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Contents

Preliminary analysis of the bronze age pottery from Dudeștii Vechi-*Cociohatul Mic*[1*]

Sofia Bertea

Abstract: In the study of prehistoric artefacts, correspondence analysis (CA) is used to separate chronological phases or spatial distribution. Corroborated with ^{14}C data, this method can validate or invalidate the classical periodization systems contributing to a better understanding of the evolution of certain communities. This methodology was applied to several archaeological features from Dudeștii Vechi-*Cociohatul Mic*, a site that belongs to the Early Bronze Age Mureș Culture. Unfortunately, the settlement from Dudeștii Vechi-*Cociohatul Mic* does not yet benefit from any radiocarbon dating that would allow for a chronological check of the CA results, but this type of approach can help one to determine its position in the internal chronology of the Mureș Culture and see if there are traces of multiple phases in the settlement.

Keywords: Early and Middle Bronze Age; Mureș Culture; correspondence analysis; chronology; ceramics; Lower Mureș Basin.

Introduction

The Mureș Culture (also known as the Periam-Pecica Culture) was intensely researched and discussed ever since the end of the 19th century on the territory of present-day Romania[2], Hungary[3], and Serbia[4]. A series of systematic researches have been performed in sites such as Periam, Pecica, Beba Veche, Deszk A and F, Mokrin, Sándorfalva, Pitváros, Szöreg, Battonya, Klárafalva, Kiszombor and others, so that the chronological inclusion of the Mureș Culture to the Bronze Age and the inner chronology of the culture have triggered some debates over time. From the researched sites, the few published data on the topic provide a relatively unclear picture of the general framework of the Early and Middle Bronze Age periods in the plain area of the Lower Mureș.

The present study aims at analyzing the pottery material from a series of features that belong to the Mureș Culture on the site of Dudeștii Vechi – *Cociohatul Mic*. The pottery fragments were analyzed from a statistical perspective and with the methods of correspondence analysis in order to observe the possible presence of indications of habitation structured according to several stages that can be defined form the perspective of the pottery style.

Brief overview of the chronological identification and inner periodization of the Mureș Culture

Several archaeologists have discussed over time the topic of how to include the Mureș Culture in the chronology of the Bronze Age. I shall briefly present their opinions below.

P. Roman believes that the beginning of the culture in question should be placed during the end of BT III[5], while M. Gumă places the beginning of the Mureș Culture (sub-phase Ia) during stage Ib

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* English translation: Ana M. Gruia.

1 The present article is an adapted version of my MA thesis defended in 2019 part of the MA program „Arheologie în contextual dezvoltării durabile" (Archaeology in the context of sustainable development) of the West University in Timișoara. I hereby wish to thank Mr. Călin Timoc for kindly allowing me to use the pottery material and the required documentation and Mr. Dragoș Diaconescu for mentoring me in this journey.

2 Pădureanu 1973, 395–397; Soroceanu 1975, 161–179; Soroceanu 1977, 55–79; Soroceanu 1984, 43–78; Șandor-Chicideanu, Chicideanu 1989, 5–38; Soroceanu 1991.

3 Banner 1931, 49–53; Patay 1938, 52–59; Foltiny 1941, 69–98; Bóna 1965, 17–28; Gazdapusztay *et al.* 1968, 35–38.

4 Girić *et al.* 1970, vol I, II; Porčić 2010, 165–182; Matić 2012, 169–185.

5 Roman 1986, 32.

of the Early Bronze (that corresponds to stages Roman BT II/Gogâltan BT IIb[6]) and believes it is characterized by the discoveries from the necropolis in Ószentiván, the first stage of the necropolis in Mokrin, and the early graves in Battonya, Deszk A, and Szöreg[7]. The second phase of the Mureș Culture (II) is placed during the first stage (A) of the middle phase of the Bronze Age, while the end of the culture is deemed contemporary to level I in Pecica-Șanțul Mare[8]. From the perspective of absolute dating, M. Gumă places the Early Bronze between 2000 and 1800/1700 BC, though he does not exclude the possibility that this period started earlier[9]. F. Gogâltan believes that the introduction of the Mureș Culture in Banat as a distinct manifestation took place during sub-phase IIb of the Early Bronze, basing his conclusion on some of the metal artifacts that could belong to this period and that were discovered in the necropolis from Beba Veche, while placing sub-phase Mureș Ib to stage BT III, during the 2300–1950 cal BC[10] interval. The author in question attributes the end of the Mureș Culture, of the Cornești-Crvenka Group, and at the same time of the *tells* in Câmpia Banatului to stage BM III that he dates between 1650 and 1500 cal BC[11].

As for the inner periodization of this culture, T. Soroceanu has taken up the task in an extensive manner during several of his works[12]. He has divided this culture in two phases, thus: phase I (sub-phase Ia) includes levels I-IV in Periam and Mokrin I, sub-phase Ib includes levels V-XI in Periam, levels VIII-V in Pecica and Mokrin II and phase II includes levels III-I in Pecica, the late graves in Szöreg, and the necropolis of Deszk A[13].

Brief overview of the geographic context

The municipality of Dudeștii Vechi is located in the western extremity of Timiș County, 9.6 km east of the border with Serbia, on the bank of River Aranca. Before the Habsburg initiative of drying and regulating the rivers during the 18th century, the entire area was crossed by river meanders, now dried up.

The archaeological site in Dudeștii Vechi – *Cociohatul Mic* is located approximately 9 km W of the municipality of Dudeștii Vechi, 600 m E of the Romanian-Serbian border and approximately 4 km away from the present-day course of the Aranca, namely in the Aranca-Mureș interfluve.

The approximately 1.5 m difference between the altitude of the site and the surrounding areas is the main reason why this sand bank was favorable to habitation ever since the Early Neolithic. Analyzing the Austrian topographic surveys, one notes that the first two are not very helpful in the identification of clear characteristics for the investigated area, but on the third survey (1869–1887) (fig. 31) one notes in the area of the site a marked sand bank that is bordered both westwards and eastwards by a currently dried branch of River Aranca and to the north by a marshy area.

Brief history of research regarding the Bronze Age in the area of the municipality of Dudeștii Vechi as well as on the archaeological site in *Cociohatul Mic*

Archeologists have shown an interest in the area of the settlement of Dudeștii Vechi ever since the end of the 19th century. Amateur archaeologist Gyula Kisléghi Nagy performed the first researches in 1893–1913[14]. He was forced to end the investigations after the start of the First World War and researchers forgot about the area for over seven decades.

In 1996 Constantin Kalcsov, aided by Mircov Francisc, has identified in the area of the municipality a number of archaeological sites among which the spot called *Cociohat* where he discovered pottery fragments dated to the Neolithic, the Bronze Age, the Post-Roman Period, and the Middle Ages[15]

[6] Gumă 1997, 24.
[7] Gumă 1997, 24–25.
[8] Gumă 1997, 51–54.
[9] Gumă 1997, 38–39.
[10] Gogâltan 2015, 54–61.
[11] Gogâltan 2015 54, fig. 1.
[12] Soroceanu 1984 43–78; Soroceanu 1991.
[13] Soroceanu 1991, 124–125.
[14] Kisléghi Nagy 2015, 213.
[15] Kalcsov 1999, 153–159.

that he presented to the public in 2006 when the monograph of Dudeștii Vechi was published[16]. In 2015 Petru Ciocani and Andrea Jozsa published an article identifying anew all the archaeological sites dated to Prehistory found in the territory of the municipality, with GPS coordinates this time, and revealing the intensive ground levelling works of the Emiliana West Rom company on the spot called *Cociohatul Mic*[17]. In 2016 Octavian Rogozea performed non-invasive researches on the site[18] and specialists of the National Museum of Banat performed preventive researches on the spot of *Cociohatul Mic*, during two campaigns, in the summer and autumn of that same year[19].

