



Universiteit
Leiden
The Netherlands

A physicochemical study of Medieval and Post-Medieval ceramics from the Aegean

Panagopoulou, A.

Citation

Panagopoulou, A. (2023, May 9). *A physicochemical study of Medieval and Post-Medieval ceramics from the Aegean*. Retrieved from <https://hdl.handle.net/1887/3620224>

Version: Publisher's Version

License: [Licence agreement concerning inclusion of doctoral thesis in the Institutional Repository of the University of Leiden](#)

Downloaded from: <https://hdl.handle.net/1887/3620224>

Note: To cite this publication please use the final published version (if applicable).

ABSTRACT

The archaeological excavations carried out in Greece at Chalcis, Athens and Mytilene have resulted in the accumulation of a large collection of Medieval and Post-Medieval glazed pottery vessels and sherds that is unparalleled in the Aegean region and that is a perfect basis for archaeometrical research. This thesis' objective is to analyse 245 ceramic samples from these three excavated sites in Greece with the most advanced technological methods. These archaeological sites distinguish from others in the (eastern) Mediterranean where glazed pottery manufacture has been confirmed. The glazed pottery assemblages in these cities clearly demonstrate a changing industry as they date from the Early Byzantine to the Early Modern periods.

In particular, the studied pottery samples from a rescue excavation in Chalcis date from Early Byzantine (ca. 7th-9th c.) to Early Modern times (ca. 19th-mid 20th c.); however, most ceramic samples can be dated to the Middle Byzantine period (ca. 10th-late 12th/early 13th c.). The studied pottery samples from the Ancient Athenian Agora date from the Middle Byzantine (ca. 10th-late 12th/early 13th c.) to the Ottoman/Venetian periods (ca. late 15th-18th c.) with the largest amount being produced in Late Byzantine/Early Ottoman times (ca. 13th-15th/16th c.). Finally, the studied pottery samples from excavations at the Castle of Mytilene (located on Lesbos island) date from the Late Byzantine/Frankish (ca. 13th-mid 15th c.) to the Early Modern periods (ca. 19th-mid 20th c.) but the largest amount of glazed pottery fragments dates to Ottoman/Venetian times (ca. late 15th-18th c.).

This thesis attempts to investigate the provenance as well as the glazed pottery techniques and their development through time with the help of finds from the three aforementioned archaeological sites which produced glazed pottery themselves. This was achieved through multiple sampling of 245 glazed pottery sherds from these three production centres while applying an integrated analytical methodology that took into account compositional data of ceramic body, slip, glaze and pigments. The chosen ceramic samples were examined using a number of archaeometrical techniques such as Optical Microscopy (OM), X-Ray Fluorescence Spectroscopy (pXRF, WDXRF), Petrographic analysis, X-Ray Diffraction Spectroscopy (XRD), Scanning Electron Microscopy (SEM-EDS) and Raman Spectroscopy. In order to identify the source of the clayey materials used for ceramic productions as well as the pottery technology in these three archaeological sites and outline their compositional variability, an integrated approach was used, in which geology (mineralogy, petrography), chemistry, archaeology and ethnography were involved. Ethnography allowed me, for instance, to gain an improved understanding of the culture, social dynamics and cultural differences of the potters from the three studied areas. As such, this helped to reconstruct the cultural milieu and the level of technological knowledge. Upon presenting the research results, ethnographic data was combined with archaeometrical data in order to reveal various aspects of the previous pottery production in the three centres, to highlight resemblances and differences and their potential link to social and artistic patterns, as well as to enrich knowledge about the provenance of raw materials in the three studied sites.

This dissertation aims at investigating the impact of potters on pottery innovation, and specifically on the production, distribution and diffusion of technology in the Aegean due to sociopolitical,

cultural and economic developments in the Mediterranean. A period of transition and experimentation in glazed pottery technologies was identified, while certain technological practices were shown to be more sophisticated than has previously been acknowledged for the periods under study on the three sites. The examination of the diversity of the studied pottery samples was pivotal because this illustrated ceramic links between the eastern and western parts of the Aegean as well as ceramic links with other pottery workshops in the West (such as Maiolica from Italy) and in the East (such as Iznik and Kütahya from western Turkey). Hence, the idea to connect all these data into a referencing archaeometrical framework of Medieval and Post-Medieval glazed pottery was an innovative point for archaeological research in the Aegean.

