasks were performed. Geophysical survey and field walking identified a number of features related to craft activities in three different parts of the settlement.⁴ First, evidence for metal working and a number of structures were mapped in the southern area along the *Decennovium* canal. The structures are thought to comprise warehouses, possibly connected to a harbour, as suggested by written sources.⁵ Second, northwest of the river confluence four kilns were identified. They were uniform in size (4 m in diameter), and grouped in two clusters. The two clusters were located at 4 m from each other. The clustered kilns were flanked by a small square structure, and a possible fifth kiln was identified slightly to the north. Unfortunately, insight in the types of products manufactured here could not be gained, since permission to survey the area was not obtained. Third, an industrial zone was identified 150 m northeast of the settlement, based on the presence of three kilns and numerous misfired fragments. They appear to be associated

¹ ATTEMA 1993; ATTEMA/BURGERS/VAN LEUSEN 2010; ATTEMA/DE HAAS/TOL 2011

² TOL ET AL. 2014.

³ Tymon de Haas and Kayt Armstrong conduct the field surveys and geophysical prospections, whereas Gijs Tol and Barbara Borgers focus on the typo-morphological and petrographic fabric descriptions of the pottery.

⁴ TOL ET AL. 2014.

⁵ HORACE, *Satires* 1,5.

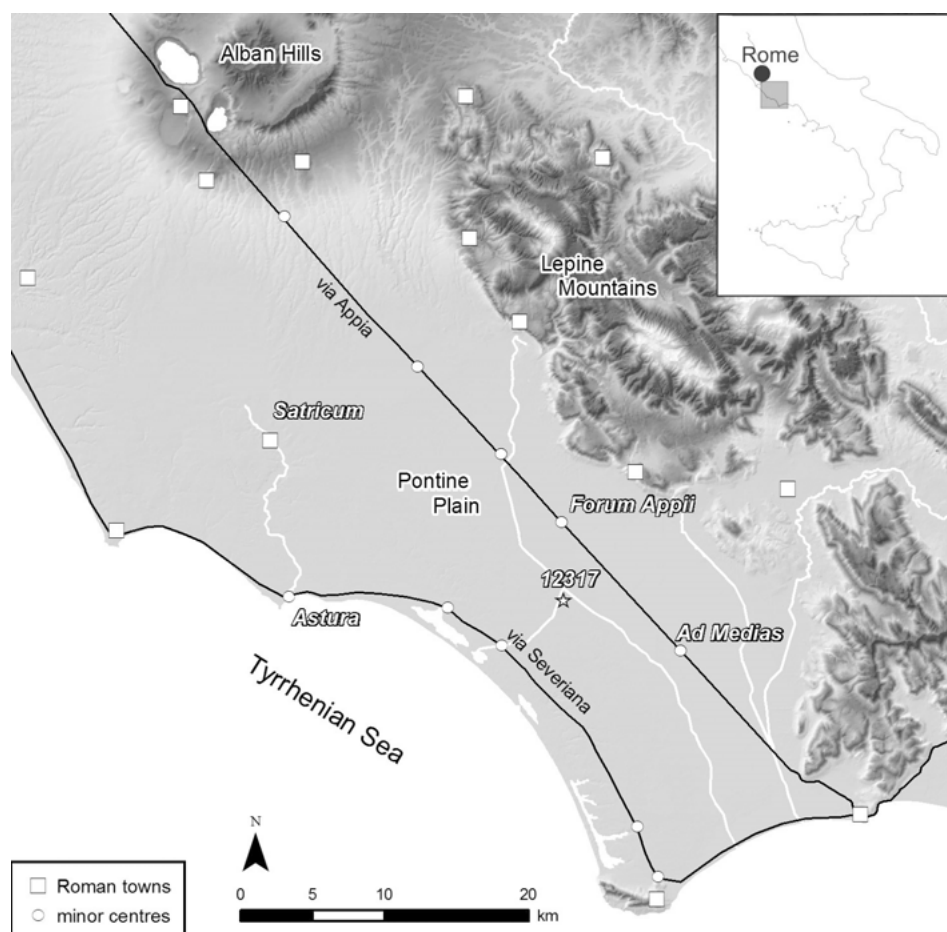


Fig. 1. Map of the Pontine region, situated c. 60 km south of Rome, which is bounded by the Alban Hills and the Lepini and Ausoni Mountains to the north and east, and by the Tyrrhenian Sea to the west. Three minor centres under study are indicated, comprising *Forum Appii*, *Ad Medias* and *Astura*.

