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Late medieval pottery production in South Western Crimea: laboratory investigations of ceramics from Cembalo (region of Sebastopol / Chersonesos)

Sylvie Yona Waksman, N. Ginkut

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NO MEDITERRÂNEO**
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CERÂMICA E COMÉRCIO
CERAMICS AND TRADING

LATE MEDIEVAL POTTERY PRODUCTION IN SOUTH WESTERN CRIMEA: LABORATORY INVESTIGATIONS OF CERAMICS FROM CEMBALO (REGION OF SEBASTOPOL / CHERSONESOS)*

Abstract: Evidence of pottery manufacture in the late medieval period in the Genoese fortress of Cembalo (Balaklava, Crimea) gave the opportunity to define a new chemical reference group and to reconsider pottery production in South Western Crimea, in the region of Chersonesos.

Résumé: Les vestiges d'ateliers de potiers datés de la fin de la période médiévale mis au jour par les fouilles de la forteresse génoise de Cembalo (Balaklava, Crimée) ont donné la possibilité de définir un nouveau groupe de référence chimique et de reconsidérer les productions de céramiques du Sud Ouest de la Crimée, dans la région de Chersonèse.

Recent excavations carried out by the National Preserve of Tauric Chersonesos in the Genoese fortress of Cembalo (Balaklava, district of Sebastopol, Crimea) provided evidence of glazed pottery production dated back to the second half of the 14th - 15th centuries (Ginkut, 2012). These finds give the opportunity to reconsider the question of pottery production in the region of Chersonesos in the late medieval period, as part of more extensive research on local and imported pottery in the Crimea in the framework of a French-Ukrainian “Dnipro” program¹.

Chemical analyses carried out at the “Laboratoire de Céramologie” in Lyon were used to investigate ceramics productions. The definition of a new chemical reference group, based on the analysis of kiln furniture and unfinished wares from Cembalo, would give a new perspective on previous data on Crimean material, and especially on ceramics found in Chersonesos (Waksman and François, 2004-2005; Waksman and Romantchuk, 2007). For the latter, we could not rely on reference material *stricto sensu*, but used specific categories of amphorae (Sazanov *et al.*, 1995; Sazanov, 1997: type 56), tiles and common wares assumed to be local as potential local references.

SAMPLING

Reference samples for Cembalo consisted of tripod stilts (BZY166-168) and biscuit fired wares (BZY159-165, Fig.1 top left). The sampling also included a range of finished products (BZY169-187), several of which were found together with their unfinished counterpart (Fig.1 middle left and bottom right). Samples presented various techniques of decoration: plain glazed wares (BZY178-179, Fig.1 top right), monochrome and polychrome sgraffito wares (BZY169-177, 180, 184-187, Fig.1), slip painted wares (BZY181-184, Fig.1 bottom right) sometimes associated with notches (BZY181-182). Two examples presenting the same monogram (BZY186-187, Fig.1 middle right) were included in the sampling as well (BZY186: Mytz 2005, p.303 fig.7).

Samples previously analyzed from Chersonesos are presented elsewhere (BYZ295-300, 310-330, 334, 357, 361-366, 368: Waksman and Romantchuk 2007). They included table wares with styles and techniques of decoration fairly similar to Cembalo's examples, together with fragments of amphorae, tiles, common wares and a fishing net weight (BYZ357, 361-366, 368) taken as potential representatives of the local production. The latter point was justified by the close chemical features of these different functional categories (Waksman and Romantchuk, 2007). Furthermore, the particularly fine texture of the amphorae and common wares fabric made them suitable as comparative material for table wares. This feature was true to a lesser extent for the tiles and fishing net weight, and is not the general case, as different raw material are commonly used at a given production site to manufacture different categories of wares.

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). Twenty-four elements are quantified, seventeen 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_2O_3 , SiO_2 , K_2O , CaO , TiO_2 , MnO , Fe_2O_3) and nine trace elements (V, Cr, Ni, Zn, Rb, Sr, Zr, Ba, Ce).

Classification of samples was obtained by hierarchical clustering analysis applied to standardized 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.2). The two samples the most alike in elemental composition are connected by a horizontal link, which

* With the collaboration

¹ This project is directed by I. Teslenko (Academy of Science of Ukraine) and S.Y. Waksman (CNRS). The support of the French Ministry of National Education, the French Ministry of Higher Education and Research and the State Agency for the Problems of Science, Innovation, and Informatization of Ukraine is gratefully acknowledged.