Other archaeological sites that contain materials belonging to the Bronze Age on the territory of the municipality of Dudeștii Vechi have been identified on the following spots[20]:

1. Movila lui Dragomir: Eneolithic, Bronze Age, Antiquity, the Middle Ages[21];
2. Zabrana: Bronze Age, the Middle Ages[22];
3. Spot 12: Neolithic, Bronze Age, Antiquity, the Middle Ages[23];
4. Spot 15: Neolithic, Eneolithic, Bronze Age, Antiquity, the Middle Ages[24];
5. Hunca Mare (barrow): grave (possibly Yamnaya, G. K. Nagy attributes it to the Neolithic), La Tène pottery fragments, early medieval grave (archaeologically researched by G. K. Nagy)[25];
6. DV 32/Ferma Emiliana West Rom: Early Bronze Age, the 2nd–4th centuries[26];
7. DV 37: Early Bronze Age, the 2nd–4th centuries[27];
8. DV 42: Neolithic, Early Bronze Age, the 2nd–4th centuries[28];
9. DV43: Early Bronze Age, the Middle Ages[29].

Methodology

A total of 268 archaeological features were identified during the campaign performed in the summer of 2016 in Dudeștii Vechi – *Cociohatul Mic*. Among them, 155 certainly belong to the Bronze Age (preliminary identification based on the pottery inventory), and during the researches 40 of them were interpreted as postholes, 2 as alveoli, 1 as a water well, 3 as possible dwellings, and 3 as inhumation graves. The other 106 were interpreted as storage/household pits or deposition pits[30]. The other 31 features either belong to the Neolithic or did not contain pottery material that could help specialists decide if they belonged to one period or another.

Out of the 155 features that belong to the Bronze Age, specialists have left out those with functions connected to the category of postholes (40 features), water wells, alveoli, and funerary features. The remaining 109 features were described as household/storage pits, pits with depositions, or possible dwellings.

Based on the data available in the research report and due to the interval available for the present research, I have selected 14 of these stratigraphic units. Wishing to identify a possible chronological development of the Bronze Age site, my main selection criterion was the stratigraphic relation between the envisaged features. Thus, I have selected the following features: cx. 11A and 11B (intersected), cx. 16, cx. 30, and cx. 31 (intersected), cx. 52 and cx. 53 (intersecting), cx. 54 and cx. 55 (intersecting), cx. 57, cx. 59, cx. 60, cx. 70, and cx. 87. In the case of four of these features (cx. 11A, cx. 11B, cx. 54, cx. 55), the material could not be identified in the boxes brought up from storage and/or the paper notes had been destroyed, so that I was unable to decide which bags belonged to which feature. In the case of

16 Ronkov *et al*. 2006, 39–40.
17 Ciocani, Jozsa 2015, 23–37.
18 Rogozea, Rogozea 2016, 143–158.
19 Timoc *et al*. 2017.
20 The numerical indicatives of the sites bellow correspond to those on fig. 30.
21 Ciocani, Jozsa 2015, 22.
22 Ciocani, Jozsa 2015, 22.
23 Ciocani, Jozsa 2015, 23.
24 Ciocani, Jozsa 2015, 23.
25 Ciocani, Jozsa 2015, 16–17, 27–28.
26 Rogozea 2016, 154.
27 Rogozea 2015, 155.
28 Rogozea 2016, 156.
29 Rogozea 2016, 157.
30 Attribution from the feature files filled in by the authors of the preventive archaeological research report.

the fifth feature I only found 7 atypical fragments (cx. 59), so that I have excluded it. Thus, I ended up analyzing 9 features (cx. 16, cx. 30, cx. 31, cx. 52, cx. 53, cx. 57, cx. 60, cx. 70, and cx. 87).

I have statistically analyzed the pottery materials from two perspectives. The first consists of the evaluation from the point of view of the technological aspects, envisaging the pottery from the perspective of color, surface treatment, temper material, firing, the diameter of their bases and rims, and the thickness of the walls. In each feature the pottery was initially divided into the three categories – fine, semi-fine, and coarse. In order to bring subjectivity to a minimum while attempting to divide the pottery among these three categories, I turned to the criterion set by C. Ionescu and L. Ghergari[31].

As for the color, I have selected 10 shades from the list suggested by Gh. Lazarovici and D. Micle, namely: black, light gray, dark gray, red, orange, yellow, light brown, dark brown, brick-red, and grayish-black[32].

In the case of surface treatment, I have selected the following variants: not burnished, burnished, polished and barbotine[33]. As for the temper material, I have selected eight variants: fine sand, large-grain sand, grit, sand and grit, crushed shards, chaff, shards and sand, sand and shards[34].

In the case of firing, I have selected five variants: good oxidation firing, poor oxidation firing, good reduction firing, poor reduction firing, and secondary firing[35]. The pottery fragments were also measured, recording the diameter of the rim and base and the thickness of the walls.

The analysis of the pottery fragments has also focused on the morphological characteristics of the pottery, i.e. the shape of the pots, the types of rims, bases, handles/knobs and decoration. For the typology of the shapes I started from the classification published by T. Soroceanu[36] and added subtypes and variants for each pot type encountered during the present study (fig. 10 shows the shapes identified during this research). For the typology of the ornaments I also initially started from T. Soroceanu's classification[37] but I soon noticed it was incomplete and the code system was cumbersome for correspondence analysis. As a result, I have devised a typology based on the decoration techniques encountered in the researched lot, with a different system of codes (fig. 36–39). Existing specialized publications do not include a typology for the rims (fig. 32), bases (fig. 33), and handles (fig. 34), so that I started new categories based on the material under research.

For the correspondence analysis (CA), the selected features dated to the Bronze Age had to match a series of criteria, the first of which is that they had to be closed features. The second condition envisages the stratigraphic relation between some of them, as I have mainly selected features in direct connection in order to research the existence of a possible chronological development. Unfortunately, the ground-leveling interventions performed by Emiliana West Rom (subsequently the beneficiary of the above-mentioned preventive research) have affected the upper part of the features and, inevitably, have led to the partial loss of the material in their fill.

Pottery is the most common and, at the same time, the most dynamic element in prehistoric settlements. Thus, the variables connected to its morphological aspects are the ones most often employed in the creation of databases aimed at supporting results with chronological value[38]. In the present approach as well, during the correspondence analysis, I have employed morphological aspects, while the type of analysis is the frequency/abundance type. Unfortunately, the absence of radiocarbon analyses performed from the site analyzed in the present work makes it more difficult to observe and clearly stress a chronological tendency inside features dated to the Bronze Age on this site.

From the perspective of decoration, it was difficult to distinguish between motifs performed with the potters' brush (tree bark/*besenstrich/rusticated*) and those made with the pottery comb (*kammstrich*[39]*/combed*), as no clear definition of the two types of decoration is available. Thus, starting

[31] Ionescu, Ghergari 2006, 452.
[32] Lazarovici, Micle 2001, 211.
[33] Lazarovici, Micle 2001, 211.
[34] Lazarovici, Micle 2001, 210.
[35] Lazarovici, Micle 2001, 212.
[36] Soroceanu 1991, 24.
[37] Soroceanu 1991, 25.
[38] Schier 2000, 187–194; Jensen, Nielsen 1997, 29–61; Nielsen 1997, 71–99; Muller 1996, 217–222; Muller 2009, 721–736.
[39] Gogâltan 2004, 132.

from the examples and explanations provided by A. Nicodemus and J. O'Shea[40], I have performed the following differentiation: in the case of *besenstrich*-type decorations, the deepened lines are uneven in thickness and the distance between them is also uneven lengthwise, while in the case of combed decoration the thickness of the deepened lines is even throughout, as well as the distance between the lines. In this way, even if pottery fragments with combed decoration might look like a *besenstrich*-type motif due to fragmentation and the outlook of the pottery fabric, these decoration techniques can be identified with a minimum degree of subjectivity based on this criterion. One must note the following in relation to this topic: the discussion of the decorative or practical function of the *besenstrich*-type ornaments and the reason why it was used on pots is not appropriate here, as deciding upon the role and reasons behind its use does not influence the results of the correspondence analysis. Choosing to include it in the category of ornaments not in the surface treatment category is strictly aimed at attributing a type of code that allows its use as variable in the correspondence analysis.