with refuse pits, including *tegulae* (tiles), *imbrices* (cover tiles), and some handles, most likely deriving from Dressel 1 type amphorae. The production activity of the workshop(s) is tentatively dated to the late 2nd or 1st century BC, based on the typo-chronological evidence of the production waste and associated surface ceramics. The fabric descriptions presented below result from misfired pottery that was identified in this area of the site.

Ad Medias is situated between the 51st and 52nd mile of the *Via Appia*, and is mentioned as a *mutatio* in a late antique itinerary, suggesting that it was a place where travellers could find a room for the night, and obtain vehicles or animals for the next leg of their journey (fig. 2b).⁶ The presumed centre of the site is largely covered by the 18th century *Casale di Mesa di Pontinia*. Geophysical prospections and on-site surveys targeted both sides of the *Via Appia*, and yielded ample evidence for craft activities. To the south of the road, one kiln and numerous metal slag fragments were found. To the north of the *Via Appia*, numerous fragments of kiln debris and wasters of building ceramics and Dressel 1 type amphorae were collected during field walking. This suggests the presence of a pottery workshop, although no *in situ* kilns

were mapped in this area during the geophysical survey. This workshop must have operated during the 2nd or 1st century BC, based on the typo-morphology of the misfired pottery.

Besides the two minor centres, a small rural site (12317), situated near the 45th mile of the *Via Appia*, also yielded evidence for pottery production. The site is located in the interior plain near the Rio Martino canal, which drained the lower Pontine plain to the Tyrrhenian coast (fig. 1).⁷ Geophysical prospection revealed the presence of a substantial pottery kiln with a diameter of 5 m, and several anomalies that may represent clay pits (fig. 3). Finds resulting from field surveys include kiln fragments and wasters of *dolia*, whose production is tentatively dated to the late 2nd or 1st century BC, based on associated surface ceramics.

The discovery of the infrastructure related to potting activities and pottery wasters at the two minor centres and the rural site is very important because of its potential for providing secure reference material for local fabrics. A selection of the recorded pottery wasters were examined in thin section analysis, and the petrographic fabric descriptions are presented below.

⁶ TOL ET AL. 2014.

⁷ DE HAAS 2011, 98–99.