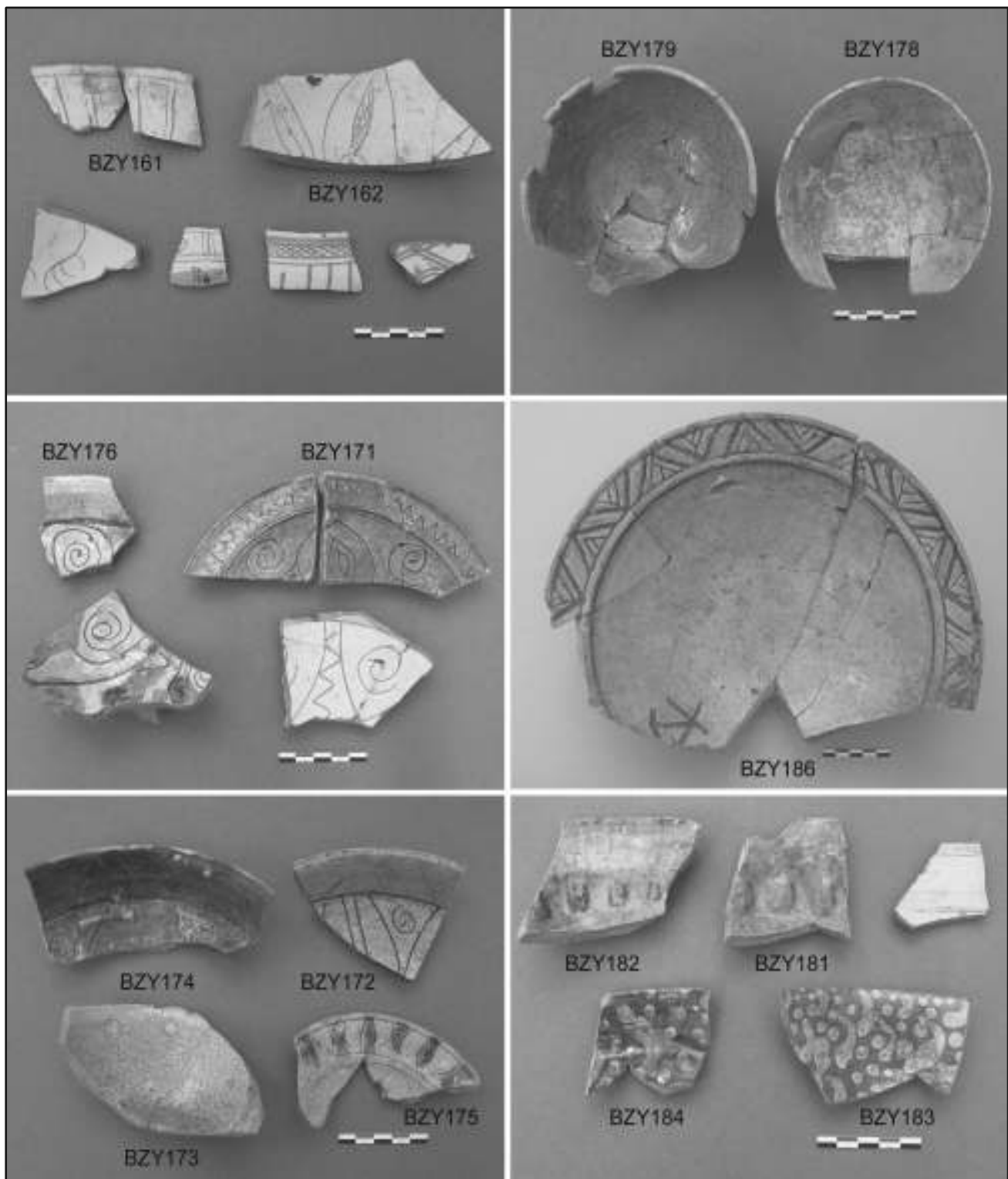


Fig.1 Examples of ceramics analyzed from Cembalo, some shown with their unfinished counterpart: top left, middle left (bottom right), bottom right (top right).

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 does not take into account 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).