The created database was interpreted from the perspective of correspondence analysis, using version 5.43 of the Winbasp software. As previously mentioned, I have approached the material from the perspective of correspondence analysis in order to identify a possible chronological development inside the site on the basis of this sample, in case if such a development exists, using frequency analysis. Thus, the database created for the present research includes analysis units translated, in this case, through the features that contained the analyzed pottery fragments. And so, the variables are all the morphological characteristics observed on the analyzed pottery fragments.

Description of the analyzed features[41]

Cx. 16: pit with household refuse, with a slightly oval mouth, measuring 138 cm in length, 130 m in width, and 110 cm in final depth measured from the level of identification. The feature had been cut by a channel subsequently labeled S2. The fill of the feature was homogenous, with sandy granulation, dark brown in color. The inventory of the pit included pottery fragments belonging to the Mureș Culture, a bit of adobe, animal bones, and pieces of coal from which a sample was taken for the ^{14}C analysis (that was eventually not sent for analysis).

Cx. 30: pit with household refuse, with circular ground plan (150 cm in diameter), measuring 40 cm in maximum final depth, measured from the level of mechanical soil removal. The fill was homogenous, with clayish granularity, blackish in color. The inventory of the feature is restricted in size, containing few pottery fragments, unprocessed animal bones, and entire, unprocessed seashells. It was cut by cx. 31.

Cx. 31: pit with household refuse, with circular ground plan – its diameter measured 160 cm and the final maximum depth from the level of identification measured 50 cm. The fill was homogenous, sandy in granularity, blackish-brown in color. The inventory of the feature is richer than the inventory of the feature it cuts and consists of pottery fragments, adobe fragments, unprocessed animal bones and antlers, and unprocessed seashells.

Cx. 52: pit with household refuse, circular in ground plan, with a diameter of 193 cm and the maximum depth from the level of identification measuring 60 cm. Its fill was homogenous, with clayish granularity, blackish in color. The inventory of the feature is relatively small, consisting of pottery fragments, unprocessed animal bones, both burnt and unburnt, and unprocessed seashell fragments. It was cut by cx. 53.

Cx. 53: pit with household refuse, with circular ground plan, measuring 140 cm in diameter, and with the final maximum depth from the level of identification measuring 49 cm. The fill of this feature was homogenous, with clayish granularity, blackish-brown in color. Its inventory is the richest, consisting of pottery fragments and unprocessed animal bones.

Cx. 57: pit with household refuse, with circular ground plan, measuring 230 cm in diameter. Its fill was homogenous and consisted of clayish, dark brown soil. The inventory of this feature consisted of pottery fragments, one almost entirely preserved pot, and animal bones.

Cx. 60: pit with household refuse, with circular ground plan, measuring 130 cm in diameter and

[40] Nicodemus, O'Shea 2015, 695–697.

[41] The data in this part of the study have been taken from Timoc *et al.* 2017, 20, 23, 30–35, 39–40.

the final maximum depth measuring 60 cm. Its fill was not homogenous, containing three layers, with ash-like granularity, sandy and lumpy, depending on the layer, blackish-brown in color. The first layer of the fill ends at the depth of 43 cm and is characterized by clay mixed with ash. The second layer is sandy, while the third consists of blackish clay with lumps of yellow clay. Its inventory includes fragmentary pottery, fragmentary adobe, unprocessed animal bones, and unprocessed fragmentary seashells.

Cx. 70: was interpreted as a possible dwelling. It follows a circular ground plan, with the diameter measuring 180 cm and the final maximum depth measuring 160 cm. Its fill is not homogenous, clayish and ash-like in granulation, blackish in color. 40 cm below the mechanical uncovering level the soil was aired, yellowish-brown in color, with pigments of adobe and seashell remains. The subsequent 20 cm consisted of sandy, light brown soil containing with lenses of yellowish clay, devoid of archaeological materials. The next level, also measuring 20 cm in thickness, was clayish, even, with few archaeological materials. Archaeologists have subsequently noted several thin layers of blackish clay with pigments of burnt materials alternating with layers of yellowish or blackish-brown clay, with large animal bones and pottery fragments. The next layer was brown, even, with several lenses of yellow clay in the lower part. The last layer was made of blackish-brown clay, even in texture and color, that contained numerous pottery fragments and entire pots, besides large animal bones.

Cx. 87: storage pit. It followed a circular ground plan, with the diameter measuring 135 cm and the final maximum depth measuring 30 cm. Its fill was homogenous, with clayish granularity, blackish-brown in color. The inventory of the feature consisted of pottery fragments, adobe, and unprocessed animal bones. Two entire miniature vessels were found in this feature.

Statistical results

For the statistical analysis of the pottery material I have analyzed a total of 677 fragments in the 9 features, distributed thus: cx. 16 contained 38 pottery fragments, cx. 30 contained 6 fragments, cx. 31, 148 fragments, cx. 52, 6 fragments, cx. 53, 74 fragments, cx. 60, 31 fragments, cx. 70, 64 fragments, while cx. 87 has revealed 181 pottery fragments (fig. 1).

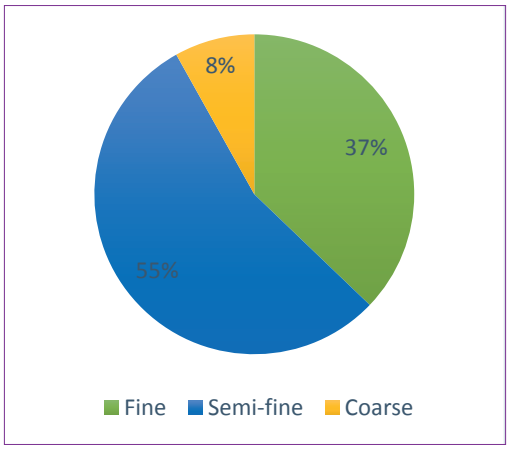

Fig. 1. Distribution of pottery fragments according to feature.

The analysis of the technological characteristics of the pottery material from the 9 analyzed features has focused on the 7 aspects presented above (ceramic category, firing, surface treatment, color, temper material, rim and base diameter, and wall thickness). The results are presented below.

In order to avoid a large number of graphs, I have chosen to present as examples the graphs obtained for features cx. 31, 70, and 87 that I deem representative from the perspective of the number of shreds.

Pottery category

In the case of feature cx. 31, semi-fine pottery represents the highest proportion (55%), followed by coarse pottery 37%, and fine pottery that only amounts to 8% (fig. 2). Approximately the same

proportions have been calculated for feature 87: semi-fine pottery there represents 52%, fine pottery reaches a higher proportion, 17%, while coarse pottery amounts to 31% (fig. 4). In the case of feature 70, on the other hand, semi-fine pottery reaches 82%, while fine and coarse pottery lots were found in equal proportion, i.e. 9% (fig. 3). All of the features follow the same rules.

An interesting observation is that coarse pottery was found in small proportions in all cases, between 3 and 27%. In 6 of the features, coarse pottery represents less than 20%, and in a single case more than 20% (cx. 53).