A sophisticated fabric technology construction with high vitrification stages was carried out by the potters in Chalcis. These potters focused their interest on specific types of pottery, for which they used a strict protocol of raw materials, firing temperature and kiln conditions. Furthermore, they seemed to have standard recipes for each colour and they did not make experiments with new colour recipes. In general, these potters tried to improve and keep permanent the fabric technology construction as well as the incised depictions in slip rather than the use of a variable colour palette. The potters in Athens, on the other hand, used very fine-grained clayey raw materials but a different fabric construction technology regarding temperature and kiln conditions. Having a long pottery tradition for many centuries, they mainly followed the same know-how in firing with unstable kiln conditions sometimes, although they gave their utmost importance to the raw materials and their processing. Concerning the colour palette, they tried to enrich it with different hues as they tried to imitate some pottery types from other regions (such as Maiolica from Italy) and tried to create at the same time their own style in the so-called locally produced Polychrome Painted Ware/Maiolica. A large variety in fabric technology construction (such as temperature, kiln conditions, and size of inclusions) was, on the contrary, observed in Mytilene. It seemed that these potters made here many experiments in order to change or improve their production on the island.

The physicochemical analysis of the fabrics of the studied ceramic sample proved that the local production at Chalcis was carried out, as in antiquity, from clay from the area of the Lelantine Plain, which is located southeast of Chalcis. Furthermore, it was proved that two different sources of raw materials were used for the locally made pottery in the Athenian Agora samples; firstly, red fine clay that can be found on Mt. Pentelikon and Mt. Parnitha, and secondly, pinkish clay that can be found near the Municipality of Vari-Voula-Vouliagmeni at the Saronic Gulf in Attica. Concerning Mytilene, the raw materials seemed to have come from an area near the castle in the city such as the southeast coastal area (specifically from Mytilene to the airport) or from another area known as 'Moria'.

All the glazes of the local pottery and of the imported ceramics at Chalcis and the Athenian Agora were typically lead glazes with a small amount of alkali. The analysed glazes of the local pottery from Mytilene were mainly lead glazes, and sometimes these had a small amount of alkali. A clear variation was noticed in the glaze recipes of the imported pottery fragments at Mytilene: lead glaze with high K, lead with high Na, and alkali glazes with different proportions. Furthermore, these potters were experienced in both glossy and matte glazes for the desired result. They used Zinc oxide, ZnO, for increasing the brightness and for a matte finish; Tin dioxide, SnO₂, for opacity; and Titanium dioxide, TiO₂ for whiteness and opacity. Apart from sophisticated construction, the pottery decoration of the studied pottery samples is versatile. In fact, decoration with geometric

designs or free style lines, plants or vegetal motifs, animals and inscriptions or monograms was very popular. The pottery from Chalcis presents a higher variety of motifs compared to Mytilene and Athens. On the other hand, a higher diversity of recipe pigments was observed in the Mytilene ceramic sample collection.

The studied pottery samples show that Chalcis had artistic influences from present-day Turkey, Italy and the East, whereas the ceramic samples from the Athenian Agora seemed to have rather artistic influences from Italy and Spain. Moreover, clear influences on pottery were observed between the Chalcis and Athens workshops. Mytilene had high artistic influences from Western Turkey and less from Italy possibly due to the geographical location of Lesbos Island. Although traditional pottery was developed many centuries ago in Greece, the Medieval and Post-Medieval potters tried to create a new artistic identity in order to compete with well-established workshops in Italy, Spain and Turkey. Let us not forget that pottery and glassmaking was an art based on trial, error and experimentation. Finally, the pottery under study appears to show a melting pot of Byzantine Orthodox, Western European, Eastern Christian and Islamic influences in the decorative patterns.

The information of the studied pottery samples from Chalcis, the Athenian Agora and Mytilene was combined with historical sources, which testify to the flourishing of these cities in Medieval and Post-Medieval times and making them to very important commercial and productive centers in the Mediterranean. In general, many imported ceramics from various regions of the Mediterranean and the Near East were found, thus interpreting the commercial connection of the workshops at Chalcis, Athens and Mytilene with these regions and underlining the importance of their ports as trading hubs of the Mediterranean in Medieval and Post-Medieval times. The presence of ceramics from Italy, Spain, China, and especially from the Islamic East, is not a direct indication of the existence of systematic trade with all these areas, but it reflects the importance of these ports and their participation in a wide network of commercial and cultural contacts during the period under study.

The methodology in this thesis has been carefully chosen, and the archaeometrical techniques (ranging from optical microscopy, X-ray fluorescence spectroscopy, petrographic analysis, X-ray diffraction spectroscopy, scanning electron microscopy (SEM-EDS) and Raman spectroscopy) and the resulting scientific analyses on 245 ceramic samples from three archaeological sites (Chalcis, Athena, Mytilene) were interpreted in a careful way. The arguments based on these are appropriate and coherent. The aim was to contribute scientific analyses to the general picture of Medieval and Post-Medieval material culture (and in particular pottery production) in the Aegean region. Hence, this dissertation shows evidence of originality, and certainly adds to the state-of-the-art of our knowledge on the studied pottery technologies and innovations mentioned above.