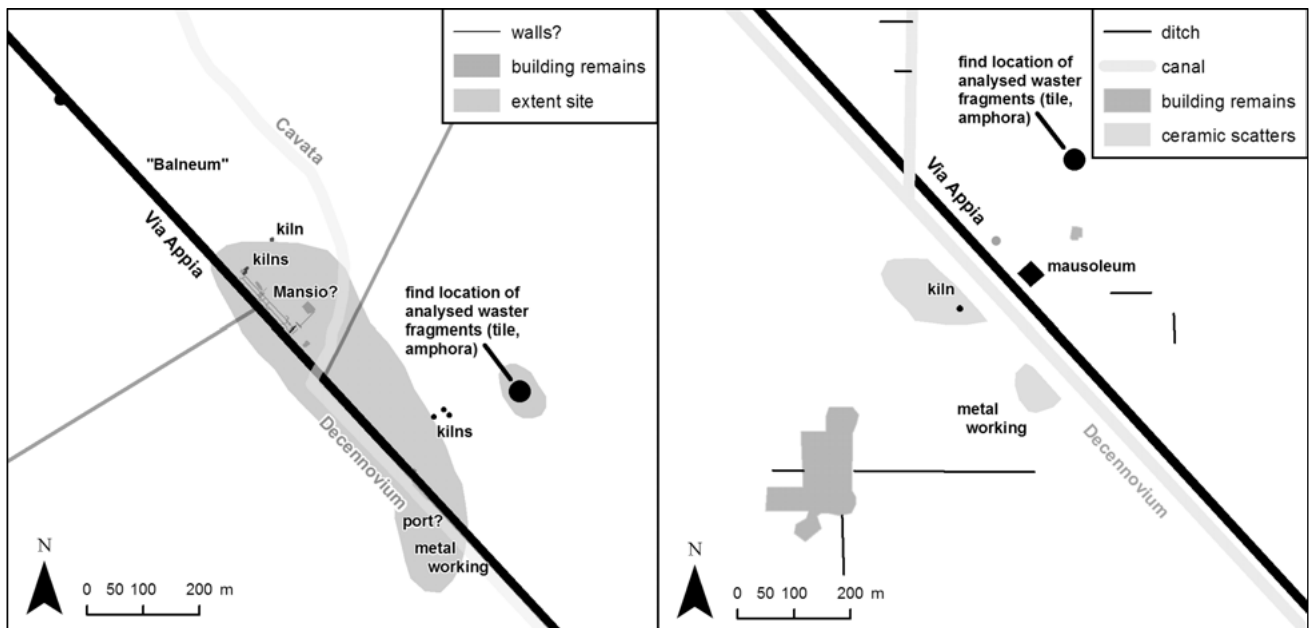


Fig. 2. The sites of *Forum Appii* (fig. 2a) and *Ad Medias* (fig. 2b) with indication of the pottery kilns find location of the pottery wasters, including ceramic building material and amphorae.