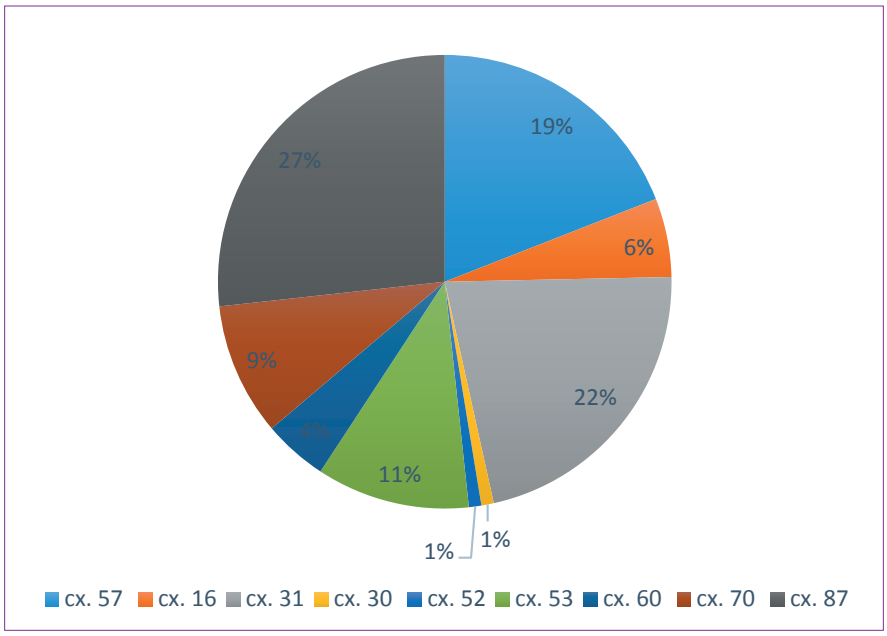

Fig. 2. Pottery categories in cx. 31.

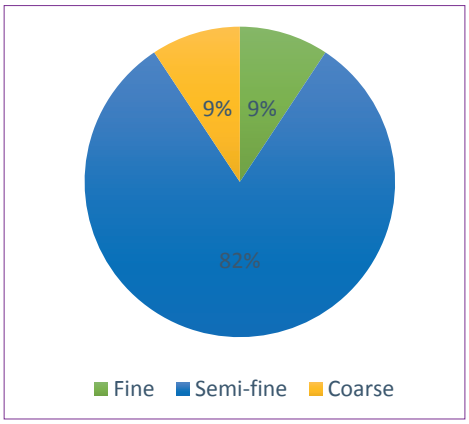

Fig. 3. Pottery categories in cx. 70.

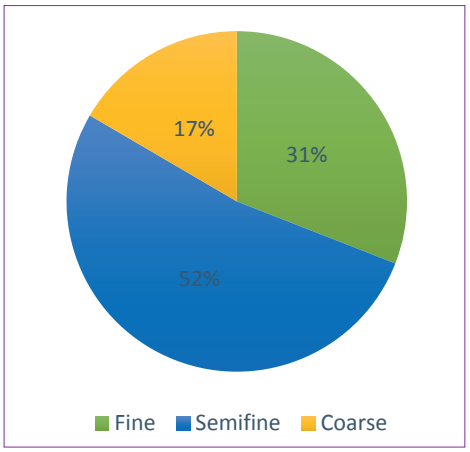

Fig. 4. Pottery categories in cx. 87.

Temper materials

The pottery material found in feature cx. 31 mostly contained fine sand as temper material (43%), but also sand and shards (29%) and large-grain sand (18%) (fig. 5). In the case of feature 70 the situation differs, with the most often employed temper material consisting of sand and shards (44%), followed by fine sand (39%), and large-grain sand (11%) (fig. 6). Feature 87 is generally similar to cx. 70, as the temper material consisting of sand and shards represents 49%, fine sand 28%, and shards and sand 18% (fig. 7).

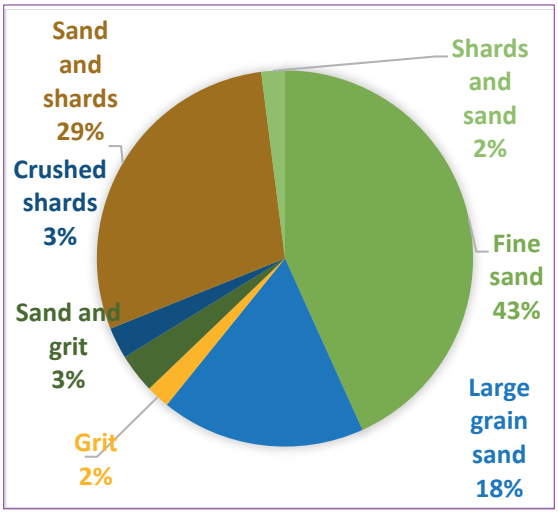

Fig. 5. Temper materials in cx. 31.

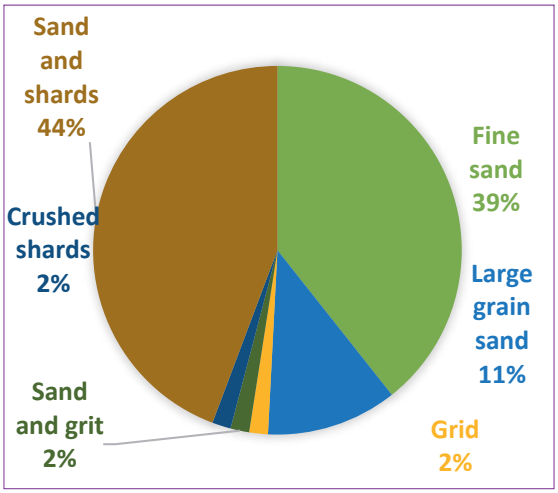

Fig. 6. Temper materials in cx. 70.

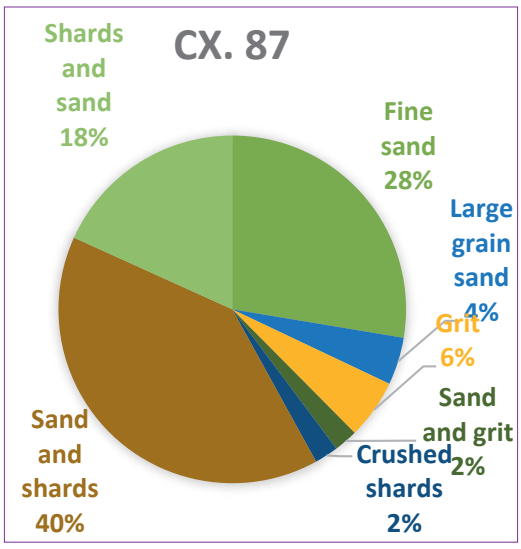

Fig. 7. Temper materials in cx. 87.

Color

The analysis of the inner and outer bisque indicates foremost the type of firing and the quality of the firing of the analyzed fragments, if they do not not display secondary firing as well, as the latter

generally alters the color, consistency, and shape of pottery vessels. But the analysis of the exact shade of individual pottery fragments is not very relevant as the result depends on the person performing the analysis, the type and intensity of light, fatigue etc. I shall thus discuss the proportion between dark and light colors.

In the case of outer color, all analyzed features can be included in the same group, as dark colors are predominant. Cx. 31 mostly contains shards with brown outer shades (43% dark brown and 10% light brown) and black (38%), and light shades represent a very small percentage (4% brick-red and 2% orange) (fig. 8). On the inside, most of the shards are black, (53%), while some are dark brown 25% (fig. 9). Light shades are even rarer, with orange representing just 1%. Feature 70 follows approximately the same proportions of outer shard colors, with dark brown representing 28%, black 23%, though light shades are more numerous, with 14% brick and 2% red (fig. 10). The situation is similar regarding the inner color of the shards, dark shades amounting to 88% of the total number and light shades representing the rest (2% red, 2% orange, 8% brick-red) (fig. 11). Feature 87 contained 47% shards that are dark brown on the outside, 21% black, and at the opposite end of the spectrum, red shards represent 2% and orange 12% (fig. 12). On the inside, dark shades amount to 87%, while red (1%) and orange (12%) represent the light shades (fig. 13). All of the features can be included in the same parameters and this is normal for the period under discussion.

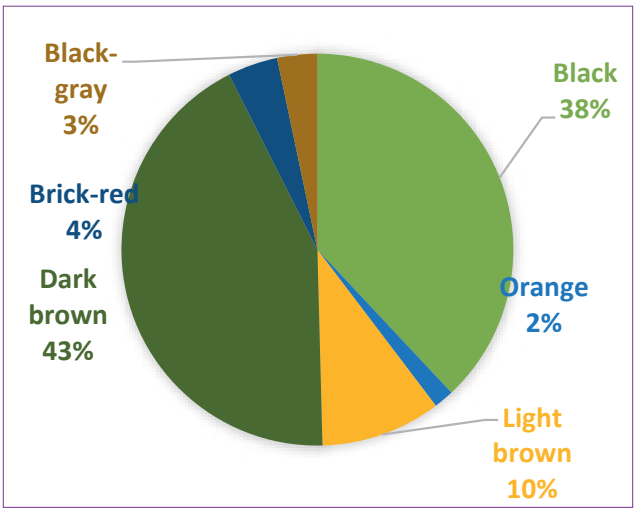

Fig. 8. Outer colors in cx. 31.

