

# THE MAIN ‘MIDDLE BYZANTINE PRODUCTION’ AND POTTERY MANUFACTURE IN THEBES AND CHALCIS

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*The article relates the results of archaeometric and archaeological investigations of the relationships between some well-known types of Byzantine table wares and pottery manufacture in Thebes and Chalcis, focusing on the period from the twelfth to the fourteenth centuries AD.*

*We currently accept that several twelfth–thirteenth century types, such as ‘Green and Brown Painted Ware’, ‘Fine Sgraffito Ware’ and ‘Aegean Ware’, form part of a single, main, long-lasting production of Byzantine ceramics, called here main ‘Middle Byzantine Production’ (MBP), which was distributed and diffused in the whole Mediterranean area, and especially in its eastern part. The discovery of kiln furniture and pottery wasters in rescue excavations in Thebes and Chalcis gave the opportunity to define chemical reference groups for the two cities, and to test the hypothesis of a potential origin of the MBP in Central Greece. The results point to Chalcis, then the harbour of wealthy Thebes with a strategic location on maritime trade routes, as the place of manufacture of the MBP. Chalcis, which is now seen as a main pottery production site, is envisaged within its historic context. The persistence of the MBP after the Frankish conquest, without noticeable morphological changes, questions the impact of this conquest on both trade networks and dining habits.*

*The political fragmentation of the thirteenth century gradually changed the conditions that facilitated the predominance of the MBP, and led to the establishment of a number of regional workshops whose ceramics were mainly destined to cover local markets. While continuing earlier techniques, they introduced new types, prominent among which was the ‘Sgraffito with Concentric Circles’ (previously related to ‘Zeuxippus Ware’). Thebes was one of these new workshops probably appearing from the mid-thirteenth century and continuing at least to the early fourteenth century. Chalcis eventually followed the same course, and its production may have carried on well into the Ottoman period.*

## INTRODUCTION

Publications of pottery from various excavations in the Mediterranean area and the Black Sea have defined several categories of glazed pottery (based primarily on their decoration techniques), which co-existed or followed each other during the twelfth and the thirteenth century. Much of the terminology used for this group of wares (Slip-Painted, Green and Brown Painted, Fine Sgraffito, Painted Sgraffito, Incised Sgraffito, Champlévé, Plain Glazed) still relies on C. Morgan’s pioneer publication of the Byzantine pottery of Corinth in the 1940s (Morgan 1942; see also Vroom 2003; Waksman and Wartburg 2006). Part of Morgan’s Incised Ware falls in the group later distinguished by A.H.S Megaw as ‘Aegean Ware’ (suggesting an Aegean provenance), which he dated in the early thirteenth century (Megaw 1975). The chronology of these different types of pottery was revised by G.D.R. Sanders, who provided a new typo-chronology of reference for them from the beginning of the twelfth until the mid-thirteenth century (Sanders 1995; 1999; 2000; 2003).<sup>1</sup> Closed deposits from other excavations, such as the Saraçhane excavation in Istanbul (Hayes 1992) and the Palaion Demarcheion site in Cyprus (Violaris 2004; Wartburg and Violaris 2009) support Sanders’ chronology. The later periods are less well documented, but we now know that some of the types may be found until the beginning of the fourteenth century, as shown at Kinet Höyük (Blackman and Redford 2005, 88, 96).

The importance of these categories of mainly twelfth–thirteenth century glazed pottery is accentuated by their wide diffusion, which includes major sites, especially harbours, from

<sup>1</sup> Some of the types occur in Corinth until the 3rd quarter of the 13th century (G. Sanders pers. comm.).

southern France to Israel and from Chersonesos to Paphos (Vallauri and Démians d'Archimbaud 2003; Boas 1994; Romancuk 2003; Megaw 1975; François 1997, 233–4). However, the quantities found at all these sites may not have been substantial,<sup>2</sup> with larger concentrations appearing in the Aegean, for instance at Corinth (Sanders 1995) or Kadıkalesi/Anaia (Mercangöz 2013b, 38–54). Such pottery has also been located in rural sites of Central Greece (Armstrong 1989; Vroom 2003, 145–64) and the Frankish Levant (Stern and Tatcher 2009). But the most striking point is its presence in shipwrecks. In the Aegean, Eastern Mediterranean and the Black Sea, we are currently aware of a handful of shipwrecks dated back to the twelfth–thirteenth century which carried significant quantities of table wares. Most of them were located in the Aegean and off the coast of Lycia (in Pelagonnisos–Alonnisos, Kastellorizo, Skopelos and Adrasan, plus a recently discovered one in Kavalliani)<sup>3</sup> and, significantly, the cargoes of all except only the Black Sea shipwreck (Novy Svet) may have consisted mainly of these twelfth–thirteenth century categories (Kritzas 1971; Michailidou and Philotheou 1989; Armstrong 1991; Zelenko 1999; Papanikola-Bakirtzis 1999; Doğer 2000; Koutsouflakis *et al.* 2012; Doğer and Özda forthcoming).<sup>4</sup>

In recent years, the origin of these ceramics has been a major issue for laboratory investigations. As already suggested by previous studies (*e.g.* Armstrong 1989; Boas 1994; Sanders 1995; Blackman and Redford 2005), the results of chemical analysis based on samples of twelfth–thirteenth century Glazed Wares from various sites – including Kouklia and Paphos in Cyprus, Chersonesos in the Crimea, Tell Arqa in Lebanon and Pergamon in Turkey – definitively proved that samples of all these widely distributed pottery types belonged to a single chemical group and should be seen as a single, varied and long-lasting production.<sup>5</sup> This indicated a common origin and pointed to the existence of a workshop, or group of workshops, located in the same geological region, which distributed its products around the Mediterranean and the Black Sea (Waksman and Wartburg 2006). Research into the area of manufacture of this main 'Middle Byzantine production', tentatively abbreviated here as MBP, was directed towards a number of sites.<sup>6</sup>

Cyprus was either proposed (Lapithos, see Boas 1994) or suggested (Famagusta, see Blackman and Redford 2005) as a potential origin, but further research either rejected or could not substantiate these hypotheses (Waksman and Wartburg 2006). Another major result was to rule out Corinth, well known both as a production site and as a place where MBP was found in large quantities (Megaw and Jones 1983; White, Jackson and Sanders 2006). Less well known, the castle of Kadıkalesi/Anaia in Western Turkey was also recently considered as a potential manufacturing place, but the case was similarly dismissed (Waksman 2013, 110). These results left open the question of MBP origin in other possible production areas that have been proposed, especially the Aegean (Megaw 1975) and Central Greece (Waksman and Wartburg 2006, 382; White 2009, 157–8). More than its presence in cities of Central Greece (for Thebes, see Armstrong 1993; Vroom 2006; for Chalcis, see Georgopoulou-Meladini 1973–4, 503–4; Papadakis 1975, 294–304, figs. 4–13), it is the abundance of MBP in rural sites as shown by surveys (Armstrong 1989; Vroom 2003; Papanikola-Bakirtzis 1999, 32, 42 nos. 11, 26) which attracted our attention to the region of Thebes. All types mentioned above were represented in survey material, a clue which may indicate the proximity of workshops. Thebes, being the regional capital, could have functioned, in relation to the port of Chalcis, as the main centre for both ceramic production and distribution.

<sup>2</sup> Byzantine pottery is still seldom quantified in excavations; it is thus difficult to reason in terms of quantities.

<sup>3</sup> We would like to thank C. Agourides and C. Papadopoulou for mentioning this shipwreck to us. We are grateful to G. Koutsouflakis, director of the underwater survey, for his kind offer to collaborate on further studies.

<sup>4</sup> Unfortunately, several of these shipwrecks are known only from looted material and not from excavations.

<sup>5</sup> A noticeable exception was an isolated example of 'Aegean Ware' from the shipwreck of Çamaltı Burnu (Günsenin 2003), which was later attributed to the workshops of Istanbul Sirkeci (Waksman, Erhan and Eskalen 2009).

<sup>6</sup> Although this production continues to occur under Frankish rule in previously Byzantine territories well into the thirteenth century (*e.g.* Corinth, see Sanders 1995; 2000; 2003), all types included in this generic term are well established during the Middle Byzantine period. The abbreviation MBP was suggested by G. Sanders, to whom S.Y. Waksman is grateful for fruitful and stimulating discussions.

The opportunity to investigate our hypothesis came from rescue excavations in Thebes and Chalcis. More specifically, the research focused on chemical analysis of *c.*80 samples, which derive from documented stratigraphic contexts in both cities. In this sense, they can be considered as reliable archaeological data. The selected contexts included evidence for pottery manufacture, consisting of kiln furniture (tripod stilts) and pottery wasters. Although the latter were typologically unrelated to MBP, they enabled us to constitute chemical reference groups for Thebes and Chalcis and to test, through the comparison with MBP examples, the hypothesis of MBP manufacture in one of these cities. In general, the study was expected to extend our knowledge of the local pottery repertoire of Thebes and Chalcis in the Medieval and post-Medieval periods.

#### THEBES AND CHALCIS IN THE TWELFTH AND THE THIRTEENTH–FOURTEENTH CENTURIES

The attempt to recreate a picture for the cities of Thebes and Chalcis during the Byzantine and Frankish periods has already been made by recent research (Louvi-Kizi 2002; Koilakou 2013; Kontogiannis 2012a). This was based on combining the meagre written and archival records with the material evidence coming mainly from rescue excavations from the second half of the twentieth century onwards.

The twelfth century emerges as a period of relative stability and prosperity for eastern Central Greece, despite the Norman raids of 1147/8. Thebes, being the administrative and military capital of the Theme of Hellas from the ninth century onwards, was clearly the largest population centre of the province. The city lay on the land road that connected Corinth and Athens to the south with Thessaloniki and Constantinople to the north. The original nucleus situated on the Kadmeia hill was surrounded by a constantly repaired enclosure, which followed the trace of earlier fortifications going back to Mycenaean times (Fig. 1). The city had clearly expanded from the early eleventh century with unprotected suburbs developing on the foothills around Kadmeia, each with its own grid of streets, religious epicentre and graveyard. The population comprised a variety of craftsmen and merchants, among whom one could count those dealing with the production of silk fabrics and architectural sculpture (Jacoby 1991/2, 466–8; Koilakou 2004; Koilakou 2013, 183–6), the members of the local landed aristocracy of the province (a situation presented in the slightly earlier – end of eleventh century – cadaster of Thebes), military personnel and administrators, both ecclesiastics and civilians (such as *vasilikos kandidatos* Vasileios and bishop Ioannes Kaloktenis), and a considerable Jewish community (Koilakou 2011). The city served as the financial, commercial and crafts centre of a rich agricultural countryside, an image further accentuated by the rising numismatic circulation as documented from the early tenth century onwards (Harvey 1982/3, 21–8; Gerolymatou 1987, 102–5; Galani-Krikou 1998, 158–161).

Chalcis (known as Euripos, Fig. 2), on the other hand, is much less documented and its role within the Byzantine administrative system is little known. It is usually accepted that the city served as the station for the Theme's flotilla and its port authorities, being the physical port of call in the Aegean for nearby Thebes (Koder and Hild 1976, 156; Triantafyllopoulos 1990, 170; Georgopoulou 2001, 73). This is a settlement that was founded anew during the Middle Byzantine period, transferred here from its ancient location for reasons related to the control of naval circulation. The overall image is that of a provincial town, a dense fortified settlement with houses, streets and churches composing a typical Medieval pattern whose earlier structures were dated to the ninth–eleventh centuries. Isolated installations and cemeteries were located beyond the walls. The amount and quality of material evidence show that this was a provincial centre of a certain standing in the commercial and cultural life of Byzantine Greece.

The thirteenth and fourteenth centuries are seen as periods of fragmentation, disruption and constant upheaval, following the dismantlement of the empire, the settlement of a variety of rulers and the constant conflicts that erupted between them. However in Central Greece, both the historic and archaeological record show a relatively unopposed transition of power from the



Fig. 1. Plan of Thebes with the Kadmeia hill, indicating the position of Panagiotara Plot in 13 Poulipoulou Street (1).

Byzantine administration to the feudal government, including the brief Sgouros regime interlude which usually goes unnoticed.

Thebes retained its role of provincial administrative centre, becoming capital of the Duchy of Athens and seat of a Latin archbishop. The end of the thirteenth century represents an apogee of prosperity reflected in the texts relating the construction of the Saint Omer castle within Kadmeia, apparently the largest alteration to the civic fabric (*The Chronicle of Morea*, vv. 8080–92; Koilakou 2013, 187; Fig. 1). Its supposed remnant, the tower in the courtyard of the modern Museum, clearly reflects the aspirations and potential of those who commissioned the project. The fourteenth century saw the establishment of Catalan rule in Boeotia. Thebes became the seat both of a new administration and of an incoming population that settled within the walls and soon entangled itself in domestic struggles. However, this new social reality, though perhaps identifiable in the defensive patterns that developed in the countryside of Boeotia (Kontogiannis 2012b, 80–90), has not yet been discerned in the archaeological record of the city itself. A continuity in both the size and the character of the settlement seems to occur from the

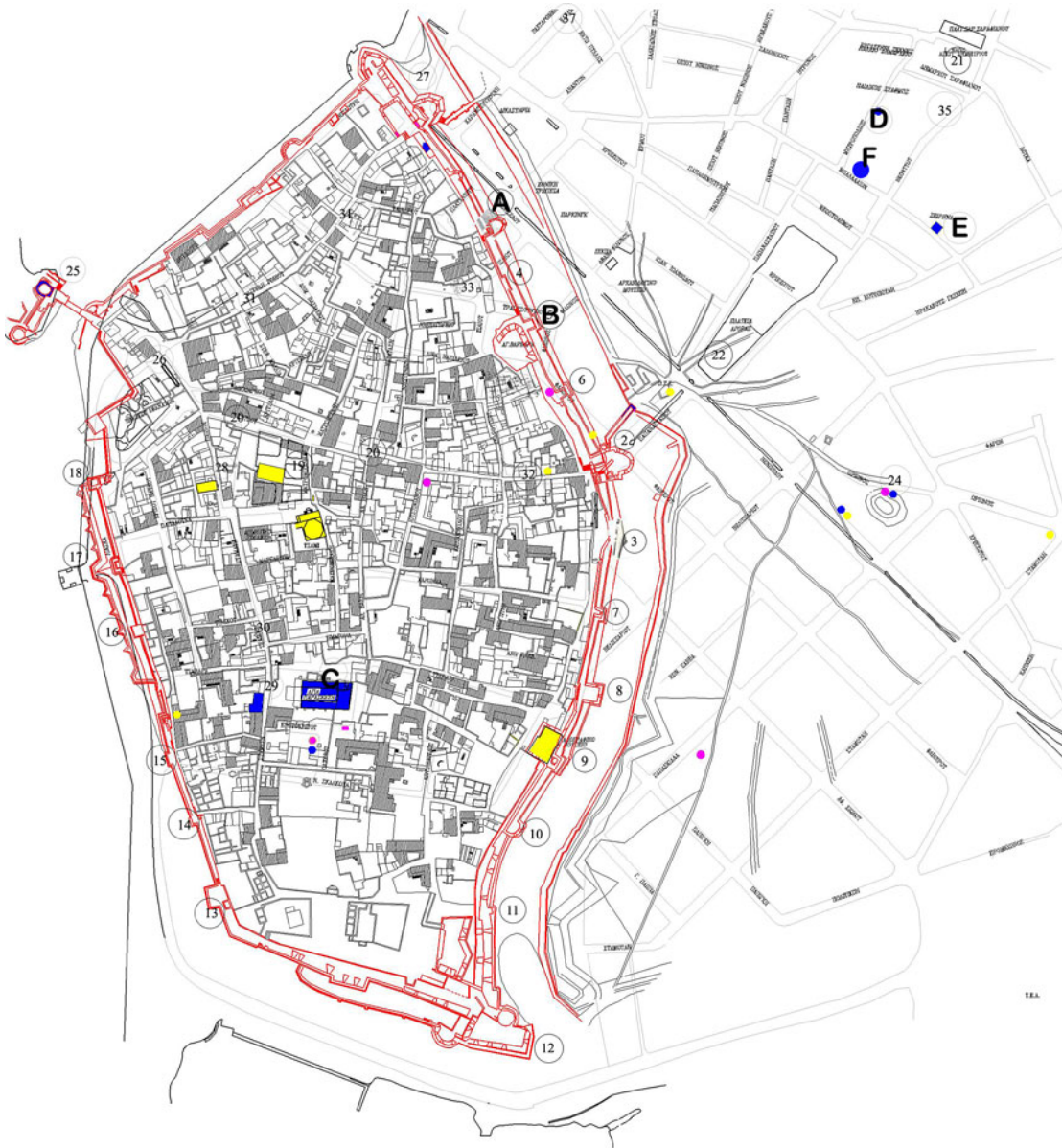


Fig. 2. Plan of Chalcis indicating the Medieval city and the monuments mentioned in the text. A: Epimelitirio Plot at Eleutheriou Venizelou Street; B: IKA plot at Agia Varvara Square; C: Agia Paraskevi, Erotokritou, Olynthou and Skalkota plot; D: 9 Mitropoleos Street plot; E: Seirina Tower; F: 33 Balalaion Street plot.

Burgundian rule to the Catalans and the Florentines who succeeded them at the end of the fourteenth century, with some of the suburbs being abandoned in one period or another. The city retained its famous manufacture of silk products, which were now shipped to distant markets from ports such as Livadostra in the Corinthian Gulf (Dunn 2006, 58–9).

Lombard and Venetian Chalcis (then known as Negroponte), on the other hand, was gradually turned into an international outpost that played a key role in the Aegean politics of the time. Despite the fact that the previous fortification was retained, there was a dynamic change both within and outside the walls (Fig. 2). Within the walls there is evidence of an intense building activity, both of civic structures, such as the surviving Agia Paraskevi Basilica (Fig. 2.C), and of military ones, *i.e.* the curtain wall dividing the Venetian from the Lombard quarters. Outside the

walls, a series of suburbs were developed, which served a variety of settlers and purposes: the arsenal, the Jewish population, the artisans with their workshops, and, in times of danger, the refugees from the countryside seeking safety. The Venetian element that gradually expanded within the city, achieving control of the whole island of Euboea by the late fourteenth century, created a material culture of large aspirations, evident from the ceramics to the weapons, from the wall-paintings to the Gothic and Late Byzantine sculpture (Kontogiannis 2012a).

## EXCAVATION CONTEXTS

This study considered a selection of excavation contexts where samples indicative of pottery production were found. These correspond to rescue excavations located in areas outside the urban enclosures, both of Thebes and of Chalcis. In the latter case, a few more items were selected from excavations within the walls, as additional evidence.

### **Thebes, 13 Pouliopoulou Street** (Koilakou 2001–4, 35–6, figs. 12–13; Fig. 1.1)

Panagiotara plot in Pouliopoulou Street is located south-east of Kadmeia hill, its excavation comprising a large Middle Byzantine complex partly uncovered in 2003. During the Frankish period further sections were added to the east, south and north of the original core. At the south-west corner of the Middle Byzantine building a rubbish pit was excavated containing large quantities of tripod stilts (*c.*50) and unfinished pots, obviously rejected after initial firing. Although the kiln itself was not located within the plot limits, the contents of the pits are strong indications of a local production site.

### **Chalcis, *extra muros***

Two excavated plots (9 Mitropoleos Street and 33 Balalaion Street: Bedermacher-Geroussi 2012, 74–5) were located in neighbouring positions of a residential quarter. They are situated to the north-east of the Medieval city walls, an area corresponding to the suburbs of the Frankish/Venetian and the later Ottoman city, known in the sources as Borgo. It lay close to the port of Panagitsa (modern Souvala). The tower of Seirina, an Ottoman clock tower, is located *c.*50 m from the plots, indicating the limit of the city's market place during the Early Modern period (Fig. 2.E).

In 9 Mitropoleos Street (Fig. 2.D) the built structures were of poor quality, mainly dating from Late Ottoman times. However, six circular or oval rubbish pits carved into bedrock contained, among other things, large quantities of pottery, including a few tripod stilts. The bulk of the pottery belonged to the thirteenth and fourteenth centuries, with some random finds of the twelfth and the fifteenth centuries. Three of the rubbish pits also contained coins mainly dating from the thirteenth and the fourteenth centuries, confirming the main period of use.

In 33 Balalaion Street (Fig. 2.F) the excavated trenches revealed two main occupation layers: the earliest produced pottery that ranged from the late twelfth to the fourteenth century, and preserved few if any built structures apart from pipes carved in bedrock. The later layer included a part of a building complex, the pottery of which is dated to the Ottoman period. This is also the layer that produced a number of tripod stilts, and some fragments of over-fired pottery which could potentially correspond to wasters. Although it may not necessarily be the case (*e.g.* firing contexts), their association with tripod stilts supports this identification.