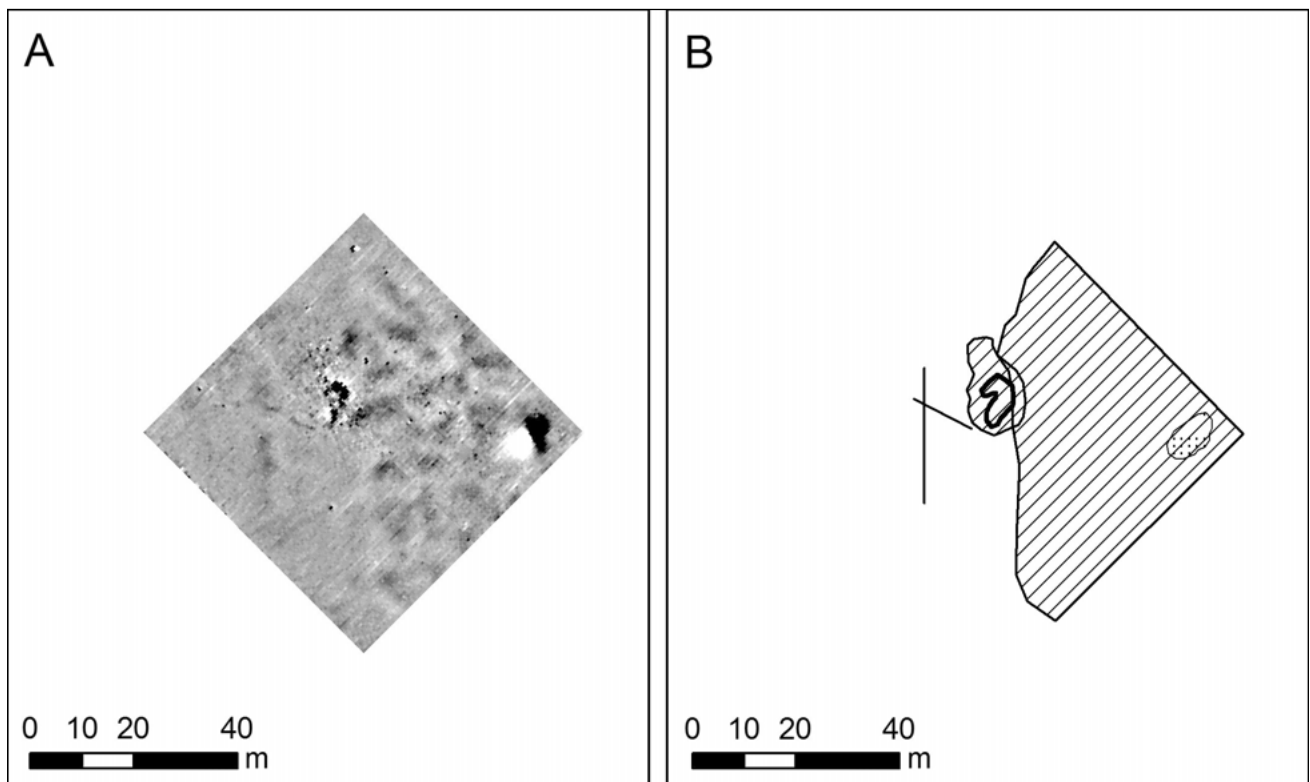


Fig. 3. The small rural site 12317 with the anomalies shown in the geophysical survey (fig. 3a), which have been interpreted as a pottery kiln with adjacent clay pits (fig. 3b).

Method

A total of 35 diagnostic ceramic samples were selected from the three pottery production sites under study. They were prepared as standard 30 µm sections, and analysed under a polarising light microscope at the GIA laboratory. The ceramic thin sections were grouped in fabrics, based upon the nature of the clay matrix, inclusions and voids⁸, with the underlying aim of identifying important evidence for technological processes and provenance.

In addition, a program of raw materials prospection has been carried out, using a geological map of the area.⁹ Sixteen clay samples were collected near the sites where pottery wasters were identified, and where geophysical research indicated the presence of infrastructure related to pot-making activities. The clay sourcing campaign targeted specific areas around the production sites, and took into account the minerals and raw materials identified in the ceramic thin sections.

Typo-morphology and Fabric Descriptions

In this section, we describe the shapes and petrographic fabrics of the waster vessels identified at *Forum Appii*, *Ad Medias* and site 12317.

Forum Appii

From the site at *Forum Appii*, waster fragments of tiles, cover tiles and amphorae were examined in thin section petrography. Tiles and cover tiles have long been used as functional architectural materials. For the manufacture of tiles, the clay is pressed into a rectangular frame to form a slab, or formed with a mould, whilst cover tiles, also made in a rectangular mould, are formed by draping a slab over a rounded form.¹⁰ The tiles at *Forum Appii* are rectangular with upstanding rim, and are up to 4 cm thick. The cover tiles are gritty on the inside, and are around 2 to 2.5 cm thick. After thorough drying, they are fired to obtain a durable product. Neither tiles nor cover tiles are covered with paint, slip or glaze, and most waster fragments exhibit substantial production defects. For instance, a number of them are over-fired, which occurs in association with pronounced reduction, whereas others are vitrified and characterised by a bloated surface. Both tiles and cover tiles are manufactured in three different fabrics, comprising a coarse, a mixed clay and a fine version of what otherwise appears to be the same red firing clay. This suggests that there was no strong link between fabric and shape.

The coarse fabric is characterised by sand-sized angular sanidine feldspar, sub-rounded augite and rounded quartz and weathered zeolite inclusions (2.5 mm). Occasionally, reddish brown clay pellets (2.5 mm) and mica inclusions (1 mm) can be identified in the red clay (fig. 4a). The firing temperature of the artefacts varies, as suggested by the optical activity of the matrix. When the tiles are over-fired, their

colour darkens from reddish to deep brown and eventually grey with a yellowish bloated surface colour.

The clay mixing fabric contains sand-sized angular sanidine feldspar, sub-rounded augite, and rounded quartz and weathered zeolite inclusions (2.5 mm). Macroscopically this fabric cannot be distinguished from the coarse fabric. However, the difference is noted in thin section analysis, where streaks of two types of clay can be identified. The first is red firing with fine biotite inclusions and heterogeneous due to silt-sized iron-rich inclusions, whilst the second clay is light-coloured and contains mainly fine quartz inclusions (fig. 4b).

The fine fabric contains sub-rounded quartz, weathered augite and angular sanidine feldspar inclusions (< 1.5 mm) in a red firing clay. The samples are fired at a high temperature, and possibly over-fired. This is suggested by the dark colour of the sherds in hand specimen, and by the reaction rim around the clay pellets in thin section.