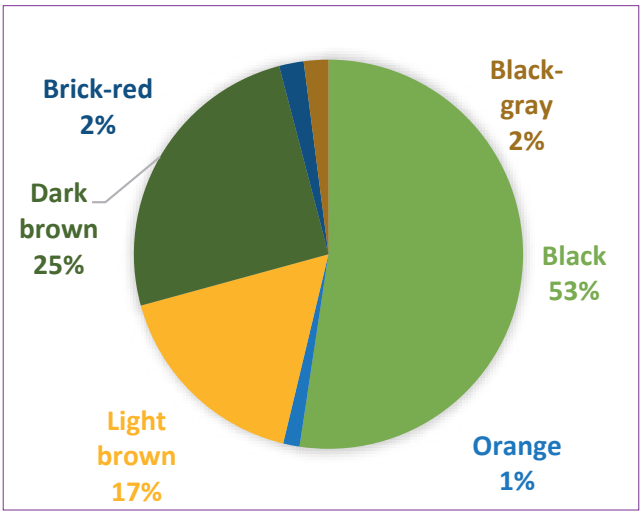

Fig. 9. Inner colors in cx. 31.

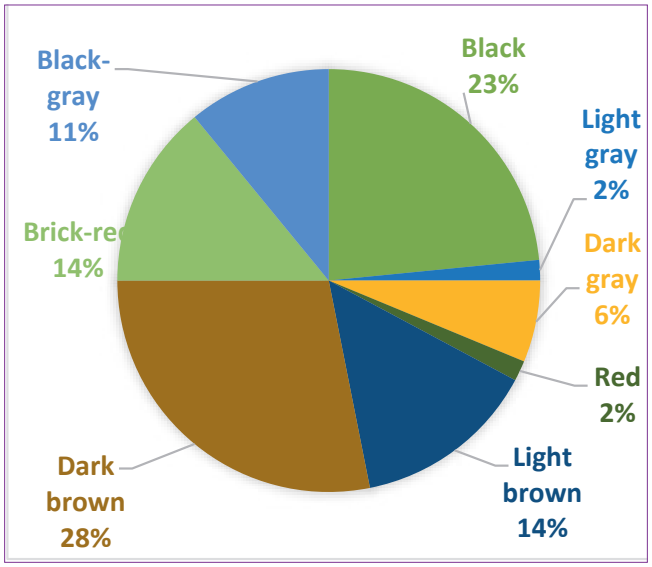

Fig. 10. Outer colors in cx. 70.

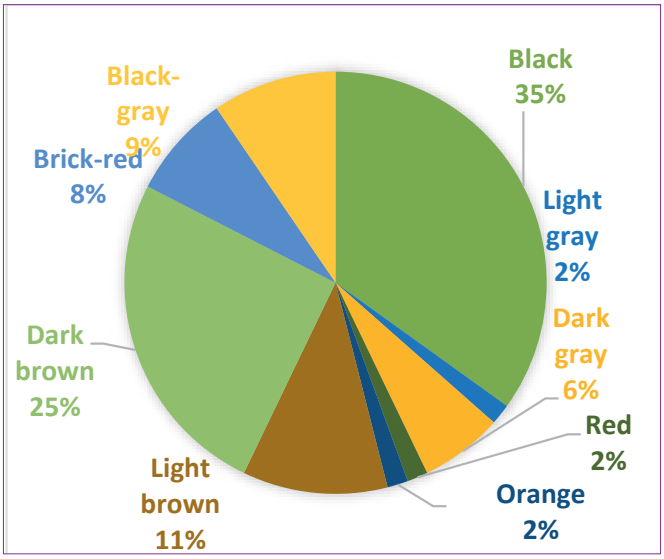

Fig. 11. Inner colors in cx. 70.

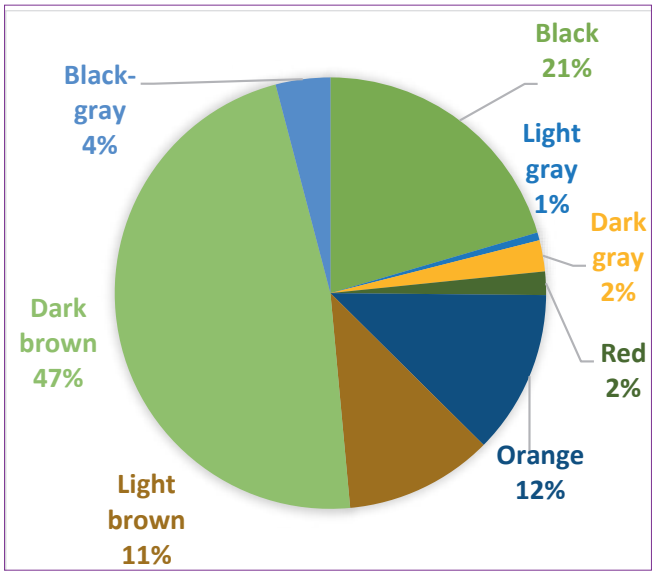

Fig. 12. Outer colors in cx. 87.

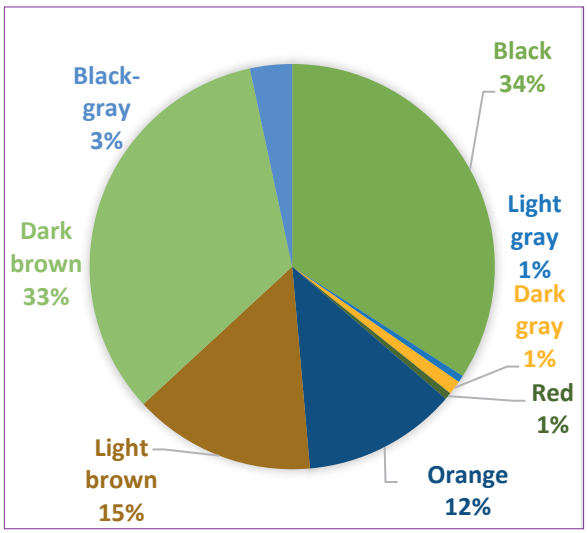

Fig. 13. Inner colors in cx. 87.

Type of firing

The type of firing was established based on the color of the pottery fragments. The degree of firing was established based on the color of the core fabric. If the fabric is different in color (generally black), I interpreted the firing as "poor", while in cases in which the wall displayed the same color on both surfaces and in its core, I interpreted the firing as "good". In all cases, reduction firing was predominant, either poor or good.

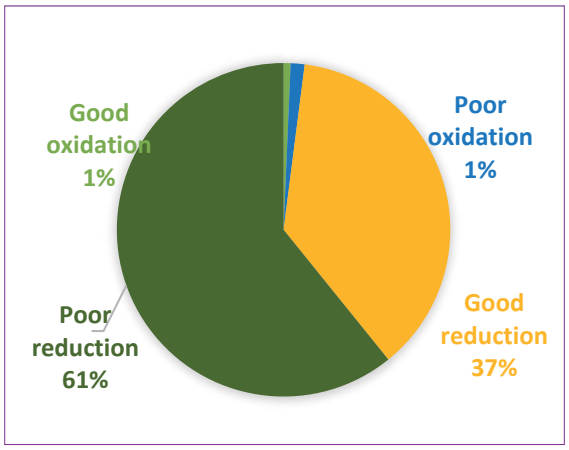

Fig. 14. Types of firing in cx. 31.