### **Chalcis, *intra muros***

In addition to the above contexts, and in the attempt to gain a more thorough picture for investigating potential pottery production in Chalcis, a small number of sherds was selected from five locations within the walls. These excavations produced twelfth–fourteenth century pottery, coming from types which are well represented in all excavations throughout the city.

The **Epimelitirio plot**, on the Eleutheriou Venizelou Avenue, revealed a stretch of the city's Medieval walls, excavated in 1964–5 (Lazaridis 1965, 294–6; Fig. 2.A) The most controversial point was the existence and dating of two parallel walls, built one next to the other. The first wall was initially dated either to the time of Justinian or to the time before the Frankish conquest, with the second wall attributed to the second half of the seventeenth century. We currently believe that both walls were integral parts of an urban enclosure that was continually reinforced and built upon in order to meet the challenges of military technology. The initial construction could be attributed to the early or mid-ninth century, when the city itself was erected. Phases of extensive repairs in the twelfth and the thirteenth centuries were documented, based on the bulk of pottery finds from all plots where parts of these walls were excavated. (Lazaridis 1965, 294–6; 1966, 236; Georgopoulou-Meladini 1973–4, 508; Papadakis 1975).

The excavation of **Agia Varvara Square** (IKA plot, Georgopoulou-Meladini 1973–4, 500–4; Fig. 2.B) produced building remains and finds belonging to four different chronological phases, indicating the continuous use of civic space throughout the ages. The earliest belonged to the ninth–tenth century, with a few coins going back to the seventh century. The second represents a long occupation period, from the eleventh–twelfth to the fourteenth–fifteenth centuries, with no visible interruption or destruction layer between them. The third phase was attributed to the Ottoman period, with the last one reaching Early Modern times.

The excavation at the junction of **Erotokritou, Olynthou and Skalkota Streets** (Toulitsi–Loumou–Loumaki plot, Bedermacher–Geroussi 2012, 74; Fig. 2.C), is situated next to the large Agia Paraskevi Basilica, and was excavated in 2009. It represents a well-documented case of the dating sequences observed in the city. The earliest phase, including part of a building complex and storage pits, is attributed to the Middle Byzantine period ranging from the tenth/eleventh to the twelfth century. The second one, being of Frankish/Venetian date, revealed various structures, a number of which may have functioned as burial areas probably linked to the nearby church. Others were identified as parts of the area's water supply/sewage system. The last phase was represented by an Ottoman house complex.

Finally, two tripod stilts were collected from trenches excavated in the course of public works for the installation of a modern sewage system along **Vaki and Charonda Streets** in 1996. Even though these streets probably coincided with the grid of the Medieval and Ottoman city, the finds were sporadic, since the trenches could not be extended beyond the limits of the works. Only a number of graves were recorded, along with ceramics and isolated architectural sculptures. Therefore, their context and the buildings they are related to were not investigated (Sapouna-Sakellaraki 1996, 287).

## SAMPLING

### Sampling selection

The samples fall into three main categories. The first one consists of sherds selected in order to define pottery production itself in Thebes and Chalcis, relying on undoubtedly local material. In Thebes, reference samples included both tripod stilts, used as separators between glazed ceramics during firing (catalogue nos. **1–2** BZY536–537), and unfinished, biscuit-fired, wares (catalogue nos. **3–6, 10–11, 13–15, 17** BZY492–496, 505–507, 509–510, Figs. 3b–h, 4a–c). The latter were chosen in order to represent a large variety of forms, especially of rims (Fig. 3). Another sherd, presenting a coloured surface but no glaze,<sup>7</sup> was also considered a waster (catalogue no. **16** BZY499, Fig. 3a).

Unfinished wares were not found in Chalcis, so in this case reference samples mainly consist of tripod stilts (catalogue nos. **46–47, 59–62, 71–73** BZY550–554, 563, 749–751, Fig. 5a–c). Several of them have fairly large dimensions, a feature usually related to the post-Byzantine period. One

<sup>7</sup> We were careful to distinguish examples which had not received any glaze (biscuit-fired sherds) from sherds whose glaze had flaked off.

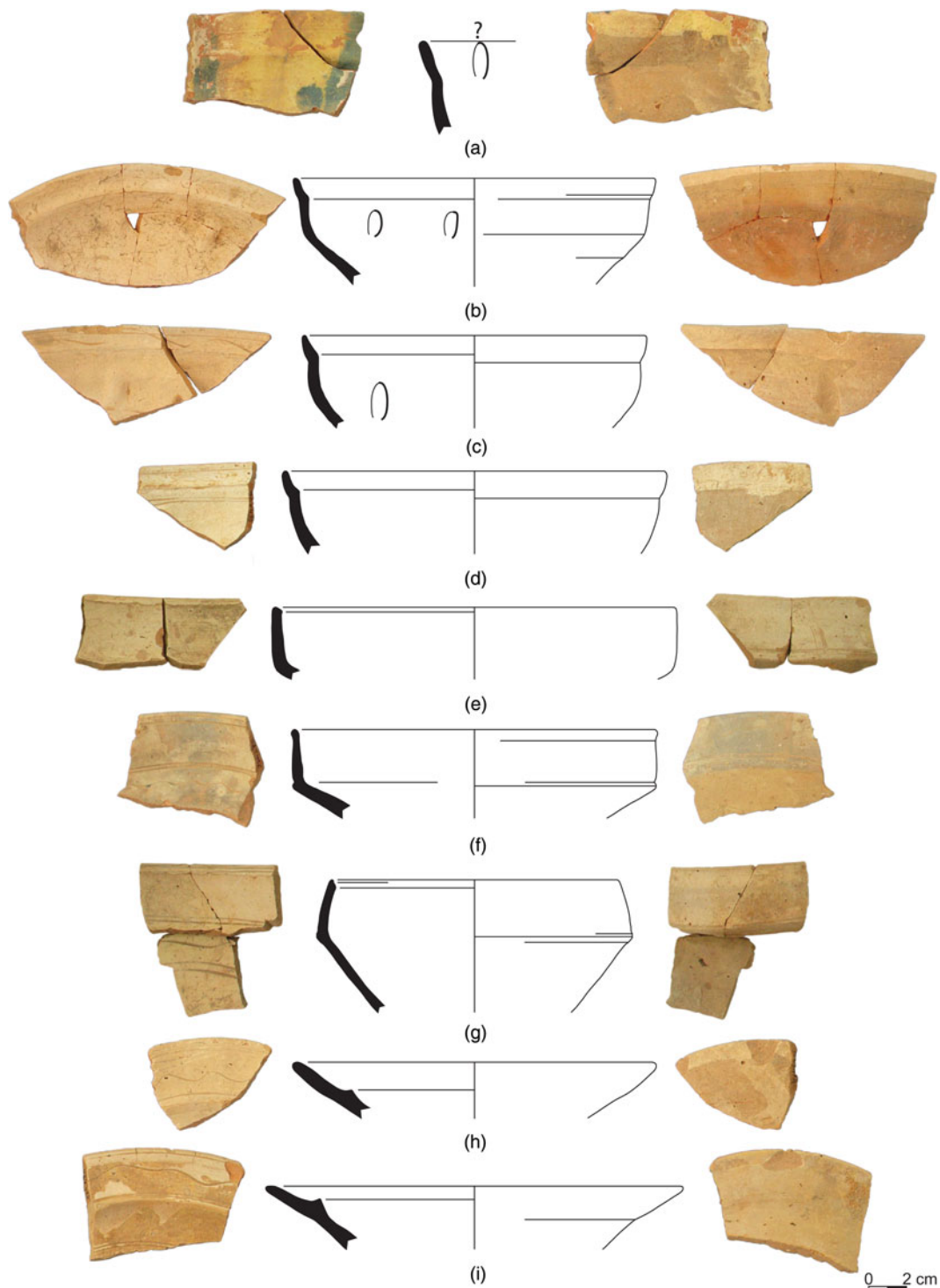


Fig. 3. Ceramics belonging to chemical group 'Thebes production': unfinished, biscuit-fired samples, taken as local references, and finished products. (a) Cat. no. **16** (BZY499); (b) Cat. no. **17** (BZY505); (c) Cat. no. **15** (BZY492); (d) Cat. no. **5** (BZY495); (e) Cat. no. **3** (BZY493); (f) Cat. no. **6** (BZY496); (g) Cat. no. **10** (BZY506); (h) Cat. no. **4** (BZY494); (i) Cat. no. **7** (BZY497).



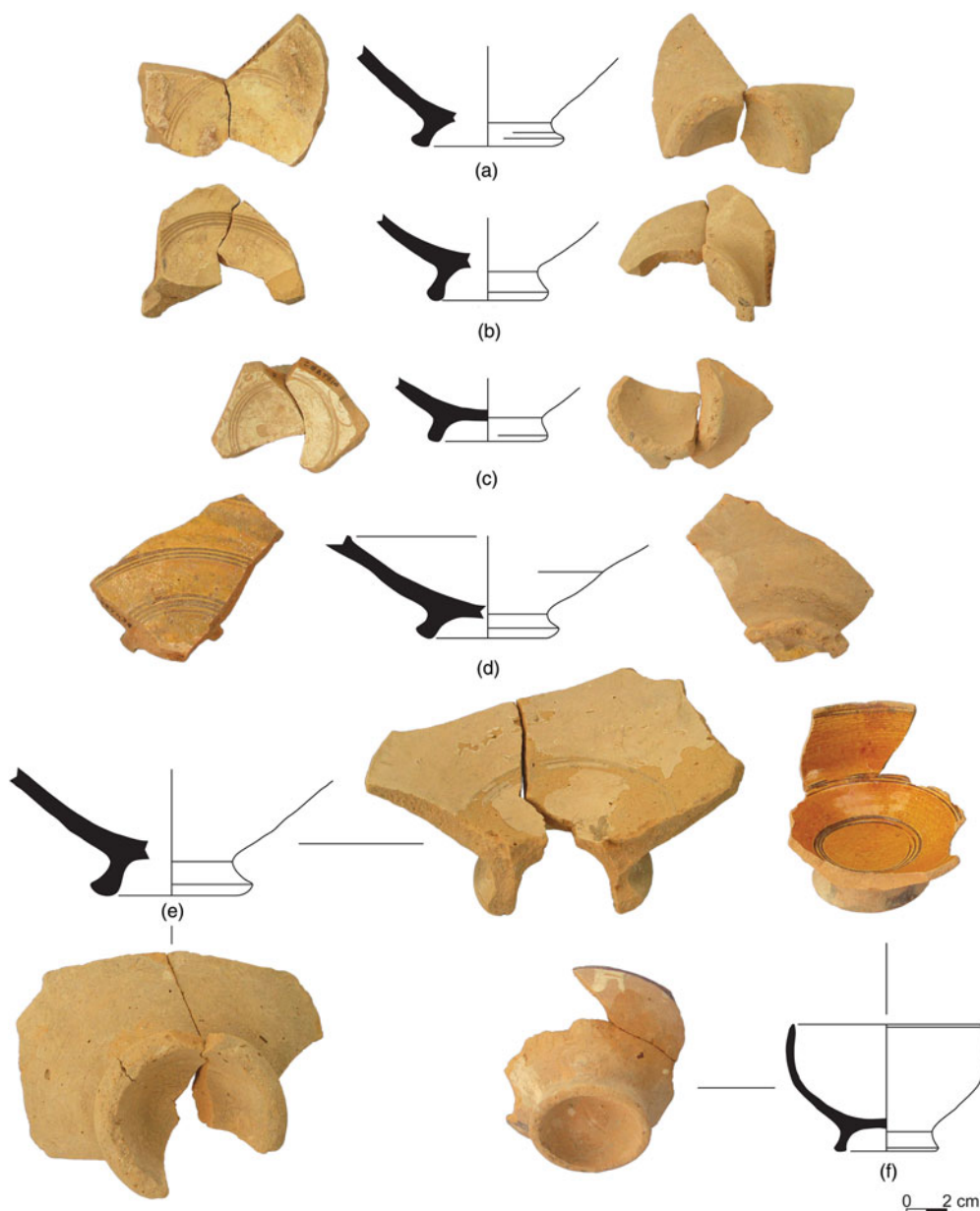


Fig. 4. Ceramics belonging to chemical group 'Thebes production': unfinished, biscuit-fired samples, taken as local references, and finished products. (a) Cat. no. **13** (BZY509); (b) Cat. no. **11** (BZY507); (c) Cat. no. **14** (BZY510); (d) Cat. no. **8** (BZY498); (e) Cat. no. **12** (BZY508); (f) Cat. no. **9** (BZY504).

misshapen over-fired sherd, possibly a rim of an unglazed closed form (jug?) (catalogue no. **63** BZY555, Fig. 5d), was also included as reference material for Chalcis.

The status of other sherds was more ambiguous. In Chalcis, partially glazed ceramics are common (catalogue nos. **56–8**, **67–8** BZY543, 547–548, 556–557, Figs. 6a–d, 7c), some very similar to fully glazed ones (*e.g.* compare catalogue no. **57** BZY547, Fig. 6a with catalogue no. **54** BZY539, Fig. 6e). The former were, however, not considered unfinished. On the one hand, several whole pots with similar decoration were uncovered in the Mitropoleos plot, and, on the other hand, a similar feature is observed, for instance, for Byzantine Glazed White Ware II (Hayes 1992; Waksman and Girgin 2008).

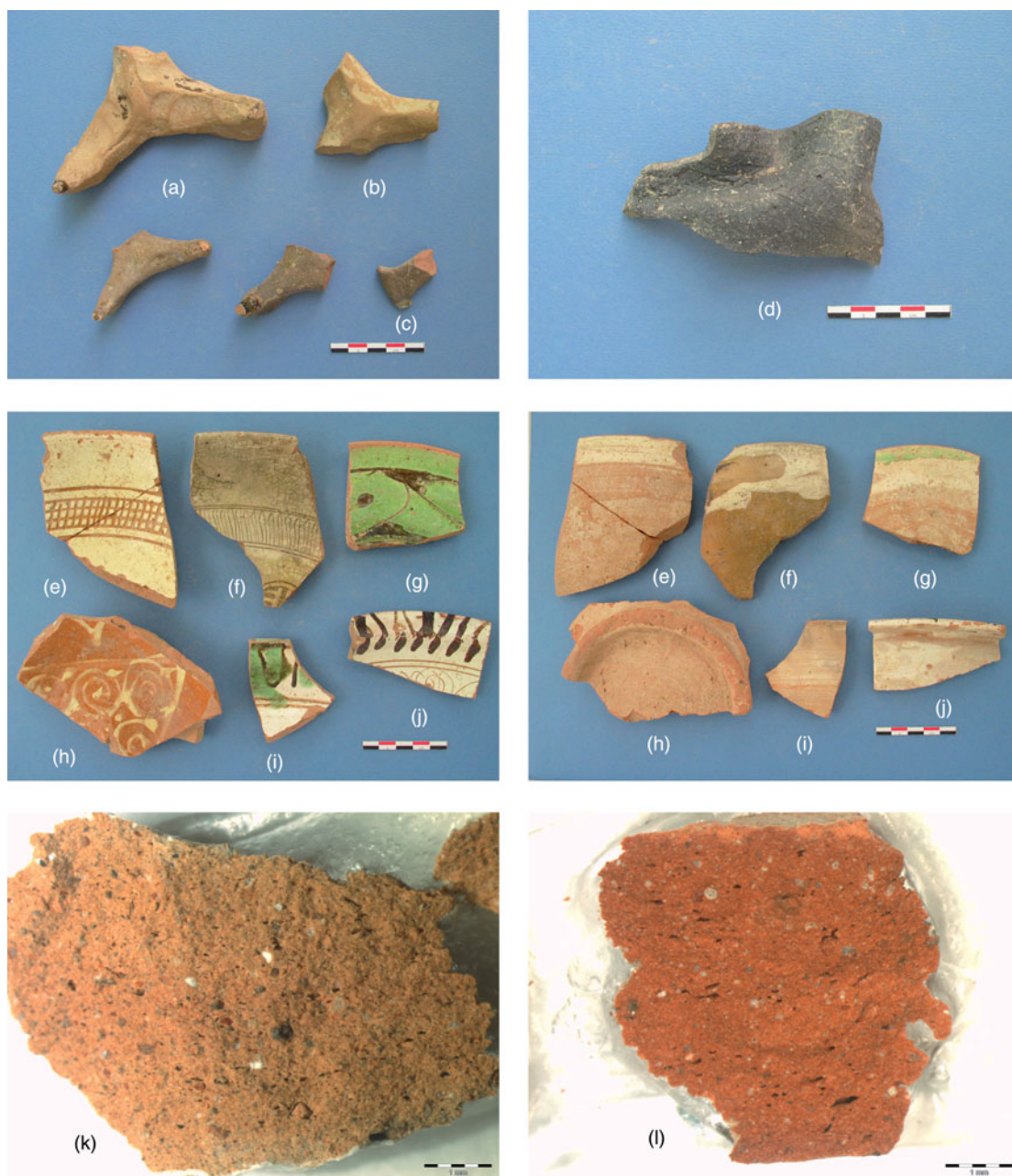


Fig. 5. Examples of samples analysed. Top: reference samples for Chalcis: tripod stilts: (a) Cat. no. **59** (BZY552); (b) Cat. no. **60** (BZY553); (c) Cat. no. **61** (BZY554); over-fired unglazed ware: (d) Cat. no. **63** (BZY555). Middle: examples of MBP, showing typical types and techniques of decoration and surface aspects of the reverse: (e) Cat. no. **38** (BZY530); (f) Cat. no. **39** (BZY534); (g) Cat. no. **41** (BZY526); (h) Cat. no. **19** (BZY520); (i) Cat. no. **21** (BZY511); (j) Cat. no. **30** (BZY533). Bottom: examples of fabrics under the binocular microscope (photos C. Brun), production of Thebes: (k) Cat. no. **5** (BZY495), and of Chalcis: (l) Cat. no. **31** (BZY512).

Next to local references and Partially Glazed Wares, we also included finished wares which either were similar in form and fabric to wasters (Thebes: catalogue nos. **7–8**, **12** BZY497–498, 508, Figs. 3*i*, 4*d–e*),<sup>8</sup> or were commonly found at the site and could possibly be local (Thebes:

<sup>8</sup> More complete examples will be on display in the Archaeological Museum of Thebes.

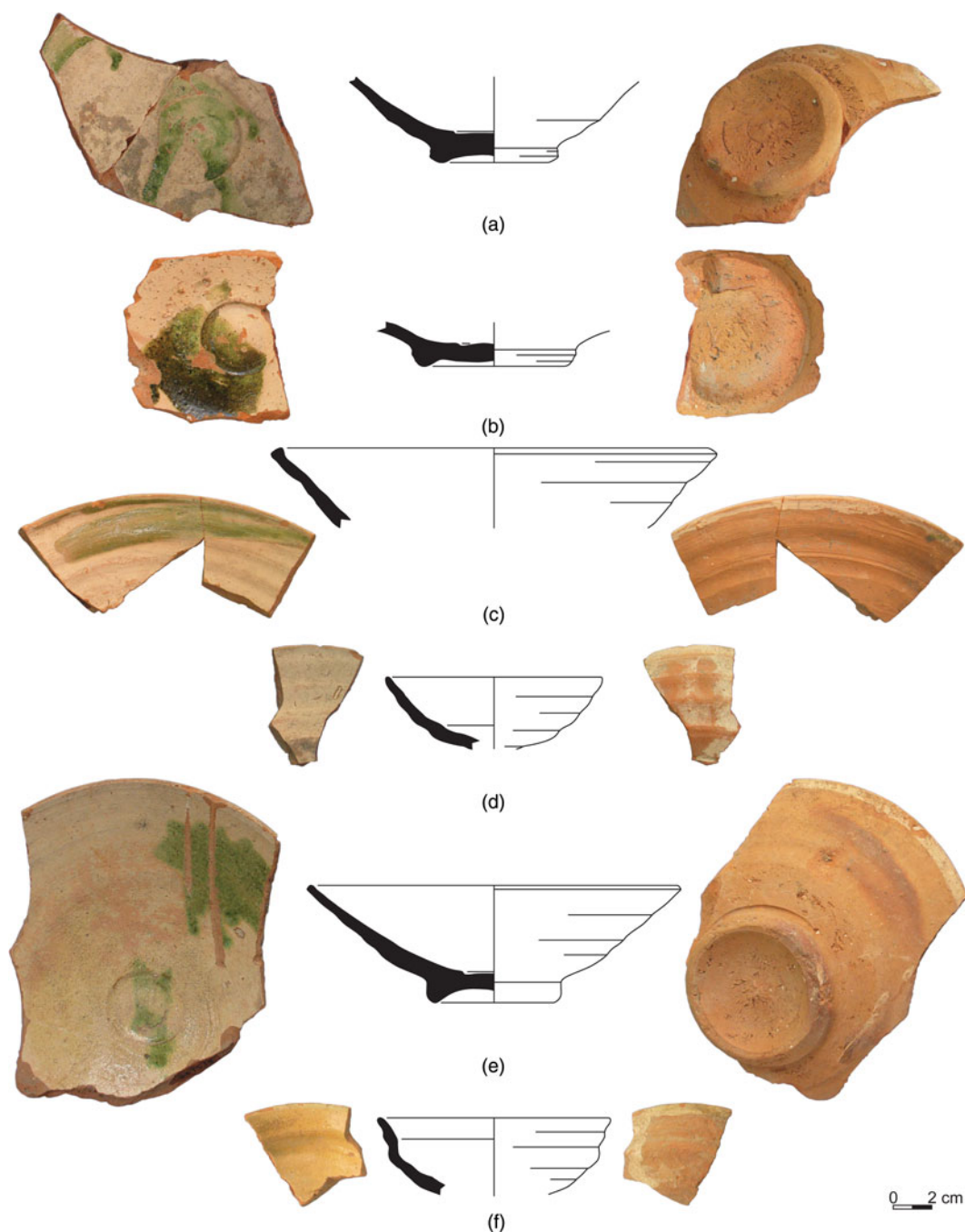


Fig. 6. Ceramics belonging to chemical group 'Chalcis production': Plain Glazed, Partially Glazed and Painted Wares. (a) Cat. no. **57** (BZY547); (b) Cat. no. **67** (BZY556); (c) Cat. no. **58** (BZY548); (d) Cat. no. **68** (BZY557); (e) Cat. no. **54** (BZY539); (f) Cat. no. **44** (BZY501).

catalogue no. **42** BZY500; Chalcis: catalogue nos. **53–55** BZY538–539, 541, [Figs. 6e, 7a–b](#)). These include Sgraffito with Concentric Circles, Monochrome Sgraffito, and Plain and Painted Glazed Wares, which date from the thirteenth and fourteenth centuries.