The recovered amphora handles are oval-shaped, and attached to the body during the leather-hard stage. Their fabric is characterised by well-sorted mono-crystalline quartz, sanidine feldspar and augite (< 1 mm) in a red firing clay. Occasionally, weathered zeolite inclusions (2 mm) can be identified in the coarse fraction, comprising 5% of the matrix (fig. 4c). Heterogeneity in the clay matrix is caused by numerous small iron-rich inclusions (< 1 mm). The mineralogical composition of the amphorae suggests that it may comprise a fine, processed, version of the red clay, used for the production of ceramic building materials at the site. Misfires of this type of vessel exhibit a wide range of colours: some are grey and have been accidentally fired in reducing atmosphere, whereas others are yellow-beige to reddish brown, resulting from a uneven distribution of air during the firing process.¹¹ The majority of the fragments are characterised by bloated pores, indicating that they were over-fired.

Ad Medias

At *Ad Medias*, a similar range of products has been attested, including ceramic building materials and amphorae, and their fabrics were described in thin section analysis. A red firing clay, similar to the one at *Forum Appii*, has been used for their production, with the difference that the typical fabrics from *Ad Medias* are fine and do not contain diagnostic mineral inclusions.

The tiles and cover tiles are characterised by occasional sand-sized sanidine feldspar and weathered zeolite inclusions (2 mm) in a red firing clay. Occasionally, reddish brown clay pellets (2 mm) and quartz and mica inclusions (1 mm) can be identified. Hence, this fabric is largely similar to the fine fabric from *Forum Appii*, with the difference that it does not contain coarse augite inclusions. Typical wasters include artefacts that have been accidentally fired in reducing atmosphere.

The amphora fragments comprise handles and body sherds, and they are characterised by well-sorted quartz and sanidine feldspar inclusions (< 0.5 mm) in a red micaceous

⁸ QUINN 2013, 73–79.

⁹ The clay sourcing campaign has been carried out with Jan Sevink from the University of Amsterdam.

¹⁰ WARRY 2006, 246–265.

¹¹ RYE 1981, 121–122.