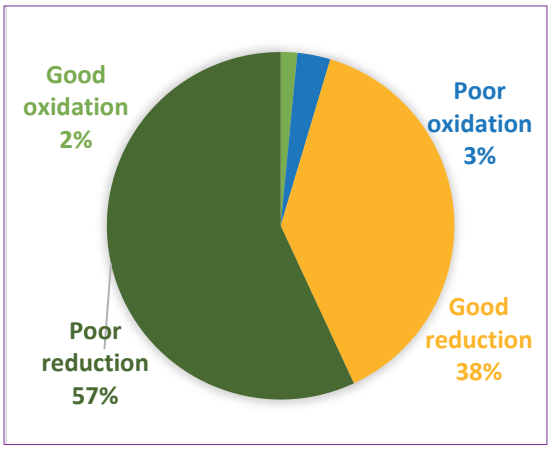

Fig. 15. Types of firing in cx. 70.

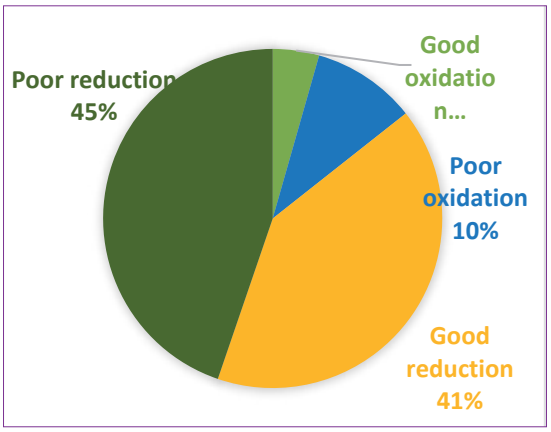

Fig. 16. Types of firing in cx. 87.

Surface treatment

The pottery fragments found in cx. 31 display mostly burnished outer and inner surfaces (42%, namely 71%), 18% with barbotine on the outside (fig. 17–18). In the case of cx. 70, on the outside the proportion of the burnished surfaces is 78%, barbotine represents 6%, and polishing 16%, while on the inside the polished surfaces amount to 27% (fig. 19–20). Feature 87 has the highest percentage of polished outer surfaces, 57%, while on the inside the burnished shards only represent 54% and polished ones 39% (fig. 21–22).

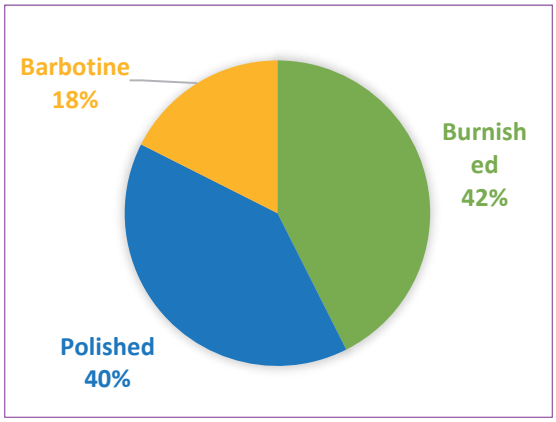

Fig. 17. Outer surface treatment in cx. 31.

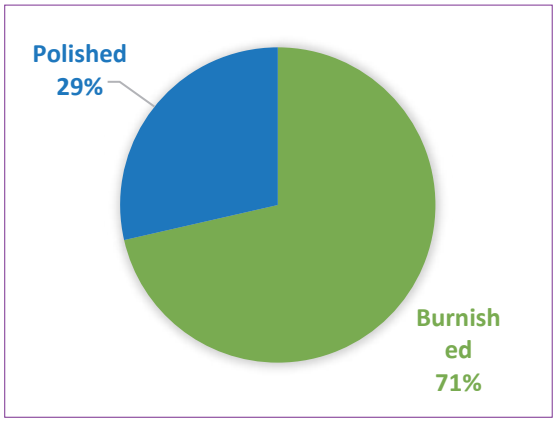

Fig. 18. Inner surface treatment in cx. 31.

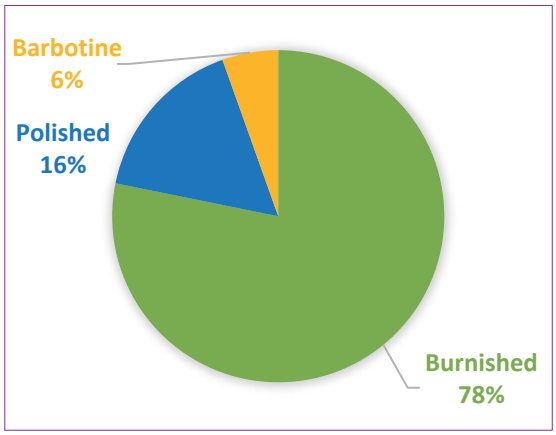

Fig. 19. Outer surface treatment in cx. 70.

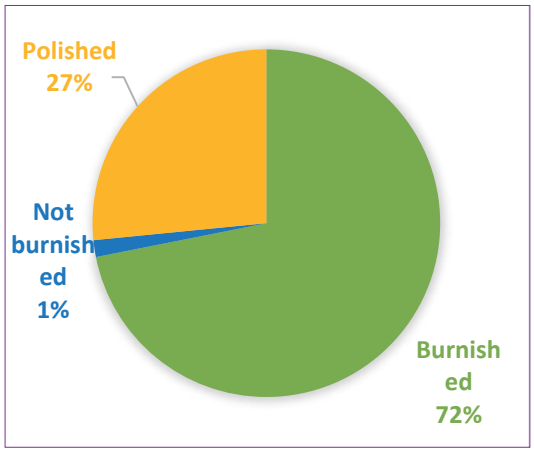

Fig. 20. Inner surface treatment in cx. 70.

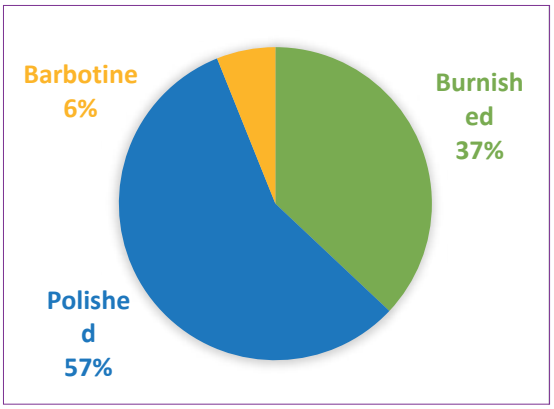

Fig. 21. Outer surface treatment in cx. 87.

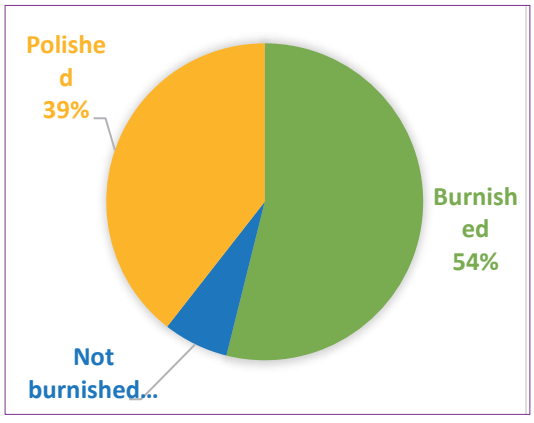

Fig. 22. Inner surface treatment in cx. 87.

CA results

During the correspondence analysis I have employed 47 variables attributed to the 9 envisaged stratigraphic units (fig. 23), automatically eliminating the variables featuring in a single unit/feature. Out of these variables, 12 are rim types, 10 are base types, 4 are handle/knob types, 19 are ornament types, and 2 are pot shapes.