The second category of samples consisted of examples of MBP, with a selection covering a large part of its repertoire ([Figs. 5e–j, 8, 9, 10, 11, 12a–e](#)). MBP is present in impressive quantities in the



Fig. 7. Ceramics belonging to chemical group 'Chalcis production': Plain Glazed and Partially Glazed Wares. (a) Cat. no. **55** (BZY541); (b) Cat. no. **53** (BZY538); (c) Cat. no. **56** (BZY543).

contexts considered, in both Thebes and Chalcis.<sup>9</sup> The following types are represented in the sampling: Slip-Painted, Green and Brown Painted, Fine Sgraffito, Painted Sgraffito, Incised Sgraffito, Champlévé. Some of the types, especially Fine Sgraffito and Green and Brown

<sup>9</sup> They actually contrast with contexts previously published from Thebes (Armstrong 1993; Vroom 2006), where MBP was scarce.

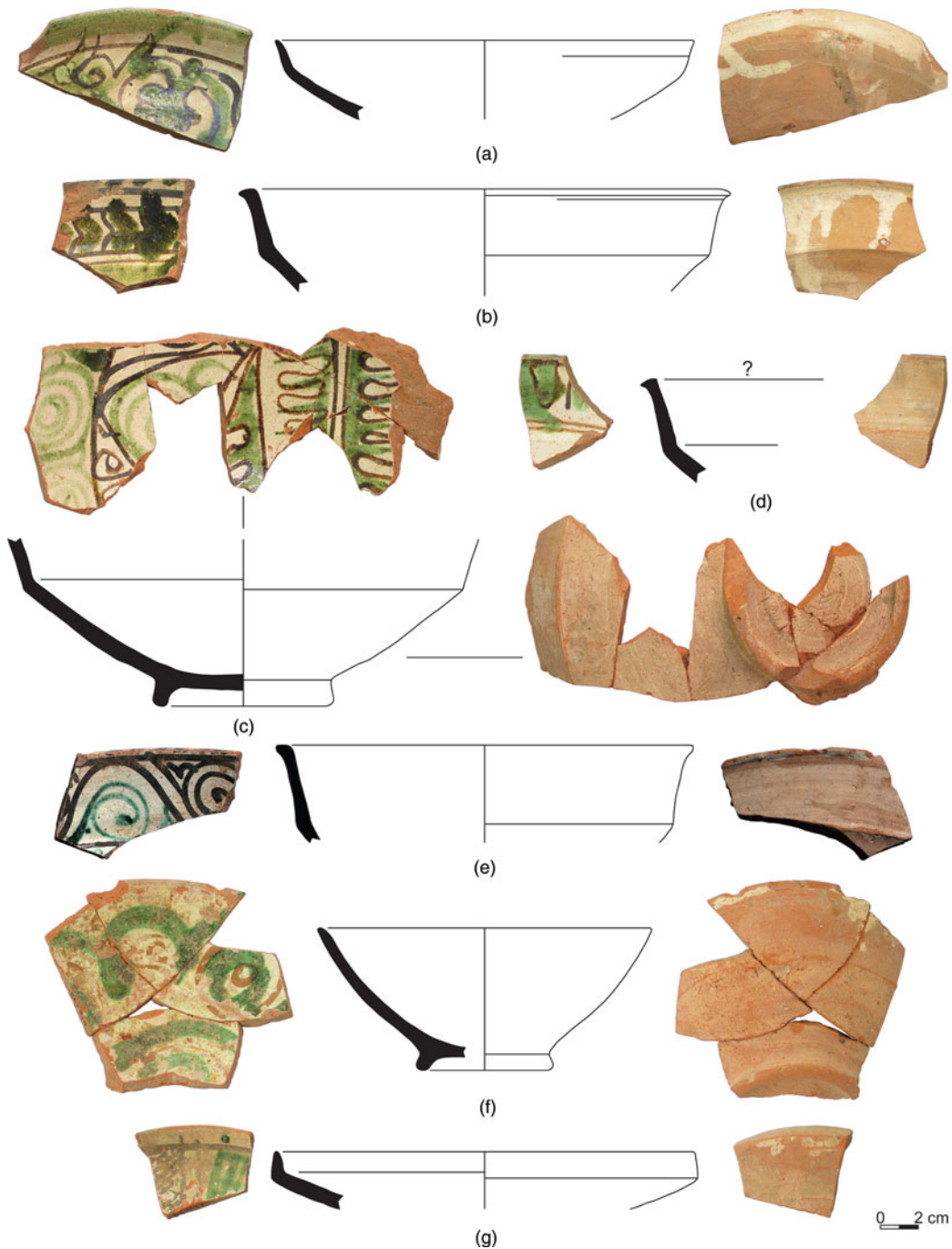


Fig. 8. Ceramics belonging to chemical group 'Chalcis production': MBP: Green and Brown Painted Wares. (a) Cat. no. **64** (BZY560); (b) Cat. no. **48** (BZY544); (c) Cat. no. **65** (BZY561); (d) Cat. no. **21** (BZY511); (e) Cat. no. **74** (BZY754); (f) Cat. no. **22** (BZY514); (g) Cat. no. **23** (BZY528).

Painted, show several variants. Others, like Champlevé, were present in lesser quantities. The dating of these sherds spreads from around the beginning of the twelfth to the mid-thirteenth century, according to Sanders' typo-chronology. Fig. 5 (middle right) shows typical aspects of reverses of MBP sherds: a thin wash usually covering most of the reverse, lime spalling being

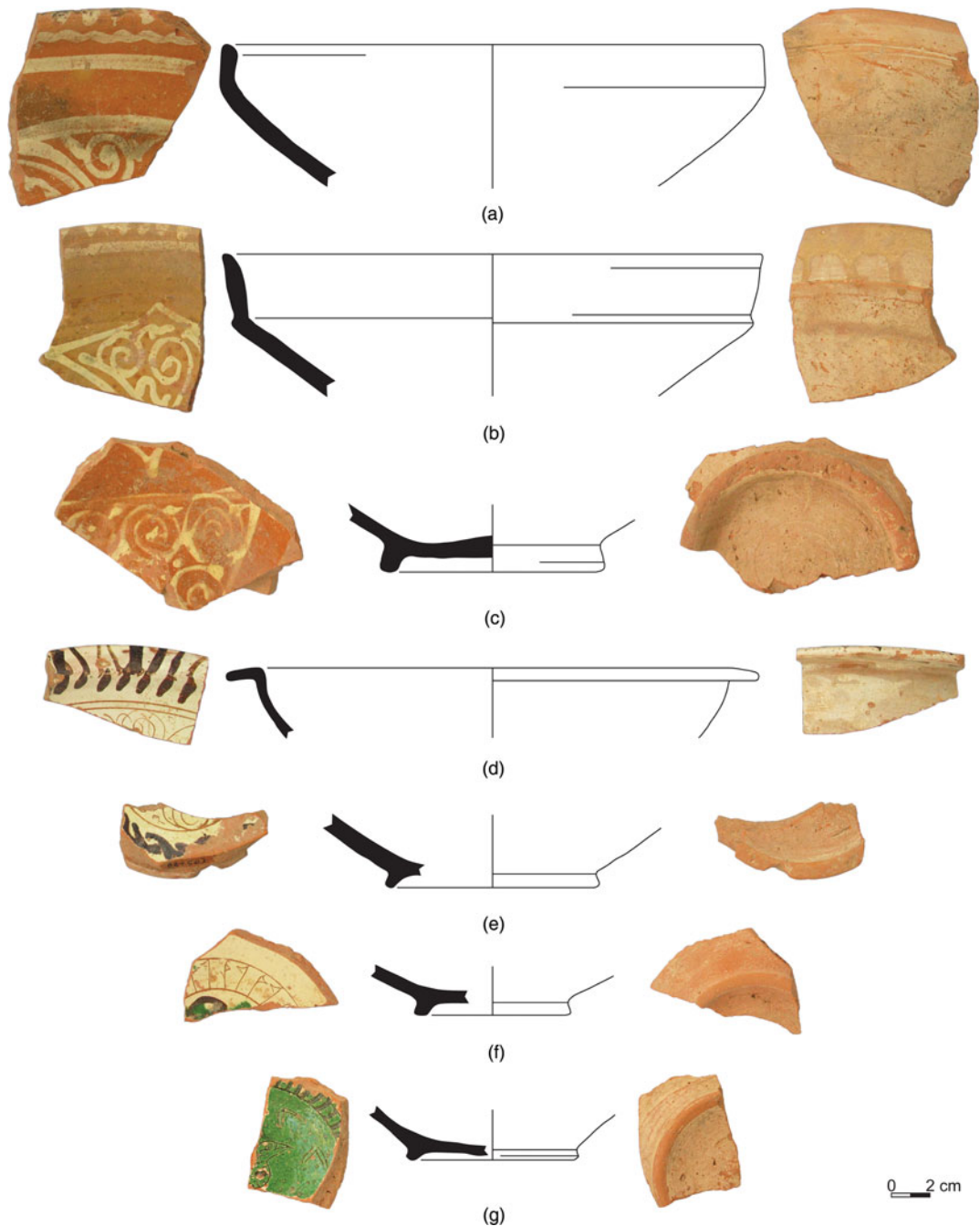


Fig. 9. Ceramics belonging to chemical group 'Chalcis production': MBP: Slip-Painted, Painted Sgraffito, Incised Sgraffito Wares. (a) Cat. no. **18** (BZY515); (b) Cat. no. **20** (BZY532); (c) Cat. no. **19** (BZY520); (d) Cat. no. **30** (BZY533); (e) Cat. no. **28** (BZY503); (f) Cat. no. **29** (BZY513); (g) Cat. no. **35** (BZY523).

frequently observed. A variant with glaze covering the whole reverse is also represented in the sampling (catalogue no. **49** BZY540, Fig. 12a).

A third group of samples, containing few additional sherds, does not enter the categories mentioned above, and is slightly later in date. Some were selected because they looked similar to wares previously studied in Lyon, for instance examples (catalogue no. **9** BZY504, Fig. 4f from

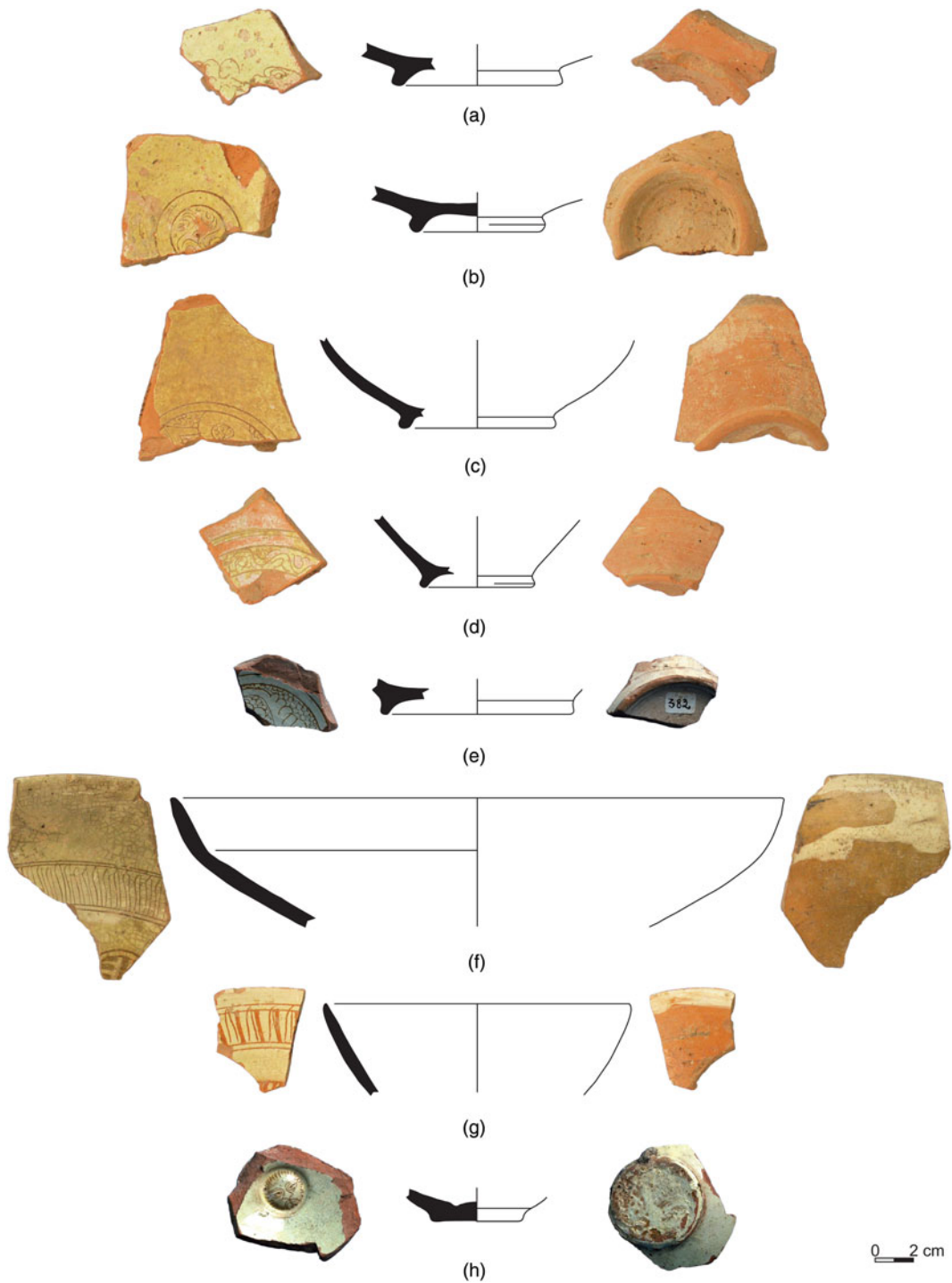


Fig. 10. Ceramics belonging to chemical group 'Chalcis production': MBP: Fine Sgraffito and Incised Sgraffito Wares. (a) Cat. no. 24 (BZY502); (b) Cat. no. 26 (BZY524); (c) Cat. no. 27 (BZY531); (d) Cat. no. 25 (BZY517); (e) Cat. no. 75 (BZY753); (f) Cat. no. 39 (BZY534); (g) Cat. no. 31 (BZY512); (h) Cat. no. 77 (BZY752).

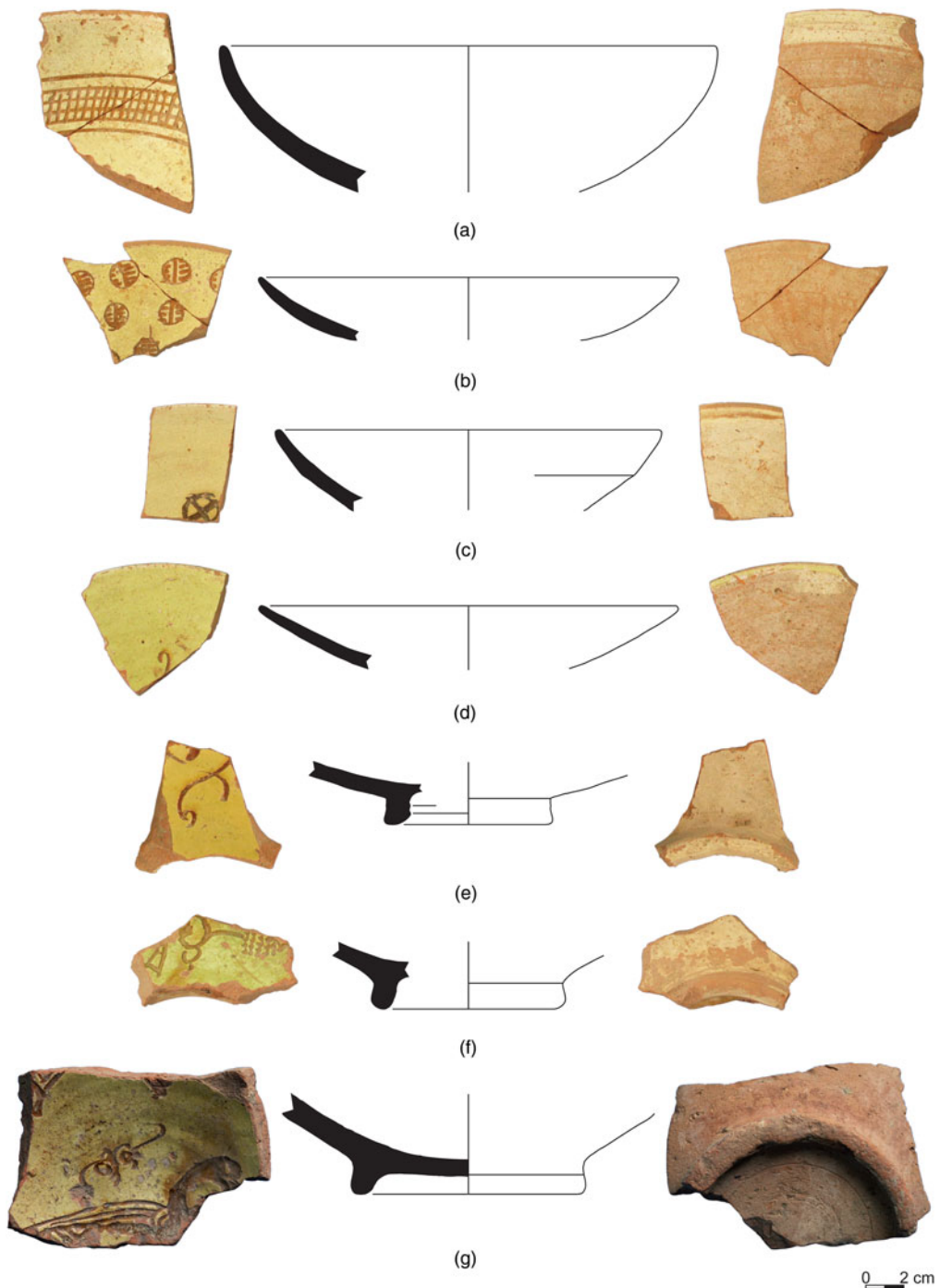


Fig. 11. Ceramics belonging to chemical group 'Chalcis production': MBP: Incised Sgraffito Wares. (a) Cat. no. 38 (BZY530); (b) Cat. no. 37 (BZY529); (c) Cat. no. 32 (BZY516); (d) Cat. no. 33 (BZY521); (e) Cat. no. 36 (BZY525); (f) Cat. no. 34 (BZY522); (g) Cat. no. 76 (BZY755).