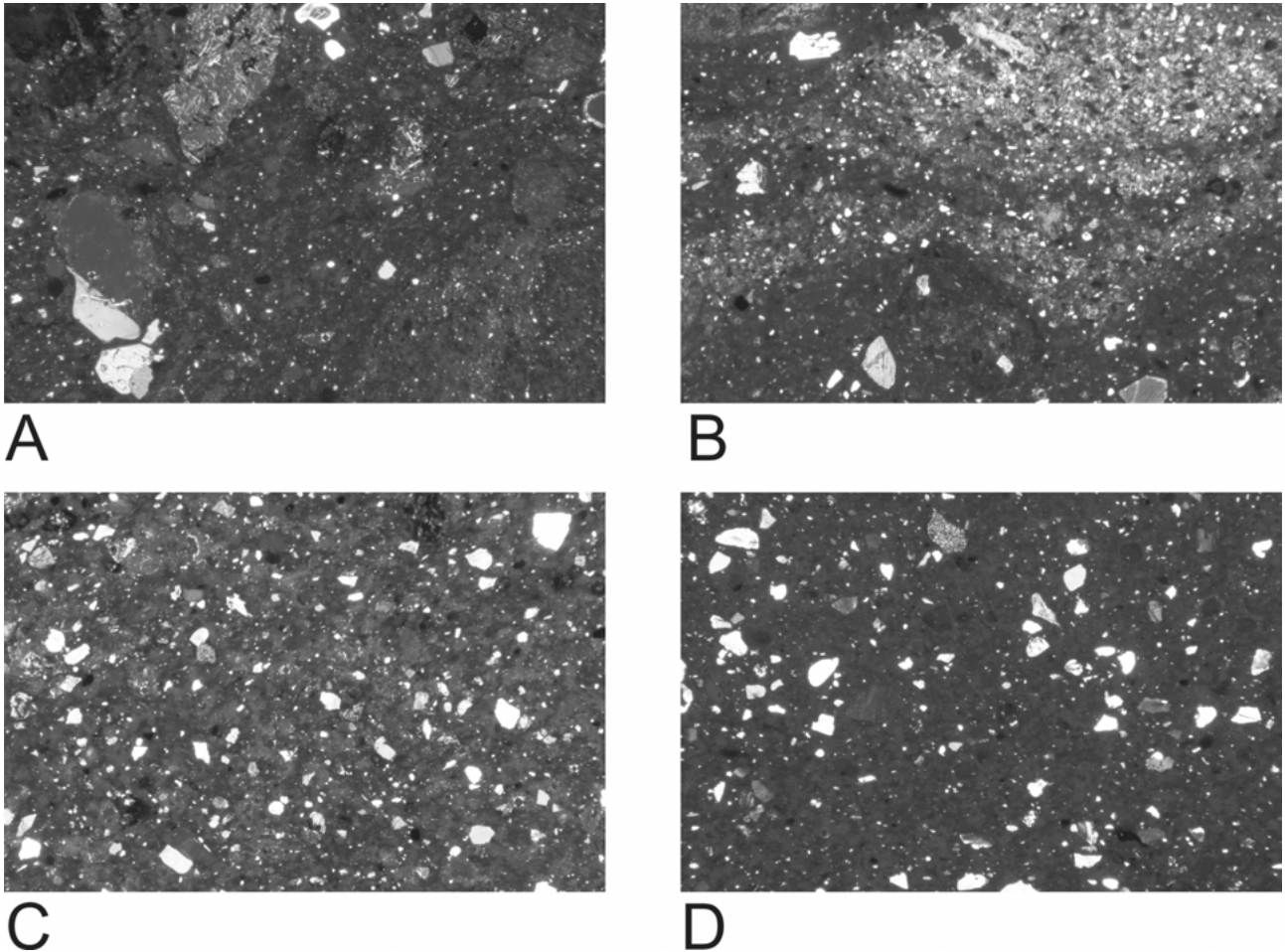


Fig. 4. Three different petrographic fabrics from *Forum Appii*: coarse fabric with sand-sized sanidine feldspar, mono-crystalline quartz and augite inclusions (**fig. 4a**), heterogeneous red firing clay mixed with light-coloured clay with silt-sized quartz inclusions (**fig. 4b**), fine fabric with well-sorted mono-crystalline quartz, sanidine feldspar and augite (< 1 mm) in a red firing clay (**fig. 4c**). One petrographic fabric from *Ad Medias*: fine fabric well-sorted quartz and sanidine feldspar inclusions (< 0.5 mm) in a red firing clay (**fig. 4d**). Width of individual images = 3.8 mm.

clay (**fig. 4d**). Whilst this fabric is similar to the one used by potters at *Forum Appii*, the difference is that it does not contain augite and zeolite inclusions. The waster fragments have been partially reduced (for instance, on one side), or are deep grey as the result of over-firing.

Site 12317

The fragmentary nature of the *dolia* sherds produced at the small site does not allow us to reconstruct the forming technique of this type of vessel.¹² However, the wall fragments are up to 5.5 cm thick, which suggests that they were handmade with either slabs or coils. A typical rim has not been identified among the collected wasters.¹³ The fabric is characterized by sand-sized sub-angular augite, leucite, quartz (1.5 mm) and rounded iron-manganese inclusions (2–2.5 mm) in a red

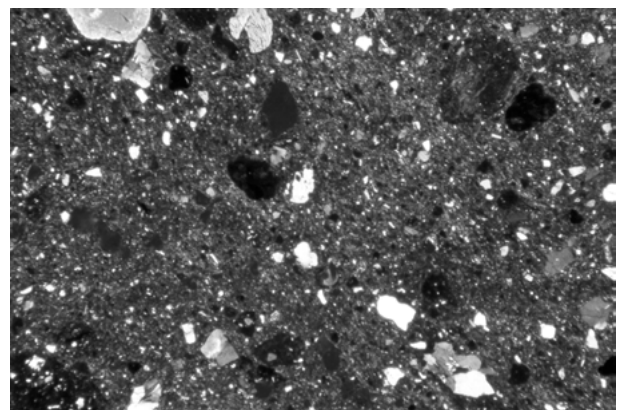


Fig. 5. Petrographic fabric of a *dolium* from rural site 12317: sand-sized augite, leucite, quartz (1.5 mm) and rounded iron-manganese inclusions (2–2.5 mm) in a red firing clay with fine biotite inclusions. Width of individual image = 3.8 mm.