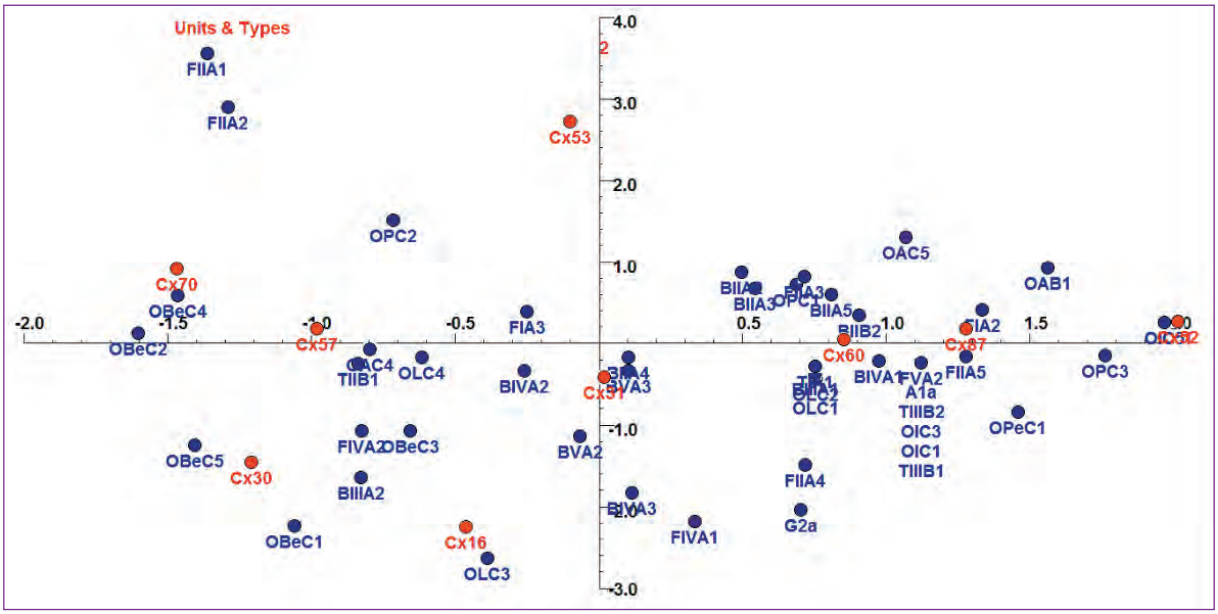

Fig. 23. CA graphic representing all the Units and the Types analised.

On the left side of the graph (fig. 24), in quadrants II and III, one notes the distribution of 5 of the 9 units. Cx. 31 is placed on the Y axis, between quadrants III and IV, while the other 3 units are located on the right side of the graph, in quadrant I. Among the variables consisting of ornament types, one notes that all 5 variants of the *besenstrich*-type decoration are distributed on the left side of the graph, in quadrants II and III (fig. 23).

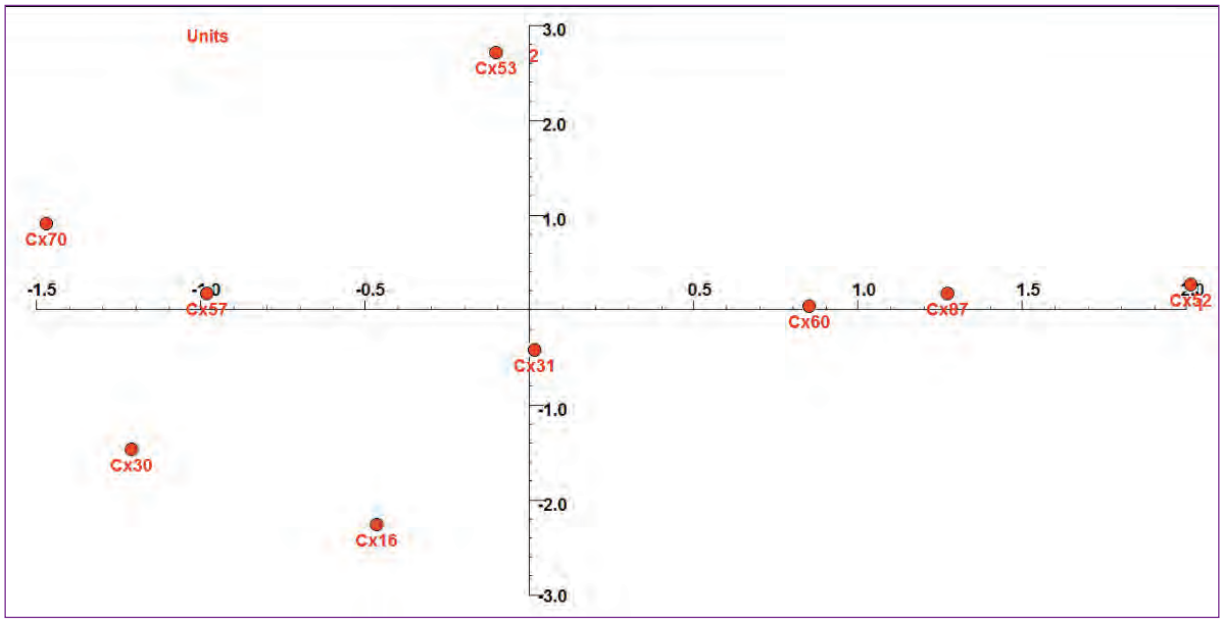

Fig. 24. CA graphic representing the Units analised.

The third graph (fig. 25) marks in different colors the features in direct stratigraphic relation, namely the cut/earlier features (cx. 30, cx. 52) in blue and the cutting/later features (cx. 31, cx. 53)

in green. Based on the graph one notes that no chronological trend is visible through this type of analysis among the features in direct stratigraphic relation. One must stress the fact that cx. 52 and cx. 30 contained very few pottery fragments, and this can induce biases/ subjective tendencies in the analysis proper.

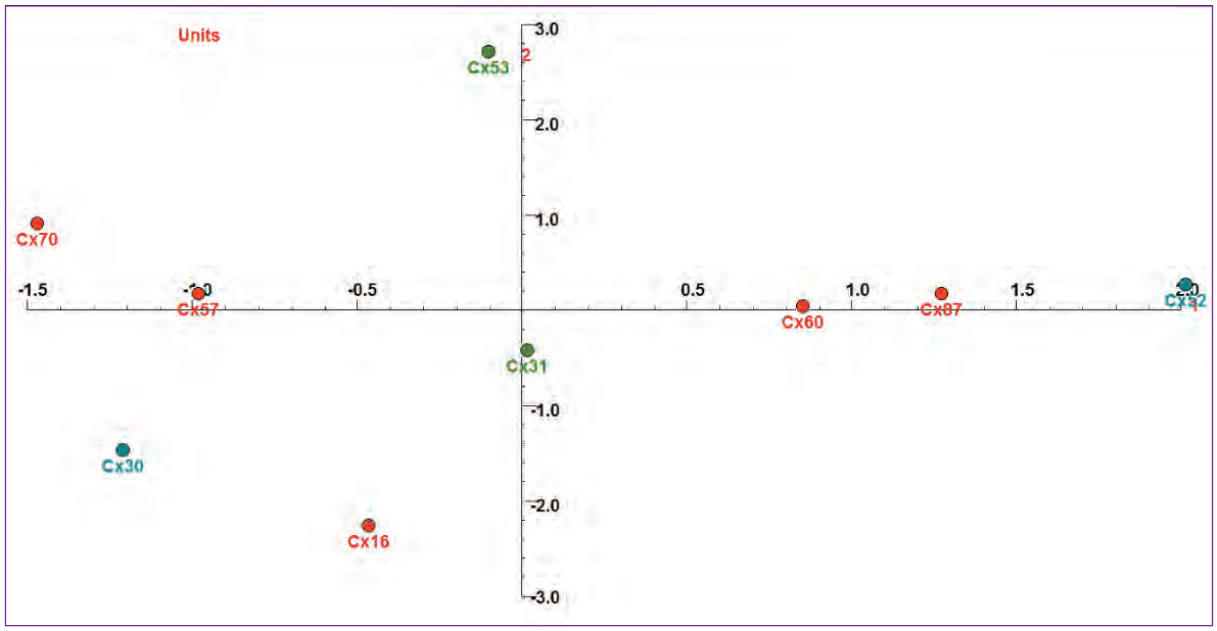

Fig. 25. CA graphic representing the Units with the earlier features marked blue and the later features marked green.