Thebes; catalogue nos. 51–2, BZY546, 549 *Figs. 12h, 13d* from Chalcis) which recall the 'Novy Svet Ware' (Waksman and François 2004–5; Waksman and Teslenko 2010). This category also includes an example of Ottoman Sgraffito dating from the fifteenth–sixteenth century (catalogue no. 70 BZY558, *Fig. 12g*).



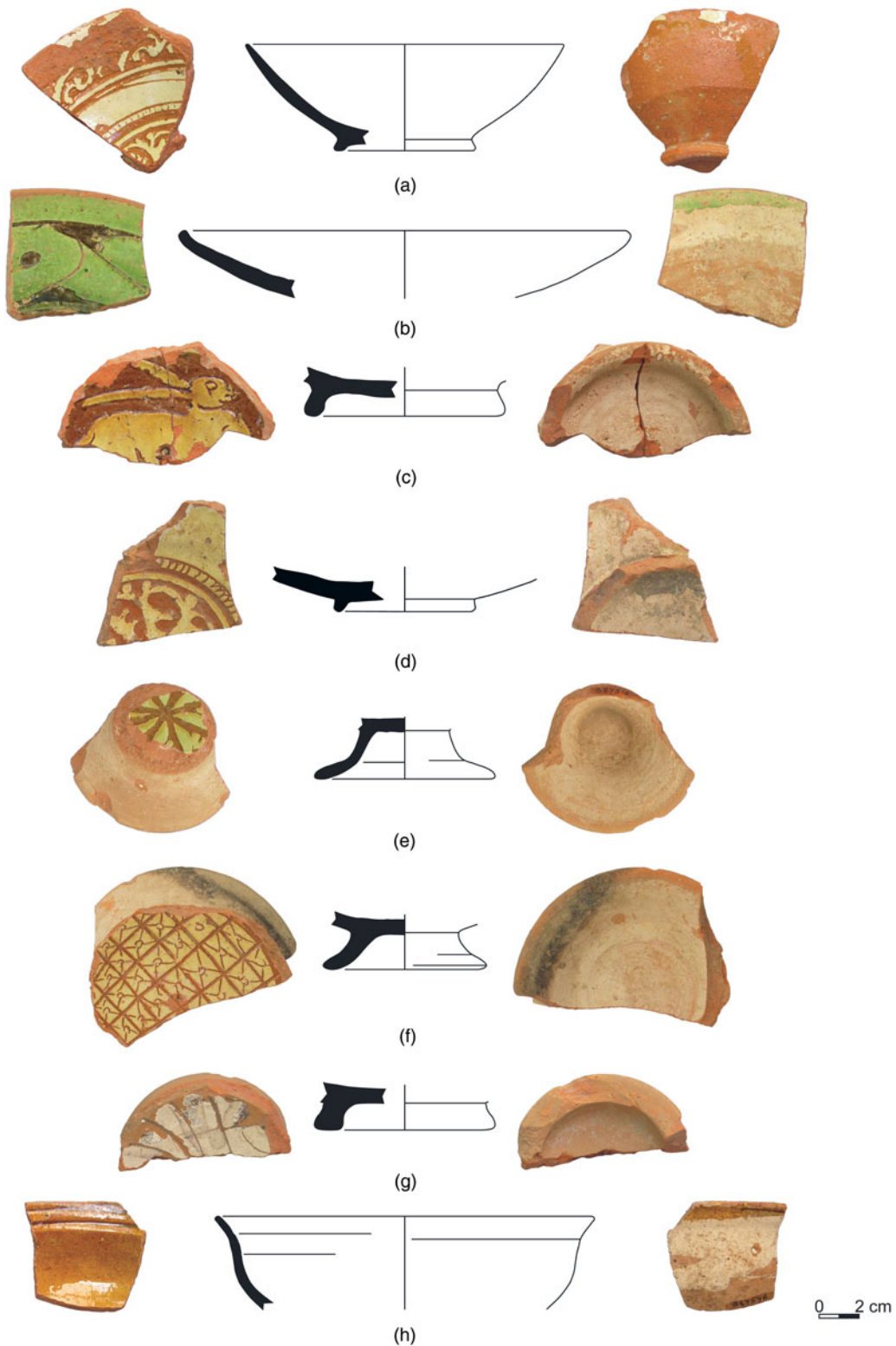


Fig. 12. Ceramics belonging to chemical group 'Chalcis production': MBP: Champlévé, and various other Wares. (a) Cat. no. **49** (BZY540); (b) Cat. no. **41** (BZY526); (c) Cat. no. **66** (BZY562); (d) Cat. no. **50** (BZY545); (e) Cat. no. **40** (BZY518); (f) Cat. no. **43** (BZY535); (g) Cat. no. **70** (BZY558); (h) Cat. no. **51** (BZY546).

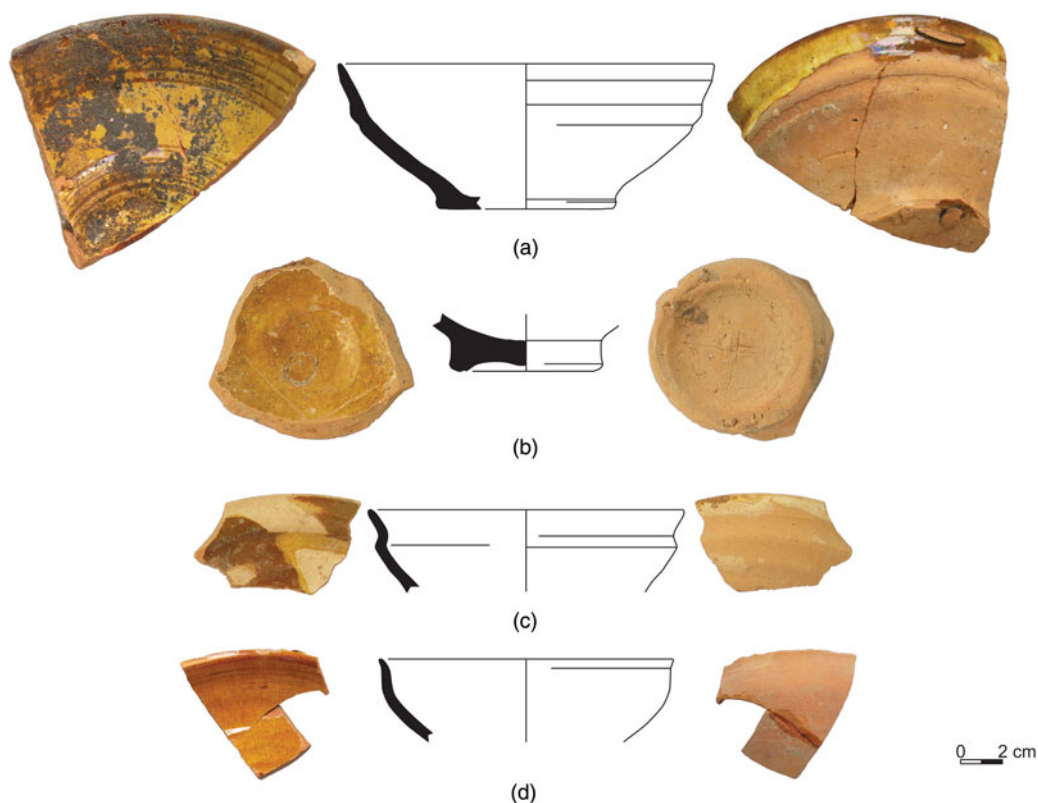


Fig. 13. Chemical outliers, not included in previously defined chemical groups, except for BZY549 which is part of the 'Novy Svet Ware'. (a) Cat. no. **69** (BZY559); (b) Cat. no. **42** (BZY500); (c) Cat. no. **45** (BZY527); (d) Cat. no. **52** (BZY549).

### SAMPLES CATALOGUE

The catalogue presents all ceramics included in the sampling. It is organised by excavation site, chronology and type, but with the local reference material (tripod stilts, unfinished vessels) and similar finished examples presented first under each excavation site. Ceramics coming from the *intra muros* area of Chalcis, because of their small number, were catalogued as a whole according to their type, regardless of their find spot. The ceramics are numbered consecutively, while their number in the laboratory in Lyon is given in square brackets. The description of each ceramic is followed by a reference to its find-group in the excavation, and the dating of the find-group. The chronology given next to the heading of each type has been based on the excavation context (find-group), taking into account the chronology of Corinth (Sanders 1995; 1999; 2000; 2003).

Fabric colour is described according to the *Munsell Soil Color Charts* (1998 edition), used in natural light. The quantity and size of inclusions and voids (pores) is described as follows: occasional to rare = 1% or less, few to some = 2–5%, many = 5–10%; small = less than 1 mm, medium = 1–2 mm, large = 2–5 mm.

#### A. Thebes – *extra muros*, 3 Pouliopoulou Street

The samples taken from this excavation come from various find-groups, which contained: (a) pottery dating from the mid-twelfth to the mid-thirteenth century (coming from lower layers in trenches 1 and 2, find-groups 10–15), (b) mainly pottery dating from around the mid-thirteenth to the early fourteenth century – characterised by the significant presence of unfinished and finished Sgraffito with Concentric Circles – and occasional earlier pieces (coming from upper

layers in trenches 1 and 2, find-groups 5–9), and (c) pottery dating from around the mid-twelfth to the early fourteenth century (from trial trenches, find-groups 2, 3, 4 and 27).

*Tripod stilts (thirteenth – early fourteenth century)*<sup>10</sup>

1. [BZY536] Tripod stilt. Length: 0.06 m. Width: 0.019 m. Small part missing. Fabric: fine, clean, 5YR 7/4 to 7/6 (pink to reddish yellow). Traces of glaze.  
Found in: area to the north-east of trench 1, find-group 27.
2. [BZY537] Tripod stilt. Length: 0.058 m. Width: 0.018 m. About half preserved. Fabric: fine, clean, 5YR 7/6 (reddish yellow). Traces of glaze.  
Found in: area to the north-east of trench 1, find-group 27.

*Sgraffito with Concentric Circles (second half of thirteenth century – early fourteenth century), including unfinished wares*

3. [BZY493] Bowl, rim fragment. Estimated rim diameter: 0.20 m. Preserved height: 0.03 m. Small part of vertical rim with rounded lip preserved. Fabric: 5YR 7/4 (pink), with rare small white inclusions and rare small voids. White slip inside and around rim outside. Inside, two groups of incised horizontal lines on rim and on lip. No glaze (unfinished). Exterior bare.  
Found in: trench 2, find-group 8.  
[Fig. 3e](#)
4. [BZY494] Bowl, rim fragment. Estimated rim diameter: 0.20 m. Preserved height: 0.027 m. Small part of out-turned rim with rounded lip and very small part of upper body. Fabric: 5YR 7/4 (pink), with few small white inclusions and some small-to-medium voids. Whitish slip inside and around rim outside. Inside, a horizontal and a wavy line on rim. No glaze (unfinished). Exterior bare. Found in: trench 2, find-group 8.  
[Fig. 3h](#)
5. [BZY495] Bowl, rim and body fragment. Estimated rim diameter: 0.19 m. Preserved height: 0.033 m. Small part of rounded upper body and upturned rim with rounded lip. Fabric: 5YR 7/4 (pink), with rare small white inclusions and rare small-to-medium voids. White slip inside and around rim outside. Inside a horizontal and a wavy line on rim. No glaze (unfinished). Exterior bare.  
Found in: trench 2, find-group 8.  
[Figs. 5k, 3d](#)
6. [BZY496] Bowl, rim and body fragment. Estimated rim diameter: 0.20 m. Preserved height: 0.04 m. Small part of flaring upper body and vertical rim with rounded lip. Fabric: 5YR 7/4 (pink), with rare small white inclusions and few small-to-medium voids. Inside, whitish slip. Two groups of horizontal lines on rim, a wavy line on upper body. No glaze (unfinished). Exterior bare.  
Found in: trench 2, find-group 8.  
[Fig. 3f](#)
7. [BZY497] Bowl, rim and body fragment. Estimated rim diameter: 0.22 m. Preserved height: 0.035 m. Part of hemispherical upper body and out-turned rim with slightly pointed lip. Fabric: 2.5YR 7/6 (light red), with rare small white inclusions and few small-to-large voids. Inside, traces of white slip and glaze. Two pairs of horizontal and a wavy line on rim, a pair of horizontal lines on upper body. Exterior bare.  
Found in: trench 2, find-group 8.  
[Fig. 3i](#)
8. [BZY498] Bowl, base and body fragment. Estimated base diameter: 0.07 m. Preserved height: 0.045 m. Two joining fragments preserve about half of ring-base and part of hemispherical body. Fabric: 5YR 6/6 (reddish yellow), with rare small white and brown inclusions and some small-to-medium voids. Inside, white slip and yellow glaze. Two groups of concentric circles on body. Wash outside.  
Found in: trench 2, find-group 8.  
[Fig. 4d](#)
9. [BZY504] Bowl. Estimated rim diameter: 0.12 m. Estimated base diameter: 0.051 m. Preserved height: 0.064 m. Two mended pieces and four non-joining fragments preserve entire low ring-foot and large part of hemispherical body ending in slightly pointed lip (complete profile). Fabric: 2.5YR 6/4 (light reddish brown), with few small white inclusions and rare small voids. White slip and yellow glaze inside and around rim outside, dripping downwards. Inside, three groups of incised concentric circles on body and rim. Exterior bare.

<sup>10</sup> Some of the tripod stilts and unfinished wares found in this excavation are illustrated in Koilakou 2001–4, fig. 13.

Found in: trench 2, find-group 8.

Fig. 4f

10. [BZY506] Bowl, rim and body fragment. Estimated rim diameter: 0.18 m. Preserved height: 0.065 m. Three mended pieces preserve part of flaring upper body and vertical inwardly thickened rim. Fabric: 7.5YR 7/4 (pink), with few small white inclusions and few small voids. Thin whitish slip inside and around rim outside. Inside, a wavy and three double incised horizontal circles on rim and body. No glaze (unfinished). Exterior bare. Found in: trench 2, find-group 8.

Fig. 3g

11. [BZY507] Bowl, base and body fragment. Estimated base diameter: 0.07 m. Preserved height: 0.038 m. Two mended pieces preserve part of high ring-foot and rounded lower body. Fabric: 7.5YR 7/4 (pink), with rare small white and brown inclusions, rare small voids. Inside, white slip. A group of incised concentric circles on lower body. No glaze (unfinished). Exterior bare.

Found in: trench 2, find-group 8.

Fig. 4b

12. [BZY508] Bowl, base and body fragment. Estimated base diameter: 0.076 m. Preserved height: 0.064 m. Two mended pieces preserve large part of high ring-foot and hemispherical body. Fabric: 7.5YR 7/6 (reddish yellow), with rare small white inclusions and rare medium-to-large voids. Inside, white slip (partly peeled). A group of incised concentric circles on lower body. No glaze (unfinished). Exterior bare.

Found in: trench 2, find-group 8.

Fig. 4e

13. [BZY509] Bowl, base and body fragment. Estimated base diameter: 0.08 m. Preserved height: 0.046 m. Two joining fragments preserve part of low ring-foot and part of hemispherical body. Fabric: 10YR 7/3 (very pale brown), with few small-to-medium white and brown inclusions and few small-to-medium voids. Inside, white slip. A group of incised concentric circles on lower body. No glaze (unfinished). Exterior bare.

Found in: cleaning of wall 3, find-group 3.

Fig. 4a

14. [BZY510] Bowl, base and body fragment. Estimated base diameter: 0.06 m. Preserved height: 0.024 m. Two joining fragments preserve part of low ring-foot and very small part of lower body. Fabric: 7.5YR 7/4 (pink), with rare small white inclusions and some small voids. Inside, white slip. A group of incised concentric circles on lower body surrounded by a series of little spiral motifs. No glaze (unfinished). Exterior bare.

Found in: cleaning of wall 3, find-group 3.

Fig. 4c

*Unfinished wares with impressed decoration (second half of thirteenth – early fourteenth century)*

15. [BZY492] Bowl, rim and body fragment. Estimated rim diameter: 0.18 m. Preserved height: 0.05 m. Part of rounded upper body and vertical rim with 'notches', ending in rounded lip. Fabric: 7.5YR 7/4 (pink), with rare small white inclusions and some small-to-medium voids. Pinkish slip inside and around rim outside. Inside, incised horizontal lines on upper body and rim, a wavy line on rim. No glaze (unfinished). Exterior bare. Found in: trench 2, find-group 8.

Fig. 3c

16. [BZY499] Open form, rim and body fragment. Estimated rim diameter: 0.20 m. Preserved height: 0.055 m. Part of rounded upper body and vertical rim with flat lip. Fabric: 2.5YR 6/6 (light red), with few small white inclusions and some small-to-medium voids. Yellow slip inside and around rim outside. Traces of green paint. No glaze (unfinished). Exterior bare.

Found in: trench 2, find-group 8.

Fig. 3a

17. [BZY505] Bowl, rim and body fragment. Estimated rim diameter: 0.18 m. Preserved height: 0.056 m. Four mended pieces preserve part of rounded body and upturned rim with rounded lip. 'Notches' at junction of rim with body outside. Fabric: 7.5YR 7/4 (pink), with rare small white inclusions and few small voids. Pale-pink slip inside and around rim outside. No glaze (unfinished). Exterior bare.

Found in: trench 2, find-group 8.

Fig. 3b

*Slip-Painted Ware (second half of twelfth – early thirteenth century)*

18. [BZY515] Bowl, rim and body fragment. Estimated rim diameter: 0.19 m. Preserved height: 0.062 m. Part of flaring upper body and vertical rim with rounded lip. Fabric: 5YR 6/6 (reddish yellow), with few small white inclusions and some small-to-medium voids. Inside, colourless glaze. Slip-painted decoration with geometric curvilinear designs on body, a horizontal and a wavy line on rim. Slip-painted dots on lip. White wash outside. (Light on Dark Slip-Painted II.)

Found in: trench 1, find-group 14.

[Fig. 9a](#)

19. [BZY520] Bowl, base and body fragment. Estimated base diameter: 0.12 m. Preserved height: 0.035 m. About half of ring-base and very small part of rounded lower body preserved. Fabric: 5YR 6/6 (reddish yellow), with few small-to-medium white inclusions and few small-to-medium voids. Inside, colourless glaze and slip-painted decoration with spirals within triangles. Wash outside. (Light on Dark Slip-Painted II.)

Found in: trench 1, find-group 12.

[Figs. 5h, 9c](#)

20. [BZY532] Bowl, rim and body fragment. Estimated rim diameter: 0.24 m. Preserved height: 0.075 m. Part of flaring upper body and vertical rim with rounded lip. Fabric: c.2.5YR 6/4 (light reddish brown), with few small-to-medium white inclusions and few small voids. Pale-yellowish glaze inside and around rim outside dripping downwards. Inside, slip-painted decoration with geometric and curvilinear motifs on body, a horizontal line on rim and a series of dots on lip. White wash outside. (Light on Dark Slip-Painted II.)

Found in: trial trench east of wall 1, find-group 4.

[Fig. 9b](#)

### *Green and Brown Painted Ware (c. mid-twelfth – mid-thirteenth century)*

21. [BZY511] Open form, rim and body fragment. Preserved dimensions: 0.057 × 0.031 m. Small part of vertical rim ending in outwardly thickened lip and very small part of upper body preserved. Fabric: 2.5YR 6/6 (light red), with rare small white inclusions and rare small voids. Inside, white slip and colourless glaze. Painted decoration with brown outlines and green colour, two brown concentric circles below rim. White wash outside. (Green and Brown Painted Ware III.)

Found in: cleaning of wall 3, find-group 3.

[Figs. 5i, 8d](#)

22. [BZY514] Part of a bowl. Estimated rim diameter: 0.20 m. Estimated base diameter: 0.07 m. Height: 0.075 m. Four mended pieces preserve about half of ring-base and part of hemispherical body ending in slightly pointed lip (complete profile). Fabric: 2.5YR 6/6 (light red), with few small white and rare small brown inclusions, some small voids. White slip and colourless glaze inside and around rim outside. Inside, painted decoration with spirals and other circular motifs outlined in brown and filled in with green paint. White wash outside. (Green and Brown Painted Ware III: similar to Sanders 1999, fig. 8; the same in Sanders 2003, fig. 23.2 no. 14.)

Found in: trench 1, find-group 13.

[Fig. 8f](#)

23. [BZY528] Bowl, rim and body fragment. Estimated rim diameter: 0.26 m. Preserved height: 0.026 m. Small part of flaring upper body with vertical rim ending in slightly pointed lip. Fabric: 2.5YR 6/6 (light red), with few small-to-medium white inclusions and few small-to-medium voids. White slip and thin colourless glaze inside and around rim outside. Inside, geometric decoration in alternating green and dark-brown paint. Wash outside. (Green and Brown Painted Ware II.)

Found in: trench 2, find-group 9.