¹² Different techniques have been identified for the manufacture of *dolia* in antiquity, including slab or coil building and wheel throwing (GIANNPOULOU 2010, 66–72).

¹³ DE HAAS 2011, 99 fig. 4,26; TOL/DE HAAS 2013, 155 fig. 11.

firing clay with fine biotite inclusions (**fig. 5**). It is likely that the augite and leucite inclusions were added as temper, and typical wasters are over-fired.

Discussion

This paper focused on the evidence for local pottery production at *Forum Appii*, *Ad Medias* and the small site 12317 in the Pontine plain. Geophysical research and field surveys at the aforementioned sites indicated that they were places where pottery production took place during the late 2nd or 1st century BC. The relation between the results of the geophysical surveys and the surface finds is still poorly understood at present. However, on the basis of the evidence gathered so far, it might be conjectured that the location and layout of the facilities related to potting activities at the sites suggest that there were differences in size and scale of pottery production. With regards to the size of pottery production, *Forum Appii* would appear to have been a centre of craft production, given that seven (and possibly eight) kilns were identified, whereas no other structures were identified at the small rural site, apart from one kiln and associated clay pits. Both sites were located near ancient canals, which would have facilitated water transport. Nevertheless, the possible harbour at *Forum Appii*, suggested by historical sources, hints at the site's potential of social control.¹⁴

As for the scale of pottery production, it might be conjectured that production at *Forum Appii* was comparatively large. This is not only suggested by the number of kilns identified at the site, but also by their configuration. Three (and possibly four) kilns were individual structures, whereas four kilns were grouped in clusters of two each. Interestingly, ethnographic research has shown that potters, firing their pottery in clustered kilns, would fire their pottery alternately, so that one load was heating or cooling while the other was being prepared for the firing process.¹⁵ Certainly, this can be interpreted as a more efficient and cost-effective way of pottery production, allowing potters to produce more pottery in any given time.

Potters working at the sites of *Forum Appii* and *Ad Medias* manufactured ceramic building materials and amphorae. The fabric analysis of the pottery wasters at both sites suggests that potters sourced a similar red firing clay deposit for the production of these wares. Following on from this, it might be suggested that the potters working at these sites may have collaborated for the sourcing and collection of the raw materials. Certainly, the location of both sites on the *Via Appia* and the *Decennovium* canal would have facilitated the transport and delivery of materials, and collaboration may have been in their interest. Nevertheless, it should be noted that there are some differences between the fabrics at the two sites, and more specifically in the coarse inclusions. For instance, the fabrics at *Forum Appii* are characterised by coarse sub-rounded augite and zeolite inclusions, but these diagnostic inclusions do not seem to be present in the fabrics from *Ad Medias*. This might be related to different technological traditions of the potters.

As for the *dolia*, produced at site 12317, potters seem to have used a pottery also seem to have used a similar red firing clay. However, the technological traditions of these potters would appear to be considerably different, given that they used different forming techniques. Nevertheless, all the potters, working at the three production sites in the Pontine region, used a similar firing technology, since they fired their various products in oxidising atmosphere.

In order to confirm whether potters in the Pontine plain used local clay sources, the results of the ceramic thin section analysis will need to be compared with the geological sources, which have been collected during the clay prospection campaign in the area. We will focus on this aspect in the next phase of the project and these results will be published in the final synthesis of the project.

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¹⁴ GRAHAM 2005, 106–125.

¹⁵ RYE/EVANS 1976, 88. Similarly, this organization of pottery production in the Roman era has been identified at the sites of Sagalassos (MURPHY/POBLOME 2011), and Vervoz (BORGERS ET AL. 2013).

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