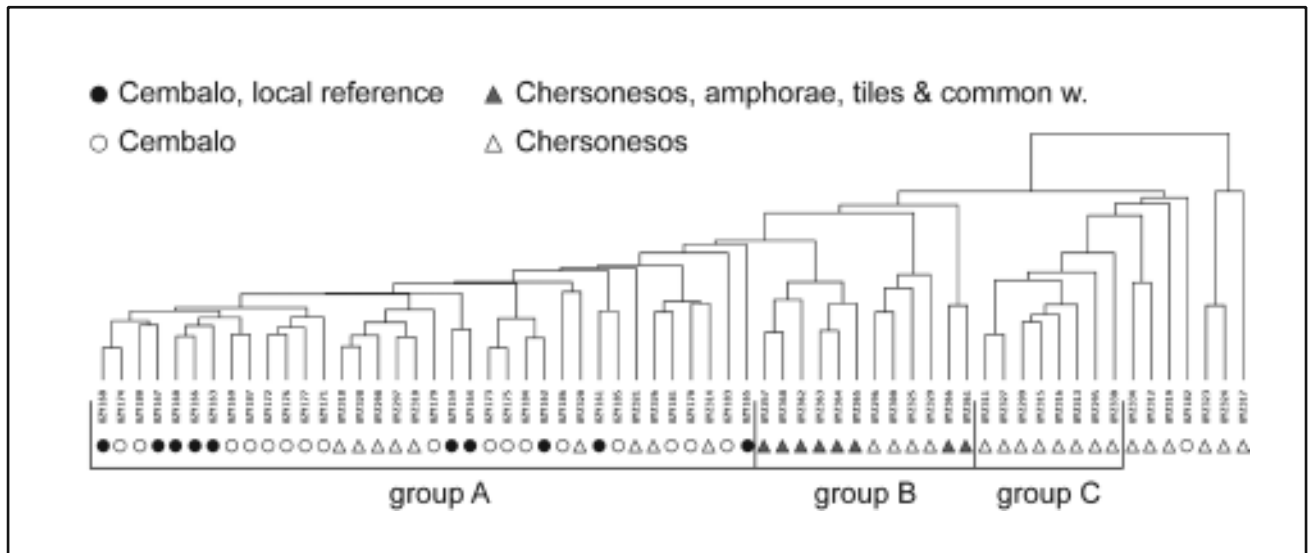


Fig.2 Classification according to chemical compositions of ceramics found in Cembalo and Chersonesos. Symbols indicate sites, point out local references, or indicate amphorae, tiles and common wares in the case of Chersonesos. The main chemical group (A) and sub-groups (B, C) are underlined.

RESULTS

The classification (Fig.2) does not show well differentiated groups. It consists of a main group, two smaller structures and a number of marginal samples which appear on the right hand side of the figure. The main group (group A) gathers some samples from Chersonesos and all those from Cembalo except one, including the local references (indicated by black dots in figure 2). The structure indicated as “group B” is distinguished from group A by its lower contents of manganese and strontium (Fig.3). These elements are usually not considered discriminant, especially as they may be affected by pollutions (e.g. Picon, 1987)². However, the fact that this group gathers all the amphorae, common wares, etc. likely to represent Chersonesos products (indicated by grey triangles in figure 2), together with some of the glazed wares, may be significant. Another possible structure (group C) is characterized by lower manganese and higher magnesium contents, compared to group A (Fig.3). It includes samples found in Chersonesos, but ongoing research suggests that it shares chemical features with wares from other sites as well, related to “Caffa style”. The binary plot magnesium - manganese (Fig.4) shows some features distinguishing the three structures, together with samples marginals to each of them.

All three groups may correspond to pottery manufactured with clays taken from the same geological formations, whose chemical composition would slightly differ from one location to another. In the case of Cembalo and Chersonesos, related to groups A and B respectively, it is very likely the case given the close proximity of the two sites. Furthermore,

archaeological evidence for pottery production in the region of Chersonesos in the late medieval period was found in the outskirts of the city, closer to Cembalo, rather than in the city itself. Ceramics from Chersonesos previously considered local (Waksman and Romantchuk, 2007) should rather be attributed to “the region of Chersonesos”, including Cembalo.

Similar geological formations occur in a large part of the Crimea, where they reach the southern coast in the regions of Sebastopol / Chersonesos and of Feodosia / Caffa³. Whether group C could correspond to the products of Caffa would request further research. In any case, these features call for caution in the attribution of ceramic manufactured in sites located within or close to these geological contexts.

CONCLUDING REMARKS

Laboratory investigations of late medieval ceramics, including wasters, excavated in the Genoese fortress of Cembalo (Crimea) made it possible to propose a new chemical reference for the region. The clay material used in Cembalo may however not be very different from the one used in other workshops, located in the same area of Sebastopol / Chersonesos in South Western Crimea, or in other areas sharing similar geological features such as the region of Caffa. Our results also gave the opportunity to reconsider previous attribution to late medieval Chersonesos, and to propose instead an attribution to the “region of Chersonesos”, including Cembalo. They are consistent with archaeological evidence, pointing out the development of more rural workshops in the area at that time.

² but the ratio Ca/Sr may be significant (Waksman 1995, Schneider and Japp 2009).

³ Detailed geological information on the Crimea was however not available to us. We would like to thank Dr. Grytsenko (Department of geology, Kiev National Taras Shevchenko University) for giving us the opportunity to take pictures of a geological map of the Crimea (scale 1/200.000, 1984).

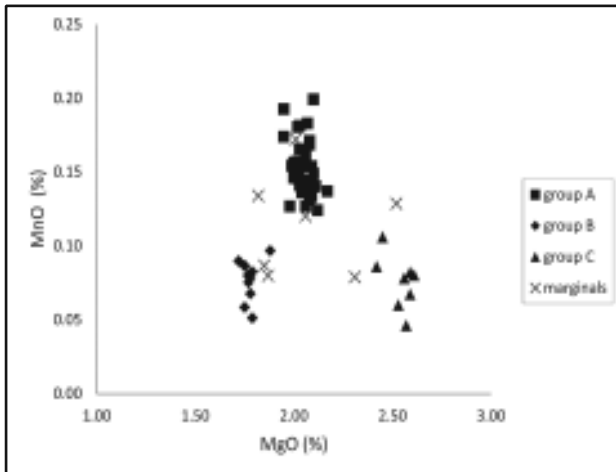


Fig.4 Binary plot magnesium - manganese, showing how the sub-structures groups B and C may be differentiated from each other and from group A. Samples marginal to one or another structure are also shown.

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