[Fig. 8g](#)

### *Fine Sgraffito Ware (c. mid-twelfth – early thirteenth century)*

24. [BZY502] Open form, base and body fragment. Estimated base diameter: 0.09 m. Preserved height: 0.022 m. Small part of ring-base and flaring lower body preserved. Fabric: 2.5YR 7/4 (light reddish brown), with few small white inclusions and rare small-to-medium voids. Inside, white slip and pale-yellowish glaze. Part of incised decoration with curvilinear motifs (and a bird?). Exterior bare. (Developed style? see Sanders 2003, fig. 23.3 no. 16.)

Found in: trench 2, find-group: 8.

[Fig. 10a](#)

25. [BZY517] Bowl, base and body fragment. Estimated base diameter: 0.09 m. Preserved height: 0.04 m. Small part of ring-base and rounded lower body preserved. Fabric: 5YR 6/6 (reddish yellow), with rare small white inclusions and rare small voids. Inside, white slip and pale-yellow glaze. Incised concentric circles enclosing curvilinear designs. Exterior bare.

Found in: trench 1, find-group 14.

[Fig. 10d](#)

26. [BZY524] Bowl, base and body fragment. Estimated base diameter: 0.07 m. Preserved height: 0.021 m. About half of ring-base and small part of rounded lower body preserved. Fabric: 2.5YR 6/6 (light red), with rare small white inclusions and some small-to-large voids. Inside, white slip and pale-yellow glaze. Incised medallion defined by two concentric circles and enclosing linked spirals. Compass mark. Exterior bare.

Found in: trench 1, find-group 5.

[Fig. 10b](#)

27. [BZY531] Bowl, base and body fragment. Estimated base diameter: 0.08 m. Preserved height: 0.043 m. Small part of ring-base and hemispherical body preserved. Fabric: 2.5YR 6/6 (light red), with rare small white inclusions and some small-to-large voids. Inside, white slip and pale-yellow glaze. Incised medallion defined by two concentric circles and enclosing interlace design and scale pattern. Traces of yellow glaze on upper body outside. (Similar to: Hayes 1992, 139, pl. 10d, from a closed deposit of the second half of the twelfth century.)

Found in: trial trench, find-group 2.

Fig. 10c

*Painted Sgraffito (c. mid-twelfth to end of twelfth century)*

28. [BZY503] Open form, base fragment. Estimated base diameter: 0.11 m. Preserved height: 0.016 m. Part of ring-base preserved. Fabric: 2.5YR 6/6 (light red), with rare small white inclusions and rare small voids. Inside, white slip and pale-yellowish glaze. Part of incised central medallion containing curvilinear motifs and surrounded by a series of small brown painted *S* motifs. White wash outside.

Found in: trench 2, find-group 8.

Fig. 9e

29. [BZY513] Open form, base and body fragment. Estimated base diameter: 0.14 m. Preserved height: 0.02 m. Small part of ring-base and rounded lower body preserved. Fabric: 2.5YR 6/8 (light red), with rare small white inclusions and few small voids. Inside, white slip and colourless glaze. Uncertain central motif painted in green and dark brown, surrounded by a band defined by two incised concentric circles and enclosing a series of a repeating kufic motif. Exterior bare.

Found in: trench 1, find-group 13.

Fig. 9f

30. [BZY533] Bowl, rim and body fragment. Estimated rim diameter: 0.26 m. Preserved height: 0.038 m. Small part of rounded upper body and horizontal rim with rounded lip. Fabric: 2.5YR 6/6 (light red), with rare small-to-medium white inclusions and rare small voids. White slip and colourless glaze inside and around rim outside. Inside, a group of two incised concentric circles on upper body surrounding curvilinear motifs. A series of brown painted vertical stripes on and below rim. Thin white slip outside (decoration similar to Morgan 1942, pl. XLVIIh).

Found in: trial trench east of wall 1, find-group 4.

Figs. 5j, 9d

*Incised Sgraffito (c. second half of twelfth – mid-thirteenth century)*

31. [BZY512] Bowl, rim and body fragment. Estimated rim diameter: 0.16 m. Preserved height: 0.038 m. Very small part of flaring upper body ending in slightly pointed lip. Fabric: 5YR 5/6 (yellowish red), with few small-to-medium white inclusions and few small voids. White slip inside and around rim outside. Colourless glaze on both sides. Inside, incised band around rim defined by double concentric circles and containing repeating linear motif. Traces of another band of vertical slashes on wall ('Medallion' Style).

Found in: trench 1, find-group 13.

Figs. 5l, 10g

32. [BZY516] Bowl, rim and body fragment. Estimated rim diameter: 0.19 m. Preserved height: 0.046 m. Small part of flaring upper body ending in rounded lip. Fabric: 5YR 6/4 to 6/6 (light reddish brown to reddish yellow), with few small white inclusions and rare small voids. White slip on both sides. Pale-yellow glaze inside and around rim outside. Inside, small circle enclosing an 'X'.

Found in: trench 1, find-group 14.

Fig. 11c

33. [BZY521] Bowl, rim and body fragment. Estimated rim diameter: 0.24 m. Preserved height: 0.03 m. Small part of hemispherical body ending in rounded lip. Fabric: 2.5YR 6/8 to 7/8 (light red), with rare small-to-medium white and rare brown inclusions, rare small voids. White slip and pale yellow-green glaze inside and around rim outside. Inside, traces of incised curvilinear designs. White wash outside.

Found in: trench 1, find-group 12.

Fig. 11d

34. [BZY522] Open form, base and body fragment. Estimated base diameter: 0.08 m. Preserved height: 0.037 m. Small part of ring-base and flaring lower body. Fabric: 2.5YR 6/6 (light red), with few small white inclusions and some small-to-medium voids. White slip on both sides. Inside, green glaze and part of undiagnostic incised decoration freely applied on the field (Free Style).

Found in: trench 2, find-group 7.

Fig. 11f

35. [BZY523] Bowl, base and body fragment. Estimated base diameter: 0.09 m. Preserved height: 0.025 m. Small part of ring-base and very small part of rounded lower body preserved. Fabric: 5YR 7/6 (reddish yellow), with

few small white inclusions and few small-to-medium voids. Inside, white slip and green glaze. A band of small vertical incised lines enclosing a bird and V-shaped motifs. White wash outside. (Intermediate Style: *e.g.* Sanders 1999, 162, 175 no. 202)

Found in: trench 2, find-group 11.

Fig. 9g

36. [BZY525] Bowl, base and body fragment. Estimated base diameter: 0.11 m. Preserved height: 0.032 m. Small part of ring-base and wide flaring lower body. Fabric: 5YR 6/6 to 6/8 (reddish yellow), with rare small white inclusions and rare small voids. Inside, white slip and shiny yellow glaze. Parts of undiagnostic incised curvilinear designs. Whitish slip outside, including the underside of base (Free Style).

Found in: trench 2, find-group 10.

Fig. 11e

37. [BZY529] Bowl, rim and body fragment. Estimated rim diameter: 0.21 m. Preserved height: 0.04 m. Two mended pieces preserve part of flaring body ending in rounded lip. Fabric: 2.5YR 7/6 (light red), with rare small white inclusions and few small-to-medium voids. Inside, white slip and yellowish glaze. Repeating small incised circular motif filled in with little horizontal and a vertical line. White wash outside.

Found in: trench 1, find-group 12.

Fig. 11b

38. [BZY530] Bowl, rim and body fragment. Estimated rim diameter: 0.24 m. Preserved height: 0.065 m. Two mended pieces preserve part of hemispherical body ending in rounded lip. Fabric: 5YR 7/6 (reddish yellow), with few small white inclusions and some small voids. White slip and pale-yellowish glaze inside and around rim outside. On upper wall inside, incised band defined by two concentric circles and enclosing a group of horizontal lines cut by small vertical lines. Wash outside.

Found in: trench 2, find-group 2.

Figs. 5e, 11a

39. [BZY534] Bowl, rim and body fragment. Estimated rim diameter: 0.34 m. Preserved height: 0.046 m. Part of flaring upper body and vertical rim with slightly pointed lip. Fabric: 2.5YR 6/4 (light reddish brown), with some small white inclusions and rare small voids. White slip inside and around rim outside dripping downwards. Pale-green glaze on both sides. Inside, incised band on upper body defined by two horizontal lines and containing a series of a repeating linear motif. Part of a circular motif with vertical and horizontal lines on lower body ('Medallion' Style).

Found in: trench east of wall 1, find-group 4.

Figs. 5f, 10f

#### *Champlevé Ware (c. late twelfth – early thirteenth century)*

40. [BZY518] Bowl, base fragment. Estimated base diameter: 0.09 m. Preserved height: 0.033 m. Large part of high foot preserved. Fabric: 5YR 6/6 (reddish yellow), with rare small-to-medium white inclusions and rare small voids. Inside, white slip and light-green glaze. Part of vegetal(?) champlevé decoration preserved. White wash outside, including the underside of base (similar to Morgan 1942, pl. LIIIo).

Found in: trench 1, find-group 14.

Fig. 12e

41. [BZY526] Bowl, rim and body fragment. Estimated rim diameter: 0.20 m. Preserved height: 0.038 m. Small part of flaring upper body ending in inturned rim with rounded lip. Fabric: 5YR 6/6 (reddish yellow), with rare small white inclusions and rare small voids. White slip and green glaze inside and around rim outside. Part of undiagnostic champlevé decoration inside. Exterior bare.

Found in: trench 2, find-group 10.

Figs. 5g, 12b

#### *Monochrome Sgraffito Ware (second half of thirteenth – early fourteenth century)*

42. [BZY500] Bowl, base fragment. Estimated base diameter: 0.075 m. Preserved height: 0.024 m. Part of low ring-base and very small part of lower body. Fabric: 5YR 7/4 (pink), with few small-to-medium white inclusions and few small-to-medium voids. Inside, white slip and yellowish-brown glaze. Careless incised sgraffito at the centre. Exterior bare. (Similarities in shape and decoration to Sanders 1987, 163–6: 'Late Sgraffito Ware'; Gregory 1993, 284–8, pls. 1–2: 'Local Ware A', dated to the second half of the thirteenth and into the fourteenth century; Vroom 2003, fig. 6.26 w17.5: 'Monochrome Sgraffito Ware from Corinth?')

Found in: trench 2, find-group 8.

Fig. 13b

43. [BZY535] Bowl, base fragment. Estimated base diameter: 0.12 m. Preserved height: 0.027 m. Part of low ring-foot and very small part of lower body. Fabric: 2.5YR 6/6 (light red), with few small-to-medium white inclusions and few small-to-medium voids. Whitish slip on both sides including the underside of base. Inside yellow glaze. Part of central medallion with grid pattern, bearing an 'X' motif in each square. Compass point.

Found in: trial trench east of wall I, find-group 4.

[Fig. 12f](#)

*Plain Glazed and Partially Glazed Wares (thirteenth – early fourteenth century)*

44. [BZY501] Bowl, rim and body fragment. Estimated rim diameter: 0.145 m. Preserved height: 0.04 m. Small part of flaring upper body and vertical rim with rounded lip. Fabric: 2.5YR 6/8 (light red), with few small white inclusions and few small voids. White slip and pale-greenish glaze inside and around rim outside, dripping downwards. Exterior bare.

Found in: trench 2, find-group 8.

[Fig. 6f](#)

45. [BZY527] Bowl, rim and body fragment. Estimated rim diameter: 0.14 m. Preserved height: 0.037 m. Small part of flaring upper body and out-turned rim with rounded lip. Fabric: 5YR 7/4 (pink), with rare small-to-medium white inclusions and rare small voids. Whitish slip inside and around rim outside, partially covered by yellow and brown glaze inside. Exterior bare.

Found in: trench I, find-group 15.

[Fig. 13c](#)

## B. Chalcis – *extra muros*

### B.1. 9 Mitropoleos Street

Except for the two tripod stilts, which come from the upper layers of rubbish pit 2 (BZY550: find-group 26, fourteenth–fifteenth century) and the upper layers of the excavation (BZY551: trench  $\Gamma$ , find-group 11: thirteenth–fourteenth century), all samples were taken from pit 6, which represents a homogeneous thirteenth century context, based on numismatic evidence.<sup>11</sup>

*Tripod stilts (thirteenth–fifteenth centuries)*

46. [BZY550] Tripod stilt. Preserved dimensions: 0.052 × 0.04 m. Width: 0.015 m. Small part from the centre preserved. Fabric: 5YR 5/3 to 5/4 (reddish brown), with few small white inclusions and some small voids. Traces of glaze.

Found in: pit 2, find-group 26.

47. [BZY551] Tripod stilt. Length: 0.08 m. Width: 0.03 m. Small part missing. Fabric: 2.5YR 6/4 to 7/4 (light reddish brown), with rare small white inclusions and many small-to-large voids. Traces of glaze.

Found in: trench  $\Gamma$ , find-group 11.

*Green and Brown Painted Ware (early thirteenth century)*

48. [BZY544] Bowl, rim fragment. Preserved dimensions: 0.066 × 0.056 m. Small part of vertical rim and very small part of upper body preserved. Fabric: 2.5YR 6/6 (light red), with few small white inclusions and some small voids. White slip and colourless glaze inside and around rim outside. Inside, a band defined by pairs of brown lines and containing a series of vertical brown curved lines filled in with green stripes. Traces of green paint on upper wall. Brown dots on lip. (Green and Brown Painted Ware III.)

Found in: pit 6.

[Fig. 8b](#)

*Champlevé Ware (early thirteenth century)*

49. [BZY540] Bowl. Estimated rim diameter: 0.14 m. Estimated base diameter: 0.08 m. Height: 0.055 m. Small part of ring-base and flaring body ending in slightly pointed lip (complete profile). Fabric: 2.5YR 5/6 (red), with some small-to-medium white inclusions and rare small voids. White slip inside. Colourless glaze on both sides. Inside, medallion at the centre and a band on rim both containing champlevé vegetal motifs (partly peeled).

Found in: pit 6.

[Fig. 12a](#)

50. [BZY545] Open form, base and body fragment. Estimated base diameter: c.0.07 m. Preserved height: 0.03 m. Part of ring-base and small part of flaring lower body preserved. Fabric: 2.5YR 7/4 to 6/4 (light reddish brown), with some small white inclusions and few small-to-large voids. White slip on both sides. Inside, colourless glaze. A medallion at the centre containing champlevé vegetal(?) motifs.

<sup>11</sup> The coins found in this excavation have been studied and will be published by Julian Baker.



Found in: pit 6.

Fig. 12d

*Sgraffito with Concentric Circles (second half of thirteenth century)*

51. [BZY546] Bowl, rim and body fragment. Estimated rim diameter: 0.22 m. Preserved height: 0.04 m. Small part of rounded upper body and out-turned rim with rounded lip. Fabric: 2.5YR 6/6 (light red), with rare small-to-medium white inclusions and rare small voids. White slip and shiny yellow-brown glaze inside and around rim outside. Two incised concentric circles on rim inside.

Found in: pit 6.

Fig. 12h

52. [BZY549] Bowl, rim and body fragment. Estimated rim diameter: 0.13 m. Preserved height: c.0.06 m. Two mended pieces preserve part of hemispherical upper body and vertical rim with slightly pointed lip. Fabric: 5YR 6/6 (reddish yellow), with rare small white inclusions and rare small voids. Inside, white slip and shiny brown glaze. Exterior bare.

Found in: pit 6.

Fig. 13d

*Plain Glazed and Painted Wares, including Partially Glazed Wares (thirteenth century)<sup>12</sup>*

53. [BZY538] Bowl. Estimated rim diameter: 0.19 m. Base diameter: c.0.08 m. Height: 0.078 m. Entire ring-base, large part of hemispherical body and slightly out-turned rim ending in rounded lip (complete profile). Fabric: 5YR 6/6 to 2.5YR 6/6 (reddish yellow to light red), with many small-to-large white inclusions and many small-to-large voids. Pinkish slip on parts of the interior and on lip, dripping downwards outside. Pale-green glaze inside and on lip.

Found in: pit 6.

Fig. 7b

54. [BZY539] Part of a bowl. Entire ring-base and large part of flaring body ending in squared lip (complete profile). Estimated rim diameter: 0.195 m. Base diameter: 0.07 m. Height: 0.058 m. Fabric: 2.5YR 6/4 (light reddish brown), with many small-to-large white inclusions and many small-to-medium voids. White slip inside and around rim outside. Interior covered by thin colourless glaze and 'decorated' with green glazed splashes at the centre and on body. (Similar to catalogue nos. 56–8 [BZY543, 547, 548] but fully glazed inside.)

Found in: pit 6.

Fig. 6e

55. [BZY541] Part of a bowl. Estimated rim diameter: c.0.11 m. Base diameter: c.0.048 m. Height: 0.056 m. Entire ring-base, large part of hemispherical body and small part of slightly out-turned rim ending in slightly pointed rim (complete profile). Fabric: 5YR 6/6 to 2.5YR 6/6 (reddish yellow to light red), with rare small-to-medium white inclusions and some small-to-large voids. Thin white slip inside and around rim outside dripping downwards. Pale-green glaze inside and around rim outside.

Found in: pit 6.

Fig. 7a

56. [BZY543] Part of a bowl. Three mended pieces preserve part of ring-base and large part of hemispherical body ending in rounded lip (complete profile). Estimated rim diameter: 0.19 m. Estimated base diameter: 0.09 m. Height: 0.078 m. Fabric: 2.5YR 6/6 (light red), with many small white and rare brown inclusions, many small-to-large voids. Pinkish slip inside and around rim outside dripping downwards. Inside, green glazed splashes on body and rim.

Found in: pit 6.

Fig. 7c

57. [BZY547] Bowl, base and body fragment. Base diameter: 0.067 m. Preserved height: 0.04 m. Two mended pieces preserve entire ring-base and small part of flaring body (profile from base to below rim). Fabric: 2.5YR 6/8 to 7/8 (light red), with few small-to-medium white inclusions and many small-to-medium voids. Pale-yellowish slip inside and around rim outside. Green glazed splashes inside.

Found in: pit 6.

Fig. 6a

58. [BZY548] Bowl, rim and body fragment. Estimated rim diameter: 0.24 m. Preserved height: 0.037 m. Two mended pieces preserve part of flaring upper body ending in thickened squared rim. Fabric: 2.5YR 5/8 (red), with rare small white inclusions and rare small voids. Thin pinkish slip inside and on lip. Careless green glazed stripe on rim inside.

Found in: pit 6.

Fig. 6c

<sup>12</sup> The ware named here 'Partially Glazed Ware' is distinctive for its abundance in Chalcis. It bears similarities to some wares of the mid-13th – early 14th century from Corinth (see Stillwell-MacKay 2003, 412–13, fig. 24:7).

### B.2. 33 Balaleon Street

The samples taken from this excavation come from various find-groups, which contained: (a) pottery dating from the mid-twelfth to around the mid-thirteenth century (find-groups 18, 29, 30), (b) pottery dating from around the mid-thirteenth to the fifteenth/sixteenth century (find-groups 13, 19, 21, 22, 32, 33).

#### *Tripod stilts (mid-thirteenth to fifteenth century)*

59. [BZY552] Tripod stilt. Length: 0.115 m. Width: 0.025 m. Small part missing. Fabric: fine, clean, 2.5YR 6/4 to 6/6 (light reddish brown to light red). Traces of dark-brown glaze.  
Found in: trench A, find-group 21  
[Fig. 5a](#)
60. [BZY553] Tripod stilt. Preserved dimensions: 0.06 × 0.054 m. Width: 0.022 m. Large part missing. Fabric: fine, clean, 5YR 6/4 to 2.5 YR 6/4 (light reddish brown).  
Found in: trench A, find-group 22.  
[Fig. 5b](#)
61. [BZY554] Tripod stilt. Preserved length: 0.049 m. Width: 0.025 m. Large part missing. Fabric: fine, 5YR 5/4 to 6/6 (reddish brown), with few small white inclusions and rare small voids. Traces of dark-brown glaze.  
Found in: trench A, find-group 19.  
[Fig. 5c](#)
62. [BZY563] Tripod stilt. Length: 0.07 m. Width: 0.025 m. Large part missing. Fabric: fine, c.2.5YR 5/4 (reddish brown), with few small white inclusions and rare small voids. Traces of dark-brown glaze.  
Found in: trench A, find-group 19.

#### *Over-fired Unglazed Ware (mid-twelfth to around the mid-thirteenth century)*

63. [BZY555] Closed form, rim fragment. Preserved dimensions: 0.09 × 0.06 m. Part of trefoil mouth. Over-fired, waster?  
Found in: trench A, find-group 30.  
[Fig. 5d](#)

#### *Green and Brown Painted Ware (c.late twelfth – mid-thirteenth century)*

64. [BZY560] Bowl, rim and body fragment. Estimated rim diameter: 0.21 m. Preserved height: 0.04 m. Part of flaring upper body and vertical rim with slightly pointed lip. Fabric: 2.5YR 6/4 (light reddish brown), with few small-to-medium white inclusions and few small voids. White slip inside and over rim outside, dripping downwards. Colourless glaze inside. Vegetal decoration outlined in dark brown and filled in with green paint. Horizontal green stripe on rim. Exterior bare. (Green and Brown Painted Ware, group III.)  
Found in: trench A, find-group 30.  
[Fig. 8a](#)
65. [BZY561] Part of bowl. Estimated base diameter: 0.093 m. Preserved height: 0.08 m. Six mended pieces preserve large part of ring-base, and small part of flaring body with nearly vertical rim. Fabric: 2.5YR 6/6 (light red), with few small-to-medium white inclusions and few small voids. White slip and colourless glaze inside. Vegetal and geometrical decoration on body outlined in dark green and filled in with green paint, green spirals on rim. Wash outside. (Green and Brown Painted Ware, group III.)  
Found in: trench A, find-group 29.  
[Fig. 8c](#)

#### *Champlevé Ware (late twelfth – early thirteenth century)*

66. [BZY562] Bowl, base and fragment. Estimated base diameter: 0.115 m. Preserved height: 0.025 m. Almost half ring-base preserved. Fabric: 5YR 5/6 to 6/6 (reddish yellow to yellowish red), with few small white inclusions and some small voids. Pale-yellowish slip on both sides. Inside, yellow glaze and part of champlevé rabbit.  
Found in: trench A, find-group 18.  
[Fig. 12c](#)

#### *Partially Glazed Ware (thirteenth century)<sup>13</sup>*

67. [BZY556] Bowl, base fragment. Base diameter: 0.08 m. Preserved height: 0.025 m. Part of ring-base and small part of rounded lower body preserved. Fabric: 2.5YR 5/6 to 6/8 (light red to red), with some small-to-medium white inclusions and some small-to-medium voids. Inside, pinkish slip and green glazed blob. Wash outside.

<sup>13</sup> Same as the Partially Glazed Ware from 9 Mitropoleos Street.

Found in: trench A, find-group 22.

[Fig. 6b](#)

68. [BZY557] Bowl, rim and body fragment. Estimated rim diameter: 0.12 m. Preserved height: c.0.04 m. Small fragment of slightly flaring upper body with grooved rim ending in slightly pointed lip. Fabric: 2.5YR 5/6 to 6/6 (light red to red), with few small white inclusions and few small voids. Inside, pale-yellowish slip and trace of green glazed decoration. Mark of tripod stilt. Slip dripping down outside.

Found in: trench A, find-group 33.

[Fig. 6d](#)

*Sgraffito with Concentric Circles (second half of thirteenth – early fourteenth century)*

69. [BZY559] Part of bowl. Estimated rim diameter: 0.17 m. Estimated base diameter: 0.07 m. Height: 0.068 m. Two mended pieces preserve part of flat base, flaring body and carinated rim (complete profile). Fabric: 2.5YR 6/4 (light reddish brown), with many small-to-large white and brown inclusions and many small-to-large voids. White slip and yellow-green shiny glaze inside and over rim outside. Inside, incised concentric circles on rim and lower body. Exterior bare.

Found in: trench A, find-group 32.

[Fig. 13a](#)

*Ottoman Sgraffito Ware (fifteenth – sixteenth century)*

70. [BZY558] Bowl, base fragment. Estimated base diameter: 0.09 m. Preserved height: 0.022 m. About half of low squared ring-foot preserved. Fabric: 2.5YR 6/8 (light red), with few small-to-medium white inclusions and some small-to-medium voids. Inside, white slip and incised decoration with radiating and curved lines. Traces of glaze preserved in the incision. Wash outside.

Found in: trench A, find-group 13.

[Fig. 12g](#)

**C. Chalcis – *intra muros***

*Tripod stilts*

71. [BZY749] Vaki Street. Tripod stilt. Length: 0.084 m. Width: 0.027 m. Small part missing. Fabric: fine, clean, 2.5YR 6/6 (light red), with rare small voids. Traces of dark-brown glaze.
72. [BZY750] Erotokritou, Olynthou and Skalkota Streets. Tripod stilt. Length: 0.073 m. Width: 0.025 m. Small part missing. Fabric: fine, clean, 5YR 7/4 (pink), with rare small voids. Traces of dark-brown glaze. Found in: trench 1, find-group 121, 13th–14th century.
73. [BZY751] Charonda Street. Tripod stilt. Length: 0.086 m. Width: 0.015 m. Small part missing. Fabric: c.7.5YR 5.2 (brown). Over-fired.

*Green and Brown Painted Ware (c.mid-twelfth century – 1200)*

74. [BZY754] Agia Varvara Square. Bowl, rim and body fragment. Estimated rim diameter: 0.22 m. Preserved height: 0.055 m. Small part of vertical upper body and outwardly thickened rim with flat lip. Fabric: 2.5YR 5/6 to 6/6 (red to light red), with rare small white inclusions and rare small voids. White slip and colourless glaze inside and on lip. Spirals in dark brown and green on rim inside. Wash outside. (Green and Brown Painted Ware II.)

[Fig. 8e](#)

*Fine Sgraffito Ware (c.mid-twelfth – early thirteenth century)*

75. [BZY753] Agia Varvara Square. Bowl, base fragment. Estimated base diameter: 0.10 m. Preserved height: 0.02 m. Part of disc base preserved. Fabric: 2.5 YR 5/6 to 6/6 (red to light red), with some small white inclusions and some small voids. White slip on both sides, including the underside of base. Inside, colourless glaze and incised vegetal decoration (decoration similar to Hayes 1992, pl. 11a).

[Fig. 10e](#)

*Incised Sgraffito (c.second half of twelfth – mid-thirteenth century)*

76. [BZY755] Agia Varvara Square. Bowl, base and body fragment. Estimated base diameter: 0.12 m. Preserved height: 0.053 m. Almost half ring-base and small part of rounded lower body preserved. Fabric: 2.5YR 6/6 to 7/4 (light red to light reddish brown), with rare small white inclusions and some small-to-medium voids. Inside, pale-yellowish slip and pale-yellow shiny glaze. Part of an incised bird surrounded by linear designs. Exterior bare. (Free Style.)

[Fig. 11g](#)

77. [BZY752] Epimelitirio Plot. Bowl, base and body fragment. Base diameter: 0.048 m. Preserved height: 0.018 m. Entire disc base and small part of rounded lower wall preserved. Fabric: 5YR 6/6 (reddish yellow), with rare small white inclusions and rare small voids. White slip and pale-yellowish glaze on both sides, including the underside of base. Inside, little cone at the centre with an incised figural representation.<sup>14</sup>  
[Fig. 10h](#)

#### CHEMICAL ANALYSIS AND CLASSIFICATION OF SAMPLES ACCORDING TO CHEMICAL COMPOSITION

Chemical analysis of the samples was carried out by Wavelength Dispersive – X Ray Fluorescence (WD-XRF) at the ‘Laboratoire de Céramologie’ in Lyon (*e.g.* Waksman 2011); 24 elements are quantified, 17 of which are usually taken as active variables in multivariate statistical treatments used to classify ceramics into groups of similar chemical composition. These include eight major and minor elements in ceramics (MgO, Al<sub>2</sub>O<sub>3</sub>, SiO<sub>2</sub>, K<sub>2</sub>O, CaO, TiO<sub>2</sub>, MnO, Fe<sub>2</sub>O<sub>3</sub>) and nine trace elements (V, Cr, Ni, Zn, Rb, Sr, Zr, Ba, Ce).

Classification of samples was obtained by hierarchical clustering analysis applied to standardised data, using Euclidean distance and average linkage (*e.g.* Picon 1984). The corresponding diagram, called a dendrogram, initially represents each sample as a vertical bar at the bottom of the figure ([Fig. 14](#), [Fig. 15](#)). The two samples the most alike in elemental composition are connected by a horizontal link, which lies all the lower as the samples are chemically similar. The two samples are then fused into a ‘pseudo sample’ of average composition. The same process is repeated, with the linkage being formed at growing heights, until all the samples are connected. The resulting diagram constitutes the dendrogram. It shows clusters of samples of similar composition linked at a lower level, all the clusters being ultimately linked together at the top of the diagram. This representation is, however, not sufficient in itself to define compositional groups, as it cannot give expression to the significance of elemental differences between clusters. Further examination of the raw data is still needed in order to be able to interpret classifications in terms of pottery productions and workshops (Picon 1993).

#### RESULTS AND DISCUSSION

The classification of our samples from Thebes and Chalcis according to their chemical compositions is shown in [Fig. 14](#) (see also [Table 1](#)). Two main groups may be distinguished, one of them having a possible substructure. Three samples, two from Thebes (catalogue nos. **42**, **45** BZY500, 527, [Fig. 13b–c](#)) and one from Chalcis (catalogue no. **69** BZY559, [Fig. 13a](#)) are not part of any of the two groups. Another sherd from Chalcis is a chemical outlier to the whole sampling, and is not shown in the classification (catalogue no. **52** BZY549, [Fig. 13d](#), [Table 2](#), see below ‘Novy Svet Ware’). The location of the reference samples in the dendrogram (solid [red] symbols in [Fig. 14](#), top) indicates that the two main groups correspond to the pottery production of Thebes and Chalcis, respectively. In the framework of analytical studies of ceramics of various periods from Chalcis and especially from Thebes (*e.g.* Catling and Millet 1965; Asaro and Perlman 1973; Catling and Jones 1977; Popham, Hatcher and Pollard 1980; 1983; Jones 1986; Tomlinson 2000; Mommsen *et al.* 2002; Schwedt *et al.* 2006), these two groups constitute, as far as we know, the first chemical reference groups for the two cities based on kiln furniture and pottery wasters.

They are very different from one another from a chemical viewpoint ([Table 1](#), [Fig. 16](#)). Unlike the Chalcis group, the group of Thebes has clear ultrabasic features, with high percentages of

<sup>14</sup> Close parallels for this style are known only from Thebes (unpublished, displayed in the New Museum). The incised decoration bears some similarity to some sgraffito examples attributed to Cyprus: *e.g.* François 1999, 112, 121–2, pl. 13 nos. 299–300.

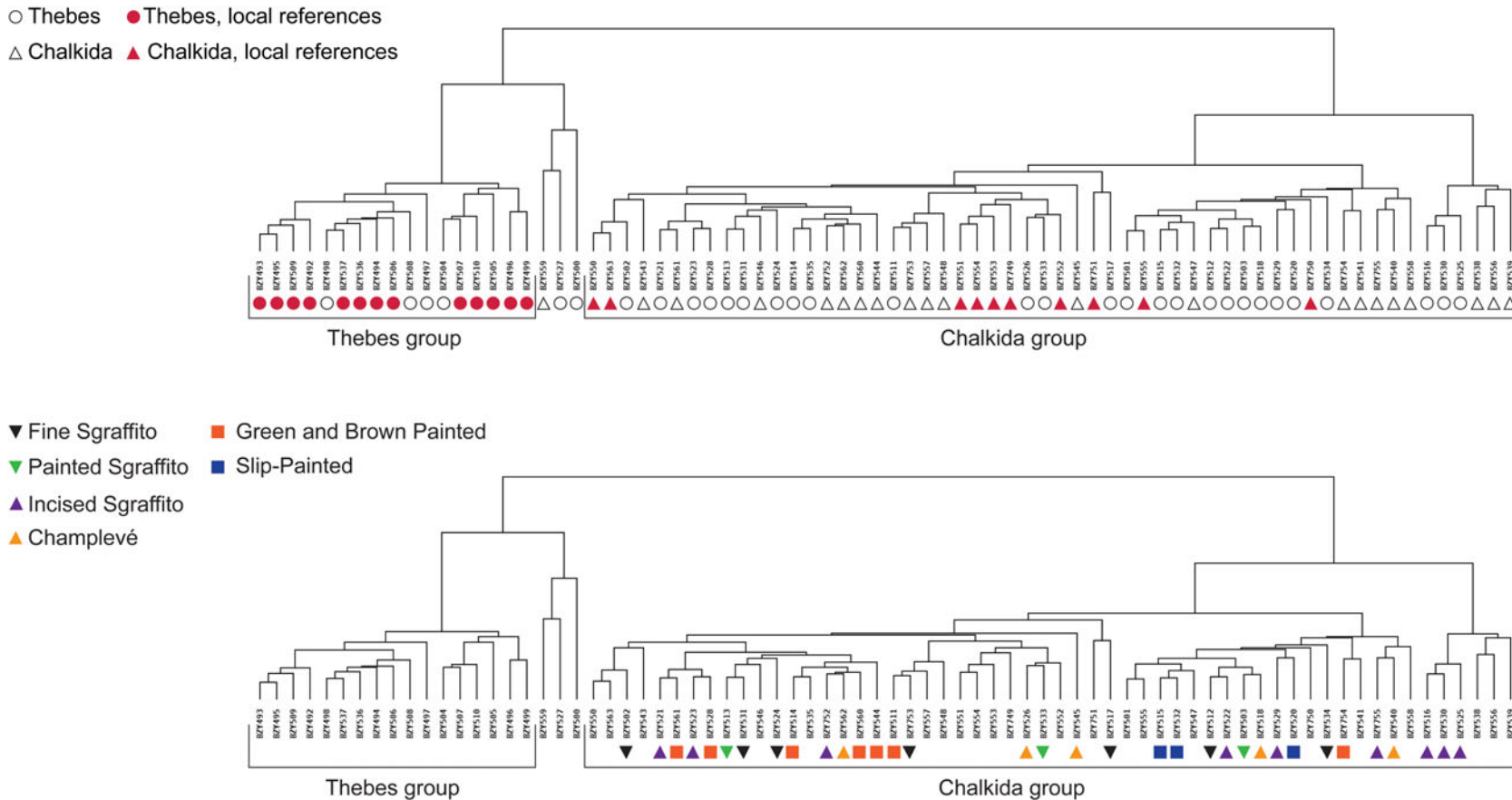


Fig. 14. Classification according to chemical compositions of ceramics from Thebes and Chalcis (Chalkida). Samples are identified by their laboratory number. Symbols indicate: (top) the city where samples come from, reference samples (tripod stilts and pottery wasters) being pointed out; (bottom) the type of samples, for those belonging to the main ‘Middle Byzantine Production’ (MBP). The main compositional groups are underlined.

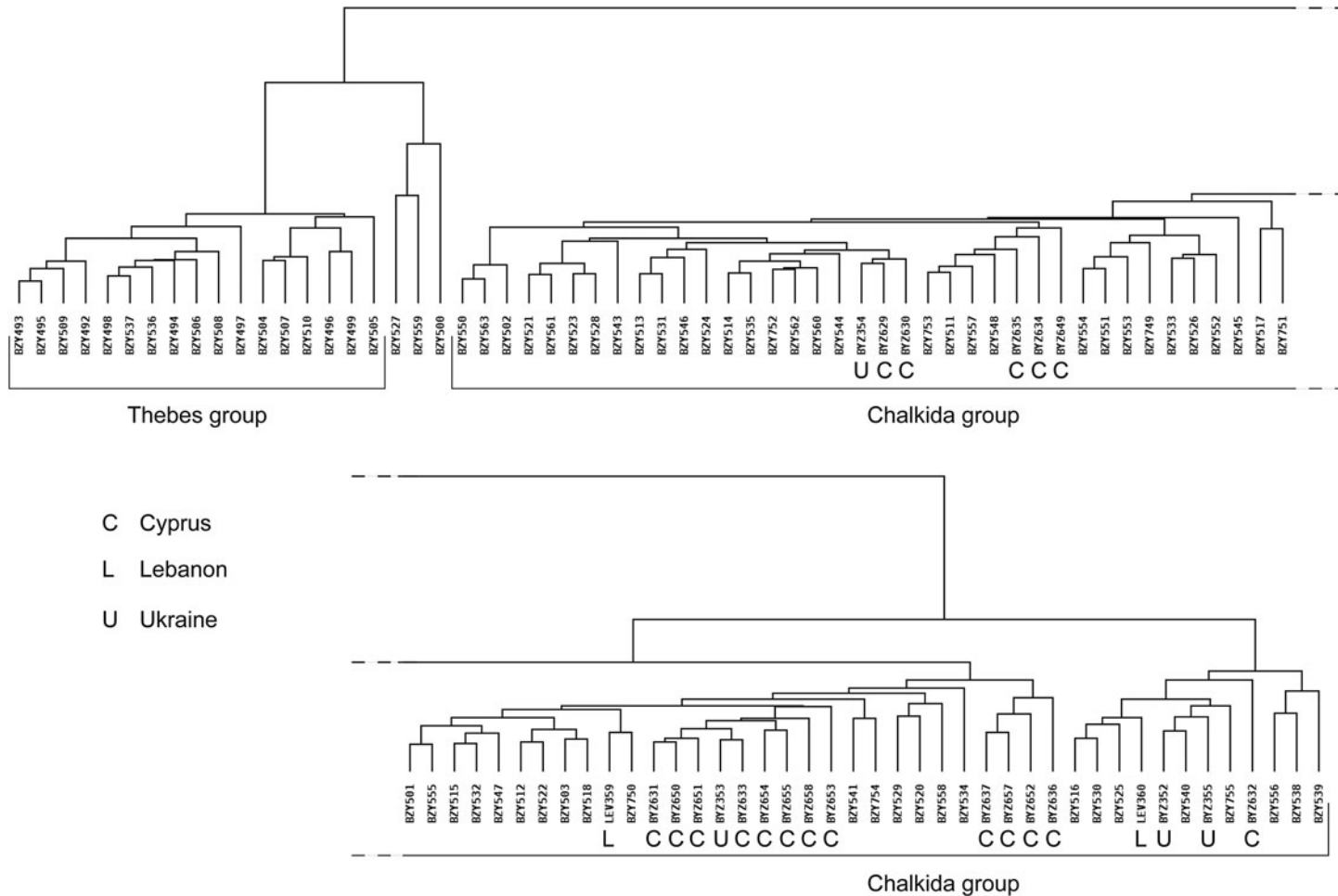


Fig. 15. Classification according to chemical compositions of ceramics from Thebes and Chalcis (Chalkida), together with comparative material for the main ‘Middle Byzantine Production’ (Waksman and Wartburg 2006). Samples are identified by their laboratory number, and by letters for samples coming from Paphos and Kouklia (Cyprus), Chersonesos (Ukraine) and Tell Arqa (Lebanon). The main compositional groups are underlined.

Table 1 Chemical compositions of samples from Thebes and Chalcis; samples ranked as in the classification (Fig. 14). Major and minor elements are given in oxides weight %, trace elements in parts per million (ppm); m: mean,  $\sigma$ : standard deviation, ld: detection limit. Elements between brackets are indicative; data with an asterisk were not taken into account in the calculation of **m** and  **$\sigma$** .

	CaO	Fe <sub>2</sub> O <sub>3</sub>	TiO <sub>2</sub>	K <sub>2</sub> O	SiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub>	MgO	MnO	(Na <sub>2</sub> O)	(P <sub>2</sub> O <sub>5</sub> )	Zr	Sr	Rb	Zn	Cr	Ni	(La)	Ba	V	Ce
<b>Thebes group, local production</b>																				
BZY493	9.57	7.48	0.743	2.15	59.38	12.94	6.79	0.1113	0.37	0.21	133	142	89	96	515	565	<ld	261	122	60
BZY495	9.83	7.45	0.741	2.16	59.21	12.92	6.73	0.1131	0.35	0.22	133	146	87	96	517	555	<ld	304	128	60
BZY509	9.22	7.51	0.743	2.16	59.64	12.95	6.65	0.1157	0.45	0.24	138	142	91	92	530	567	<ld	298	118	59
BZY492	9.84	7.56	0.726	2.17	58.52	12.71	7.38	0.1089	0.42	0.25	135	144	88	95	494	601	<ld	275	126	52
BZY498	9.38	7.31	0.700	2.05	60.11	12.25	7.02	0.1113	0.45	0.24	130	133	82	92	499	590	<ld	281	124	56
BZY537	9.33	7.30	0.716	2.07	59.88	12.38	6.98	0.1092	0.51	0.25	132	138	83	93	543	569	<ld	266	118	52
BZY536	9.07	7.31	0.715	2.05	60.22	12.43	6.92	0.1089	0.50	0.27	142	135	85	89	563	569	<ld	246	113	55
BZY494	9.70	7.19	0.686	1.83	60.65	11.51	7.17	0.1075	0.59	0.30	134	139	77	91	584	641	<ld	276	113	53
BZY506	9.98	7.12	0.716	2.04	60.35	12.22	6.58	0.1087	0.38	0.25	132	141	84	89	541	538	<ld	282	115	45
BZY508	9.57	7.16	0.694	1.96	60.46	11.79	7.16	0.1104	0.54	0.25	137	135	79	82	519	591	<ld	268	108	49
BZY497	9.92	7.45	0.709	2.06	59.11	12.28	7.28	0.1164	0.48	0.26	131	141	82	95	541	614	<ld	277	116	32
BZY504	10.09	7.04	0.722	1.95	60.69	11.87	6.30	0.1051	0.55	0.17	145	135	78	81	525	487	<ld	271	107	51
BZY507	9.30	6.92	0.724	1.90	61.76	11.83	6.46	0.1002	0.55	0.17	148	138	79	81	550	476	<ld	251	115	47
BZY510	9.59	7.03	0.725	1.95	61.17	11.91	6.47	0.0994	0.57	0.24	148	142	79	84	534	509	<ld	253	114	63
BZY505	10.94	7.00	0.735	1.93	60.39	12.35	5.70	0.0985	0.37	0.21	144	150	82	93	503	527	<ld	266	112	71
BZY496	8.35	7.29	0.763	2.11	59.80	12.96	6.20	0.1017	*2.00	0.19	141	132	86	82	458	489	<ld	272	120	50
BZY499	8.46	7.29	0.752	2.05	61.60	12.76	6.08	0.1034	0.46	0.20	143	128	89	90	587	503	<ld	281	130	53
<b>m</b>	<b>9.54</b>	<b>7.26</b>	<b>0.724</b>	<b>2.03</b>	<b>60.17</b>	<b>12.36</b>	<b>6.70</b>	<b>0.1076</b>	<b>0.47</b>	<b>0.23</b>	<b>138</b>	<b>139</b>	<b>84</b>	<b>89</b>	<b>530</b>	<b>552</b>	<b>&lt;ld</b>	<b>272</b>	<b>118</b>	<b>53</b>
<b><math>\sigma</math></b>	<b>0.60</b>	<b>0.19</b>	<b>0.021</b>	<b>0.10</b>	<b>0.87</b>	<b>0.46</b>	<b>0.46</b>	<b>0.0055</b>	<b>0.08</b>	<b>0.04</b>	<b>6</b>	<b>6</b>	<b>4</b>	<b>5</b>	<b>32</b>	<b>48</b>		<b>15</b>	<b>7</b>	<b>8</b>
<b>outliers</b>																				
BZY559	9.10	7.26	0.748	2.89	54.62	15.40	6.80	0.1073	0.99	0.31	171	164	121	104	430	295	34	392	121	66
BZY527	8.95	7.45	0.838	3.02	58.24	15.81	4.30	0.0979	0.81	0.14	174	177	135	108	390	323	44	478	116	64
BZY500	9.10	7.48	0.830	3.02	57.89	16.14	4.45	0.0879	0.54	0.21	164	237	139	125	372	315	37	514	135	72
<b>Chalcis group, local production</b>																				
BZY550	6.21	7.28	0.825	3.69	56.49	19.65	2.75	0.1232	1.70	0.15	176	111	152	105	155	114	44	614	124	82
BZY563	6.76	7.21	0.837	3.63	57.12	19.45	2.75	0.1240	1.60	0.16	177	117	149	104	165	118	<ld	627	125	78
BZY502	5.85	7.27	0.838	3.53	58.06	19.30	2.38	0.1210	1.37	*1.00	173	109	149	105	143	109	<ld	639	129	81
BZY543	6.05	7.76	0.836	3.73	58.20	19.17	2.42	0.1169	1.33	0.16	167	98	149	105	199	130	37	615	127	72

Continued

Table I Continued

	CaO	Fe <sub>2</sub> O <sub>3</sub>	TiO <sub>2</sub>	K <sub>2</sub> O	SiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub>	MgO	MnO	(Na <sub>2</sub> O)	(P <sub>2</sub> O <sub>5</sub> )	Zr	Sr	Rb	Zn	Cr	Ni	(La)	Ba	V	Ce
BZY521	5.21	7.59	0.854	3.69	58.26	20.13	2.46	0.1192	1.23	0.15	169	101	158	103	148	103	44	623	144	71
BZY561	5.25	7.59	0.850	3.85	57.95	19.73	2.85	0.1185	1.39	0.22	168	110	152	102	206	140	36	579	145	74
BZY523	4.81	7.68	0.847	3.75	58.52	20.27	2.45	0.1196	1.20	0.15	157	99	157	103	146	111	<ld	639	142	64
BZY528	4.85	7.80	0.863	3.78	57.84	20.54	2.54	0.1230	1.27	0.17	163	102	160	103	165	103	41	663	145	65
BZY513	5.15	7.57	0.858	3.67	58.47	19.99	2.48	0.1190	1.25	0.25	170	106	155	105	147	106	<ld	668	142	81
BZY531	4.64	7.47	0.863	3.61	59.07	20.02	2.47	0.1165	1.39	0.16	169	106	158	107	140	109	40	645	136	78
BZY546	4.89	7.36	0.829	3.84	58.48	19.73	2.55	0.1138	1.38	0.15	166	103	153	104	154	99	32	603	129	86
BZY524	4.09	7.51	0.845	3.74	59.77	19.70	2.47	0.1188	1.39	0.17	165	93	153	99	151	115	38	642	138	91
BZY514	4.87	7.54	0.862	3.72	58.51	20.23	2.48	0.1203	1.26	0.19	162	109	158	99	153	115	50	705	147	88
BZY535	5.29	7.63	0.860	3.75	57.89	20.28	2.56	0.1177	1.27	0.15	169	105	157	103	150	104	40	669	149	89
BZY752	5.40	7.61	0.839	3.78	56.58	20.48	2.53	0.1217	1.19	0.15	168	101	159	106	158	101	37	624	147	88
BZY562	5.18	7.71	0.865	3.86	57.68	20.42	2.54	0.1203	1.25	0.17	168	99	162	107	153	104	47	629	142	81
BZY560	5.73	7.53	0.863	3.80	57.23	20.29	2.48	0.1201	1.41	0.16	169	104	157	103	159	106	39	633	140	91
BZY544	4.94	7.72	0.870	3.85	58.12	20.25	2.43	0.1254	1.29	0.15	175	101	155	108	159	107	33	619	139	95
BZY511	5.71	7.91	0.869	3.84	56.31	21.00	2.65	0.1235	1.16	0.13	155	104	161	111	152	111	42	631	154	76
BZY753	5.25	7.95	0.867	3.95	56.87	20.93	2.47	0.1240	1.14	0.17	158	101	166	112	168	109	39	650	146	72
BZY557	5.60	7.93	0.855	3.95	56.19	20.81	2.84	0.1210	1.31	0.16	159	117	167	107	154	111	<ld	657	150	72
BZY548	5.73	7.62	0.849	4.09	56.82	20.29	2.83	0.1188	1.24	0.20	159	119	159	109	141	102	55	637	147	68
BZY551	5.29	7.50	0.849	3.95	57.48	20.08	2.76	0.1279	1.56	0.19	169	112	155	107	150	113	<ld	643	130	83
BZY554	5.50	7.68	0.844	3.90	56.79	20.59	2.72	0.1306	1.47	0.17	158	107	161	110	158	107	44	662	131	85
BZY553	5.38	7.56	0.829	4.03	56.35	20.95	2.66	0.1236	1.61	0.27	149	111	168	113	140	107	37	658	131	84
BZY749	5.66	7.93	0.852	4.02	55.91	20.96	2.77	0.1349	1.36	0.13	153	107	167	111	150	113	57	656	137	92
BZY526	4.54	7.84	0.850	3.86	57.70	20.74	2.68	0.1281	1.29	0.17	153	106	163	107	161	105	<ld	676	130	67
BZY533	5.23	7.95	0.877	3.83	56.65	21.04	2.64	0.1234	1.27	0.16	159	101	163	112	167	117	59	651	133	65
BZY552	5.47	7.84	0.835	4.04	55.88	21.00	2.88	0.1309	1.48	0.14	152	106	167	111	143	109	<ld	649	128	69
BZY545	5.26	7.45	0.857	3.88	57.16	20.52	2.58	0.1170	1.47	0.39	168	111	160	122	150	110	<ld	615	139	78
BZY751	6.25	7.68	0.844	3.88	56.16	20.59	2.68	0.1310	1.31	0.14	156	107	162	112	139	101	38	661	160	94
BZY517	4.74	8.29	0.869	3.95	56.54	21.53	2.66	0.1268	0.91	0.17	145	102	169	114	151	130	<ld	685	150	94
BZY501	4.62	7.18	0.842	3.47	60.57	19.00	2.45	0.1192	1.30	0.21	176	105	146	100	152	119	39	635	135	75
BZY555	5.23	7.13	0.833	3.39	60.22	18.59	2.51	0.1173	1.67	0.14	177	99	138	97	153	107	43	574	135	75
BZY515	4.63	7.49	0.852	3.67	59.30	19.90	2.47	0.1195	1.17	0.15	174	99	155	102	150	111	40	648	131	75
BZY532	4.32	7.37	0.856	3.58	59.89	19.64	2.35	0.1177	1.50	0.15	179	99	151	100	154	98	43	601	135	74
BZY547	4.51	7.45	0.843	3.81	59.29	19.59	2.51	0.1181	1.52	0.16	177	99	153	93	153	109	42	607	136	71
BZY512	4.72	7.26	0.843	3.57	59.35	19.55	2.40	0.1159	1.37	0.16	182	95	151	99	147	101	<ld	602	135	92

Continued



Table 1 Continued

	CaO	Fe <sub>2</sub> O <sub>3</sub>	TiO <sub>2</sub>	K <sub>2</sub> O	SiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub>	MgO	MnO	(Na <sub>2</sub> O)	(P <sub>2</sub> O <sub>5</sub> )	Zr	Sr	Rb	Zn	Cr	Ni	(La)	Ba	V	Ce
BZY522	4.89	7.17	0.842	3.54	59.57	19.37	2.34	0.1144	1.54	0.17	176	100	148	102	144	106	<ld	591	131	85
BZY503	4.70	7.11	0.862	3.45	60.37	19.16	2.43	0.1146	1.39	0.23	195	104	146	98	144	109	44	635	132	81
BZY518	5.13	7.03	0.849	3.43	60.35	18.89	2.40	0.1146	1.41	0.18	189	102	143	97	153	113	32	561	135	89
BZY529	5.33	7.24	0.838	3.55	58.97	19.21	2.89	0.1150	1.45	0.16	179	108	150	102	190	127	42	659	122	75
BZY520	4.26	7.21	0.853	3.59	60.49	19.29	2.38	0.1157	1.35	0.17	180	101	148	97	151	104	32	655	117	64
BZY750	5.98	6.98	0.847	3.47	59.26	18.68	2.62	0.1207	1.41	0.19	199	116	145	99	151	108	47	621	130	72
BZY534	5.42	7.22	0.848	3.51	58.58	19.45	2.40	0.1197	1.51	0.28	181	97	149	103	149	99	47	607	136	57
BZY754	6.18	7.11	0.854	3.58	58.90	19.11	2.27	0.1158	1.32	0.32	182	119	148	97	138	92	40	619	143	96
BZY541	6.12	6.96	0.821	3.67	59.22	18.59	2.45	0.1095	1.59	0.23	174	109	143	93	151	114	<ld	605	133	92
BZY755	5.20	6.83	0.844	3.57	60.54	18.46	2.55	0.1155	1.39	0.24	201	121	140	111	145	105	40	602	124	86
BZY540	4.89	6.83	0.843	3.53	60.53	18.55	2.34	0.1132	1.59	0.20	197	103	140	99	147	101	47	588	121	83
BZY558	5.41	7.02	0.839	4.02	59.23	18.93	2.43	0.1129	1.59	0.23	179	102	144	100	145	93	51	613	114	89
BZY516	5.21	6.72	0.848	3.28	61.46	18.29	2.26	0.1122	1.46	0.15	215	97	136	92	141	99	42	565	116	74
BZY530	5.23	6.63	0.855	3.25	61.34	18.06	2.49	0.1123	1.62	0.19	222	109	133	94	152	112	49	585	111	80
BZY525	4.88	6.77	0.854	3.31	61.46	18.34	2.29	0.1143	1.63	0.17	215	98	138	94	145	108	32	572	112	93
BZY538	4.33	6.51	0.804	3.49	63.11	17.38	2.11	0.1027	1.65	0.21	194	102	131	94	146	92	<ld	572	125	82
BZY556	4.15	6.57	0.825	3.37	62.94	17.78	2.24	0.1080	1.58	0.27	188	101	136	97	143	102	41	555	109	74
BZY539	3.43	6.36	0.837	3.44	64.08	17.45	2.16	0.1064	1.72	0.18	216	103	131	86	137	92	33	583	108	66
<b>m</b>	<b>5.17</b>	<b>7.38</b>	<b>0.848</b>	<b>3.70</b>	<b>58.68</b>	<b>19.68</b>	<b>2.52</b>	<b>0.1190</b>	<b>1.40</b>	<b>0.19</b>	<b>174</b>	<b>105</b>	<b>152</b>	<b>103</b>	<b>153</b>	<b>108</b>	<b>42</b>	<b>625</b>	<b>134</b>	<b>80</b>
<b>σ</b>	<b>0.62</b>	<b>0.42</b>	<b>0.014</b>	<b>0.21</b>	<b>1.90</b>	<b>0.98</b>	<b>0.18</b>	<b>0.0062</b>	<b>0.17</b>	<b>0.05</b>	<b>17</b>	<b>6</b>	<b>10</b>	<b>7</b>	<b>13</b>	<b>9</b>	<b>7</b>	<b>34</b>	<b>12</b>	<b>10</b>

Table 2 Comparative chemical data for MBP, Lefkandi brick and 'Novy Svet Ware'. Major and minor elements are given in oxides weight %, trace elements in parts per million (ppm); m: mean,  $\sigma$ : standard deviation, n: number of samples, ld: detection limit. Elements between brackets are indicative.

	CaO	Fe <sub>2</sub> O <sub>3</sub>	TiO <sub>2</sub>	K <sub>2</sub> O	SiO <sub>2</sub>	Al <sub>2</sub> O <sub>3</sub>	MgO	MnO	(Na <sub>2</sub> O)	(P <sub>2</sub> O <sub>5</sub> )	Zr	Sr	Rb	Zn	Cr	Ni	(La)	Ba	V	Ce
<b>Chalkida group, local production (n = 56, this work)</b>																				
m	5.17	7.38	0.848	3.70	58.68	19.68	2.52	0.1190	1.40	0.19	174	105	152	103	153	108	42	625	134	80
$\sigma$	0.62	0.42	0.014	0.21	1.90	0.98	0.18	0.0062	0.17	0.05	17	6	10	7	13	9	7	34	12	10
min	3.43	6.36	0.804	3.25	55.88	17.38	2.11	0.1027	0.91	0.13	145	93	131	86	137	92	32	555	108	57
max	6.76	8.29	0.877	4.09	64.08	21.53	2.89	0.1349	1.72	0.39	222	121	169	122	206	140	59	705	160	96
<b>Main 'Middle Byzantine Production' (MBP) group (n = 24, Waksman and Wartburg 2006)</b>																				
m	5.16	7.19	0.850	3.81	58.78	19.65	2.46	0.1148	1.49	0.17	182	121	146	103	143	108	41	661	138	82
$\sigma$	0.57	0.37	0.013	0.17	1.33	0.78	0.12	0.0039	0.15	0.02	16	18	9	6	7	6	3	39	8	4
<b>Lefkandi brick (Lyon unpublished)</b>																				
BYZ993	5.03	6.61	0.804	3.21	62.92	17.52	2.19	0.1135	1.29	0.14	184	92	134	98	141	87	47	564	118	78
<b>outlier from Chalkida, 'Novy Svet Ware' (this work, not included in Fig. 14)</b>																				
BZY549	8.21	6.90	0.821	2.61	59.91	16.78	3.00	0.0689	1.38	0.15	161	273	118	88	133	78	<ld	365	133	65
<b>'Novy Svet Ware' group (n = 44, Waksman and Teslenko 2010)</b>																				
m	7.42	7.25	0.829	2.73	59.17	17.34	3.16	0.0658	1.59	0.21	157	284	123	94	136	82	35	372	141	75
$\sigma$	1.21	0.57	0.036	0.14	1.59	0.70	0.36	0.0045	0.21	0.21	7	30	9	8	8	7	16	18	14	6

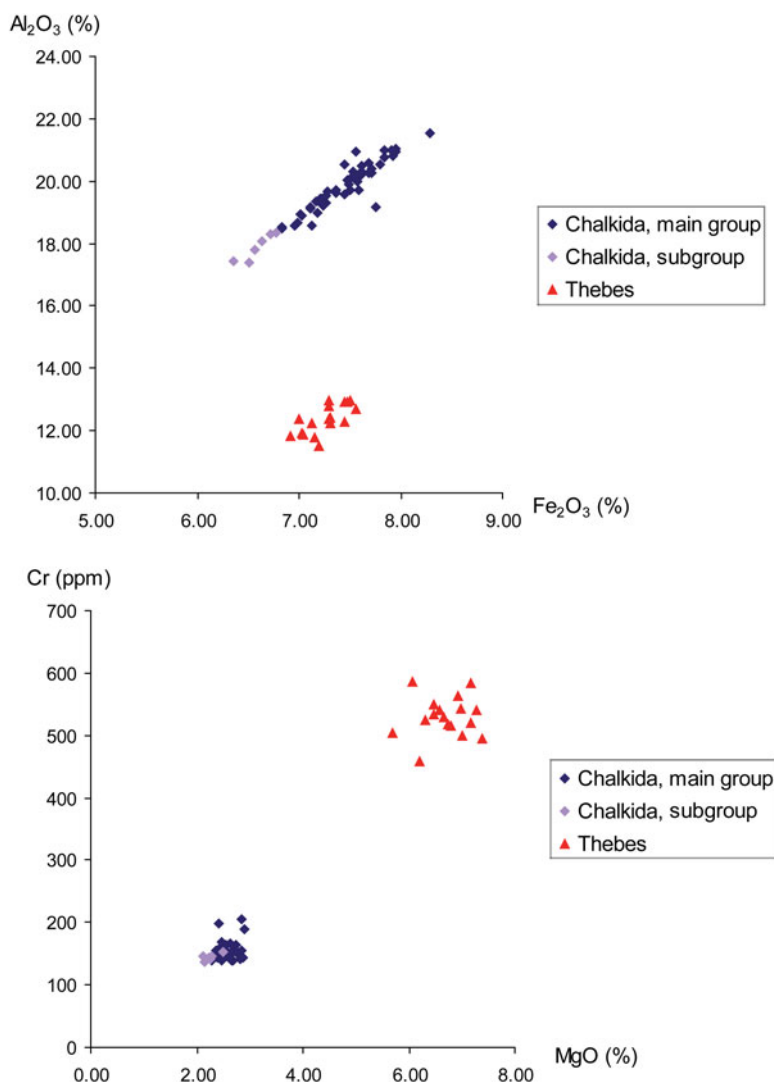


Fig. 16. Binary plots aluminium–iron and magnesium–chromium. Thebes and Chalcis (Chalkida) groups are clearly differentiated. Chalcis group, including its subgroup in the classification (Fig. 14), shows a variability which corresponds to co-variations of elements; its samples belong to the same geochemical ensemble. The high concentrations of magnesium and chromium in Thebes group may be related to ultrabasic formations.

magnesium, chromium and nickel (Fig. 16, bottom). It also has lower contents of aluminium (Fig. 16, top), potassium and rubidium, zirconium, barium, rare earth elements, *etc.* The binary plot aluminium–iron (Fig. 16, top) indicates that the substructure within Chalcis group, which appears on the right-hand side of the dendrogram (Fig. 14: BZY516, 530, 525, 538, 556, 539; see also Table 1), is probably not significant. It corresponds to samples showing the same geochemical behaviour, illustrated in Fig. 16 (top) by a continuous correlation between aluminium and iron in the main group and in the subgroup.

Samples included in the Thebes and Chalcis chemical groups (Fig. 14) enable us to identify the corresponding local repertoire, or at least its representatives within our sampling. The group of Thebes (Figs. 3–4) consists of tripods, unfinished wares ('Sgraffito with Concentric Circles', wares with impressed decoration) and a few finished products, which again consist of 'Sgraffito with Concentric Circles' (examples typologically similar to biscuit-fired wasters, catalogue nos. 7–8, 12). They all belong to the thirteenth and fourteenth centuries with no earlier specimens.

One of the finished samples, whose thin walls, shiny brown glaze and external tongues of slip remind one of the so-called ‘Novy Svet Ware’ (Waksman and François 2004–5; Waksman and Teslenko 2010), is in fact part of the Thebes chemical group (catalogue no. **9** BZY504, Fig. 4f). ‘Novy Svet Ware’ itself also occurs in the same contexts, as one example is present in our samples found in Chalcis (catalogue no. **52** BZY549, Fig. 13d). But its chemical features may easily be differentiated from those of Thebes and Chalcis products (Table 2).

The chemical group of Chalcis (Figs. 6–12) includes, on the one hand, all samples of various dating (from Middle Byzantine to Ottoman, including all the MBP) taken from Chalcis, except for a single Sgraffito with Concentric Circles (catalogue no. **69** BZY559, Fig. 13a), which does not belong to any of the two groups, and for the sherd of ‘Novy Svet Ware’ (catalogue no. **52** BZY549, Fig. 13d). On the other hand, all MBP samples taken from Thebes, along with a plain glazed (catalogue no. **44** BZY501, Fig. 6f) and a monochrome sgraffito (catalogue no. **43** BZY535, Fig. 12f), form part of this chemical group. Examples of fabric of each group are shown in Fig. 5 (bottom), MBP fabric being described in detail in Sanders 1995.

Following the discussion from previous studies of MBP (Blackman and Redford 2005; Waksman and Wartburg 2006), we conclude also in this case that the Chalcis chemical group mixes all the different types which constitute MBP (Fine Sgraffito Ware, Painted Fine Sgraffito Ware, Incised/Aegean Ware, Slip-Painted Ware, Green and Brown Painted Ware ..., Fig. 14 [bottom], Fig. 5e–j, Figs. 8–11, Fig. 12a–d). This is a long-term production (at least from the beginning/mid-twelfth to the mid-thirteenth century, and possibly until the beginning of the fourteenth century) in various decoration techniques. Provided that the chemical composition of this group is specific to Chalcis, a point we will come back to, the classification shows that MBP was produced locally.

Although this result does not exclude the possibility that other workshops – such as Corinth – may have manufactured similar wares as well, the next classification (Fig. 15) supports the role of Chalcis as the provider of MBP all around the Mediterranean and beyond. Samples of MBP from Cyprus, Lebanon and the Crimea (Waksman and Wartburg 2006)<sup>15</sup> are matched to the Chalcis chemical group, including its subgroup, irrespective of their type and of the site where they were found. Samples of MBP coming from western Anatolian sites (Pergamon, Ephesos, Kadıkalesi/Anaia: Waksman and Spieser 1997; Waksman 2013; Waksman forthcoming), not shown in Fig. 15, also correspond to the same chemical group. Chemical compositions of examples found in Corinth (White, Jackson and Sanders 2006: Phyllite group D) and in Kinet Höyük (Blackman and Redford 2005: group 1) analysed in other laboratories are in reasonably good agreement (see also Waksman and Wartburg 2006 for a discussion of previous MBP data). The results clearly show that it is Chalcis’ products which correspond to the main widespread and long-lasting production that we defined as MBP.

Furthermore, our material indicates that Chalcis also manufactured a series of types that appear there for the first time in the thirteenth century along with the use of tripod stilts (Papanikola-Bakirtzis 1986), such as the Plain, Painted or Partially Glazed Wares (catalogue nos. **53–58**, **67–68** BZY538–539, 541, 543, 547–548, 556–557, Figs. 6a–e, 7) and the Sgraffito with Concentric Circles Wares (catalogue no. **51** BZY546, Fig. 12h). This seems to have continued in later centuries, though evidence from a single sample (catalogue no. **70** BZY558, Fig. 12g) is hardly adequate to substantiate this hypothesis.

The close vicinity of the city itself is not a likely origin for the clay used to manufacture the MBP, as Medieval (and modern) Chalcis at least partly sits on ultrabasic rocks (*Geological Map of Greece, Halkida sheet*). Such geological formations would show high contents of magnesium, chromium and nickel, features we do not observe in the Chalcis group. It is more likely that the clay came from the nearby Lelantine plain, exploited until recently by the potters of modern Chalcis (Jones 1986, 144–6, 867–8), and where extensive clay quarrying took place, especially in the Vasilikos area (*Geological map of Greece, Halkida sheet*). Exploitation of clays of the Lelantine plain may have gone back as far as the Bronze Age, as it was already used at the site of Lefkandi

<sup>15</sup> The outliers of the 2006 paper were not included in this classification.

(Jones 1986, 144). Both bricks and pottery were manufactured from these clays without further treatment (Jones 1986, 144–5, 867–8). The ‘Lefkandi brick’, proposed by R. Jones as a standard for pottery analysis, provides good *comparanda* for the Chalcis chemical group. The chemical composition of ‘Lefkandi brick’ as analysed in Lyon fits samples of the Chalcis chemical group with the lowest contents of aluminium, iron and potassium (Table 2).

Petrographic data would also support our results, as the petrographic features of MBP examples from Corinth (fitting chemically our Chalcis group; White, Jackson and Sanders 2006: group D, ‘Phyllite fabric’) seem compatible with those of the Vasiliiko clays (Matson 1972, quoted in Jones 1986, 144).<sup>16</sup> These clays may be homogeneous within the Lelantine plain, but it is not expected that the associated ‘uncertainty zone’ (Picon 1993) extends much further (Jones 1986, 149–50). We thus consider the Chalcis group to be specific enough for us to conclude that MBP was manufactured in Chalcis or its surroundings, with clay most probably coming from the Lelantine plain.

The study also brings information about the production of Thebes, and about the continuation of ceramic manufacture (made in the same or similar decorative techniques as the MBP) under Frankish rule, *i.e.* after 1204 (see especially Stillwell-MacKay 2003), alongside the appearance of new decorative types. A distinctive type of the second half of the thirteenth and the fourteenth century, which was also widely diffused in the Mediterranean area and the Black Sea, comprises the ‘Sgraffito with Concentric Circles’, identified in previous publications variously as ‘Zeuxippus ware family, imitations, derivatives or subtypes’ (Megaw 1989; François 1995; Vroom 2003; Waksman *et al.* 2008; for this large and controversial group of pottery, see especially Waksman and François 2004–5). Various places of manufacture for productions related to this type have been located on the basis of wasters and chemical analyses, such as Thessaloniki, Mikro Pisto, Paphos, Pergamon, Nicaea, Kadikalesi/Anaia and Constantinople (Megaw and Jones 1983; Waksman and Spieser 1997; Papanikola-Bakirtzis 1999; 2012, 211; Waksman and François 2004–5; Waksman and Girgin 2008; Inanan 2013, 59–74) and some others have been proposed, such as Sparta and North Italy (Armstrong 1992; Berti and Gelichi 1997).

Other related wares, whose production sites are still unlocated, were also defined both typologically and chemically, as for instance the ‘Novy Svet Ware’ named after the Novy Svet shipwreck (Zelenko 1999; Waksman and Teslenko 2010). A large part of Thebes’ pottery repertoire that we present here may be related to the ‘Sgraffito with Concentric Circles’ as well. Further work could investigate the regional characteristics of these wares in Boeotia and Euboea, in a similar way to the north-western Anatolian area for instance. In the latter region, a large number of productions of ‘Sgraffito with Concentric Circles’ has been identified. They are sometimes manufactured in the same workshops as wares more clearly related on stylistical grounds to the Zeuxippus Ware *stricto sensu*, as is the case in Pergamon (Spieser 1996; Patitucci Uggeri 2003; Inanan 2010; see especially Böhlendorf-Arslan 2004 for an update of Spieser’s publication and for a more general view).<sup>17</sup>

The results of the present research may contribute to the discussion of a number of historic, economic and cultural issues. Previous archaeological research concerning twelfth-century Central Greece presented a picture in which Thebes was the primary centre (Koder and Hild 1976, 104; Gerolymatou 1987, 97–112; Louvi-Kizi 2002, 631–2; Koilakou 2013, 183–5) with Chalcis holding a secondary role. The latter was restricted to its function as a trade and naval station for goods produced in or destined for Thebes, such as the purple dye used in the silk industry (Koder 1973, 40–1; Koder and Hild 1976, 102–4; Gerolymatou 1987, 109; Harvey 1989, 219–20). Our ceramic evidence points to the existence of a more complex picture and stronger links between a main consumption centre (Thebes) and its principal manufacturing workshop (Chalcis). Furthermore, the primary role of Thebes as provincial capital may have instigated the circulation of its commodities, *i.e.* the ceramics produced in Chalcis, around the Aegean, the

<sup>16</sup> Ongoing petrographic analyses carried out at the Fitch laboratory, on both MBP examples and Euboean clays, are expected to bring further insight into the question.

<sup>17</sup> We are using here the terminology introduced by Waksman and François (2004–5).

Black Sea and the Eastern Mediterranean. The location of the known shipwrecks carrying as their cargo thousands of MBP ceramics (such as Kastellorizo, Alonissos and Kavalliani) could act as indicators of the naval routes followed by the ships departing from Chalcis towards the open Aegean Sea. This is especially evident in the case of the Kavalliani shipwreck, located in the southern Euboean Gulf. It is reasonable to assume that the ship had probably loaded its cargo in the nearby city before heading towards the southern Aegean. Within this picture, Chalcis emerges as a focal point of an organised maritime network within the Byzantine empire and beyond, centred around the capital Constantinople. The unified economic space of the twelfth-century Byzantine Aegean provided the conditions for the emergence of a limited number of production centres whose commodities were easily distributed on a large scale through naval routes.

It is often accepted that the dismemberment of the Byzantine empire after 1204 brought about major socio-economic changes, witnessed in political and monetary fragmentation, the establishment of feudal rule and estate farming and the active integration of the Aegean into the European trade system (Lock 1995, 240–65; Jacoby 2001, 197–233, esp. 233; Matschke 2002, 763–4, 781, 797–8; Morrisson 2005, 221–32). Nevertheless, our evidence points to the continuity of the MBP production and distribution well into the thirteenth century, despite the new conditions. This may indicate that the transition to the new political reality did not result in radical alterations, at least in everyday life, and that these alterations may have occurred for pottery later in the thirteenth century than has been previously considered (Laiou and Morrisson 2007, 166, 184–8; Papanikola-Bakirtzis 2012). It is noticeable that the production and diffusion of the MBP continued on a large scale in Chalcis: the types of MBP found as cargo in shipwrecks both pre- and post-date the beginning of the thirteenth century, and some still exist at the beginning of the fourteenth century according to Kinet's contexts (Blackman and Redford 2005, 88, 96). The history of Chalcis in these periods was defined by the increasing involvement of Venice in both its political and economic evolution, being located ideally for the Serenissima's maritime and commercial interests. The suggested continuity in MBP forms and fabrics may imply a scheme of 'Byzantine craftsmen – Latin patrons', *i.e.* local craftsmen responding to the demands of Venetian traders who now controlled the distribution network, a case proposed by Mercangöz in a recent publication for the western Anatolian site of Kadikalesi/Anaia (Mercangöz 2013c, 170–4). Our evidence, though relatively meagre for the later periods, indicates the continuation of local ceramic production in the following centuries, under both Venetian and Ottoman rule, though perhaps on a more regional level and next to a multitude of imports from various other Mediterranean centres.

In the meantime, the political fragmentation of feudal Greece after 1204 eventually brought about the decentralisation of ceramic production, with local provincial workshops springing up and starting large-scale production of wares with new distinctive characteristics (François and Spieser 2002, 603–6; Papanikola-Bakirtzis 2003, 64; 2012; Laiou and Morrisson 2007, 184–8). We may suggest, based on our evidence, that during the second half of the thirteenth century Thebes either initiated or carried on with the manufacture of ceramics decorated with the then commonly applied patterns, such as the Sgraffito with Concentric Circles. This can be related to its new position as the capital of the Duchy of Athens as opposed to nearby Chalcis, which became the centre of a lesser feudal lordship. The production of these wares in Thebes continued at least until the early fourteenth century. We can further suppose that a potential discontinuance, suggested by the evidence at hand, could be connected with the arrival of the Catalan mercenary troops in 1311, which might have temporarily affected ceramic manufacture. In any case, Thebes' workshops are again attested in the following centuries during Ottoman rule (Vroom 2006, 187).

## CONCLUSION

The main Middle Byzantine Production (MBP) currently appears as a single, but multiform and long-lasting ceramic production including several types (Fine Sgraffito, Painted Sgraffito, Incised

Sgraffito or Aegean, Champlévé, Slip-Painted, Green and Brown Painted Ware).<sup>18</sup> Although these types are significant on chronological grounds, they share a common origin. MBP had a wide diffusion in the twelfth and thirteenth centuries in the Mediterranean and beyond (from Marseille to the Levantine coast, from the Crimea to Cyprus), and its economic importance is supported by its predominance in the few identified Medieval shipwrecks containing significant quantities of glazed pottery.

Evidence of pottery production, in the form of kiln furniture and pottery wasters, found in documented stratigraphic contexts in Thebes and Chalcis gave us the opportunity to test the hypothesis of Central Greece being a potential manufacturing place for MBP. Chemical analysis of reference samples for local production in Thebes and Chalcis, and of examples of MBP from the same and other sites, showed that Chalcis should be considered as the place of origin of the MBP. It probably functioned alongside other regional workshops (for example, Corinth), whose range of production and distribution, however, remains a goal for future research (for Corinthian production see especially White 2009). Chalcis served at the time as the harbour of wealthy Thebes, and occupied a strategic location on the maritime trade routes. Its role is further enhanced by our results. The latter also provide new chemical reference groups *stricto sensu*, which may be used in the future to investigate the role of these important cities in previous periods as well.

Furthermore, the study gives information about the evolution of pottery production in Thebes and Chalcis. The political fragmentation of the thirteenth century gradually changed the conditions that facilitated the predominance of MBP and led to the establishment of a number of regional workshops whose ceramics were mainly destined to cover local markets. While continuing earlier techniques, they introduced new types, prominent among which was the 'Sgraffito with Concentric Circles' (previously related to 'Zeuxippus Ware'). Thebes was one of these workshops functioning in or by the mid-thirteenth century and continuing at least to the early fourteenth century and beyond. Chalcis eventually followed the same course, its production probably carrying on well into the Ottoman period.

The data presented in this paper leave several questions for future research. The precise location of the MBP and later workshop(s) still has to be identified. As far as MBP is concerned, although kiln furniture from both inside and outside Medieval Chalcis was examined, none was found associated with wasters of MBP. The origin of the clay material itself is to be looked for in the nearby Lelantine plain, where a long tradition of clay quarrying persists to the present day. But the workshops are still awaiting discovery, and questions regarding their location in relation to the city's topography and the size of their installations are opened. Further work could also help in tracing the trade routes followed by the MBP, and its associations with other products along these routes. The abundance of MBP in western and southern Anatolian sites such as Anaiia and Myra (Findik 2010) suggests that part of it could have been directed to the Levantine area.

The same questions also stand concerning the later ceramic production, both in Thebes and Chalcis. Establishing the chemical identity of both workshops leads the way to identifying the extent of their respective market potential as influenced by their respective historical conditions. In any case the effort to develop a more direct and truthful picture of the complex production and distribution patterns in the Middle and Late Byzantine Aegean, as affected by the diverse political and economic conditions, still remains a primary goal for future investigations.

Another point which would deserve further study concerns the evolution of food and foodways between the Byzantine and the Frankish periods, as these may be approached through pottery studies (Vroom 2003, 329–31; Williams 2003, 431–3; Joyner 2007). The production of MBP clearly continues after the end of the Byzantine rule in Chalcis, possibly for as long as a century, with the same forms and sizes and presumably the same uses. What does it imply in terms of dining habits? Was it still used by the same populations? Was it adopted by the newcomers? Or

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<sup>18</sup> To these should be added Monochrome Plain Glazed Ware, a usually much less regarded component of the MBP which was not considered in the present study, but which should definitely be taken into account in any quantitative approach.

did it become mainly a commodity for export, as suggested by the emergence of new pottery productions in both Thebes and Chalcis, and the continuation of MBP in distant contexts (*e.g.* Kinet) rather than in closer regions where it was initially widespread (*e.g.* Corinth)? Some of these questions may hopefully be addressed by future research.<sup>19</sup>

In any case, the present endeavour could be envisaged as an initial effort to reconstitute the ceramic production of Medieval Greece, so that complex political, financial and social aspects may be appreciated and evaluated within the wider historical conditions that affected Byzantium.

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<sup>19</sup> Concerning the latter point, a project called POMEDOR focusing on food and foodways in the Medieval Eastern Mediterranean was recently initiated (<<http://www.pomedor.mom.fr>> accessed 16 October 2014).



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**Η «Κύρια Μεσοβυζαντινή Παραγωγή» και η σχέση της με τα εργαστήρια κεραμικής στη Θήβα και τη Χαλκίδα**  
 Στη μελέτη αυτή παρουσιάζονται τα αποτελέσματα της αρχαιομετρικής και αρχαιολογικής έρευνας, που αφορούν στη σχέση μεταξύ γνωστών τύπων βυζαντινής 'επιτραπέζιας' κεραμικής με τα εργαστήρια παραγωγής στην Θήβα και την Χαλκίδα κατά την περίοδο από τον 12<sup>ο</sup> μέχρι τον 14<sup>ο</sup> αιώνα μ.Χ.

Θεωρείται πλέον δεδομένο ότι πολλοί τύποι κεραμικής του 12<sup>ου</sup>–13<sup>ου</sup> αιώνα, όπως η «γραπτή με πράσινο και καφέ χρώμα», η «λεπτεγάρακτη» και η γνωστή ως «Aegean Ware», αποτελούν μέρος μίας, ενιαίας και μακροχρόνιας παραγωγής βυζαντινών κεραμικών – που εδώ αποκαλούμε «Κύρια Μεσοβυζαντινή Παραγωγή» ('Middle Byzantine Production', MBP) –, η οποία γνώρισε ιδιαίτερη διάδοση σε ολόκληρη την Μεσόγειο, και ιδιαίτερα στο ανατολικό τμήμα της.

Ο εντοπισμός τριποδίσκων όπτησης και απορριμμάτων εργαστηρίων κεραμικής σε σωστικές ανασκαφές της Θήβας και της Χαλκίδας έδωσε τη δυνατότητα να προσδιοριστεί η 'χημική ταυτότητα' των κεραμικών των δύο πόλεων, αλλά και να διερευνηθεί κατά πόσον η Κύρια Μεσοβυζαντινή Παραγωγή θα μπορούσε να προέρχεται από την περιοχή της κεντρικής Ελλάδας. Τα αποτελέσματα της έρευνας υποδεικνύουν την Χαλκίδα – πόλη που κατείχε στρατηγική θέση στους θαλάσσιους εμπορικούς δρόμους και λειτουργούσε ως επίγειο της Θήβας (πρωτεύουσας του Θέματος Ελλάδας) – ως τόπο κατασκευής της κεραμικής αυτής. Η Χαλκίδα, που πλέον αναδεικνύεται σε βασικό κέντρο παραγωγής και διακίνησης, εξετάζεται μέσα στο γενικότερο ιστορικό πλαίσιο της εποχής. Το γεγονός ότι η συγκεκριμένη κεραμική συνεχίζεται και μετά την φραγκική κατάκτηση, χωρίς να παρουσιάζει εμφανείς μορφολογικές αλλαγές, θέτει ερωτήματα σχετικά με τις επιπτώσεις αυτής της κατάκτησης τόσο στα εμπορικά δίκτυα, όσο και στις διατροφικές συνήθειες.

Ο πολιτικός κατακερματισμός του 13<sup>ου</sup> αιώνα σταδιακά μετέβαλε τις συνθήκες εκείνες που είχαν συμβάλει στην επικράτηση της Κύριας Μεσοβυζαντινής Παραγωγής, οδηγώντας στη δημιουργία μιας σειράς από περιφερειακά εργαστήρια κεραμικής, τα οποία στόχευαν πλέον στην κάλυψη των τοπικών κυρίως αναγκών. Συνεχίζοντας τις

παραδοσιακές τεχνικές στην κατασκευή και τη διακόσμηση, εισήγαγαν νέους τύπους κεραμικής, με κυριότερο αυτόν της «κεραμικής με εγχάρακτους ομόκεντρους κύκλους» (που παλαιότερα είχε συνδεθεί με την κεραμική του Ζευξίππου). Η Θήβα ήταν ένα από τα νέα αυτά εργαστήρια. Εμφανίστηκε, πιθανόν, στα μέσα του 13<sup>ου</sup> αιώνα, ενώ συνέχισε να λειτουργεί τουλάχιστον μέχρι τις αρχές του 14<sup>ου</sup> αιώνα. Η Χαλκίδα ακολούθησε και αυτή τις νέες πρακτικές, ενώ η παραγωγή της φαίνεται ότι συνεχίστηκε αδιάλειπτα μέχρι και την Τουρκοκρατία.