The CA results are doubled by seriation for a better understanding of the distribution of variables inside the analyzed units. The maximum frequency with which a variable is encountered in a feature is 11. Inside this seriation (fig. 26) one can note a chronological trend, the features maintaining the same order as in the above graph despite the existence of certain variables that affect the general picture, featuring in several archaeological features that are not grouped close to each other, such as pot base type FIA2 that features in cx. 57, cx. 87 and cx. 52, stressing a possible longer time span of this morphological element. *Besenstrich*-type decorations are present in the first part of the seriation with higher frequency in the features from the left part of the seriation (cx. 70, cx. 30, cx. 57), frequency decreasing in the features present in the middle (cx. 16, cx. 53, cx. 31, cx. 60, cx. 87) and disappearing entirely in the right side of the graphic depiction (cx. 52).

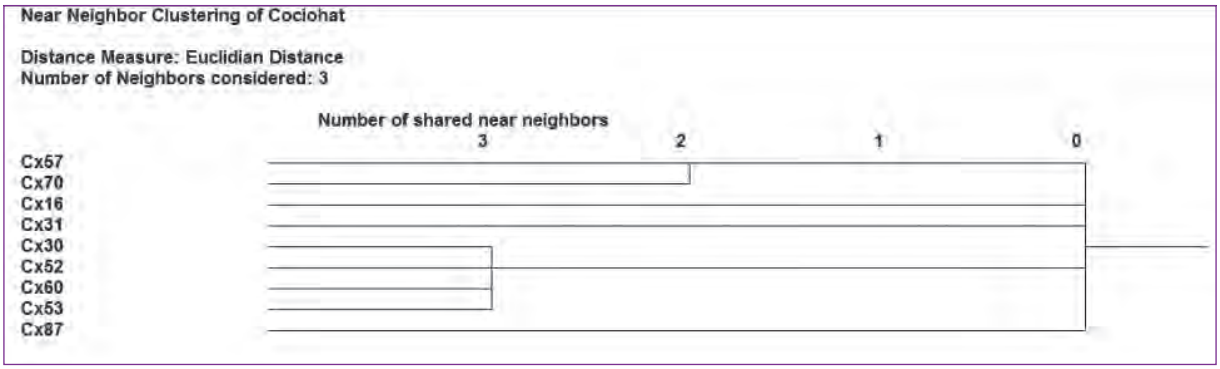

Fig. 27. CA dendrogram.

In the case of the dendrogram (fig. 27), the features in closest relation are cx. 53, cx. 60, cx. 52, and cx. 30. Two other grouped features are cx. 57 and cx. 70, but are set further apart. In the case of features 53 and 52, their close proximity indicates that there is no chronological difference between them that is relevant enough to be reflected by different pottery styles, with the already mentioned caution that cx. 52 contains a small number of pottery fragments.

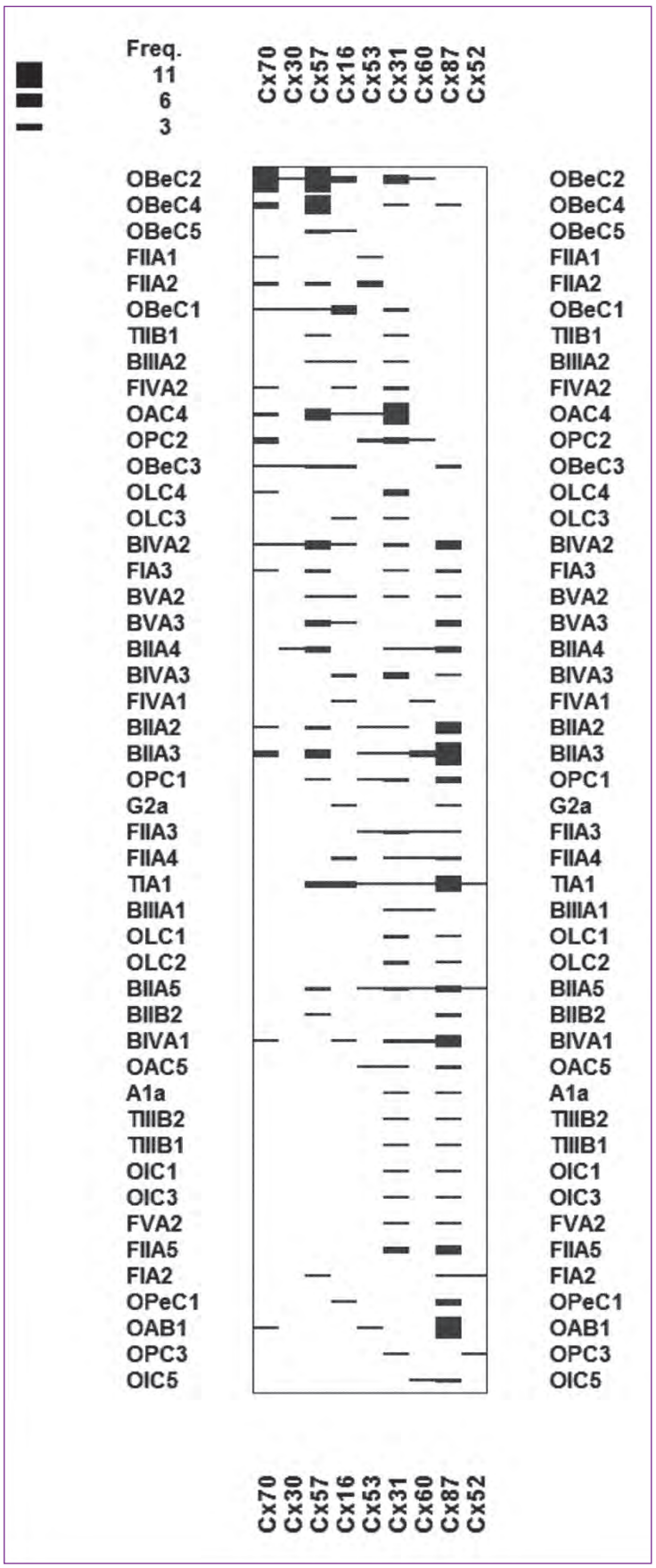

Fig. 26. CA seriation.

Discussions

In the absence of ^{14}C analyses from the site under research in the present study and the publication of the uncalibrated (BP) values of the 77 radiocarbon data performed on the basis of the material from Pecica-Șanțul *Mare*, pottery, namely its decoration, was the main comparison criterion for the chronological identification of the site in Dudeștii Vechi-*Cociohatul Mic*. Thus, based on the analysis of the pottery discovered in Pecica-Șanțul *Mare* published by J. O'Shea and A. Nicodemus, the authors stress the fact that the pottery lots decorated according to the *besenstrich* and *kammstrich* styles are encountered in the start sequences of habitation there[42]. Since *besenstrich*-type decoration has a shorter period of use in the *tell* from Pecica-Șanțul than comb-made decoration, I have chosen to compare the materials based on the position of the first decoration technique. Comparing this decoration technique encountered in the present work and the types of decorations presented in the abovementioned article, I was able to note that among the codes I have attributed, OBeC1 (horizontal *besenstrich*-type decoration, on the body of the pot), namely OBeC2 (oblique *besenstrich*-type decoration, on the body of the pot) correspond to models D, and F, respectively[43], and are the most frequent in the 9 features analyzed in this work. In the seriation presented above (fig. 26) one can note that the first 5 features from left to right, namely cx. 16, cx. 30, cx. 31, cx. 57, and cx. 70, contain both types of ornaments of this decoration technique – OBeC1 and OBeC2 – (except for cx. 60 that contained a single pottery fragment with OBeC2-type decoration). This manner of grouping the features can become a clue for the inner chronology of the settlement in *Cociohatul Mic*[44].

[42] Nicodemus, O'Shea 2015, 695–697.
[43] Nicodemus, O'Shea 2015, 696, fig. 3.
[44] Nicodemus, O'Shea 2015, 694, fig. 2

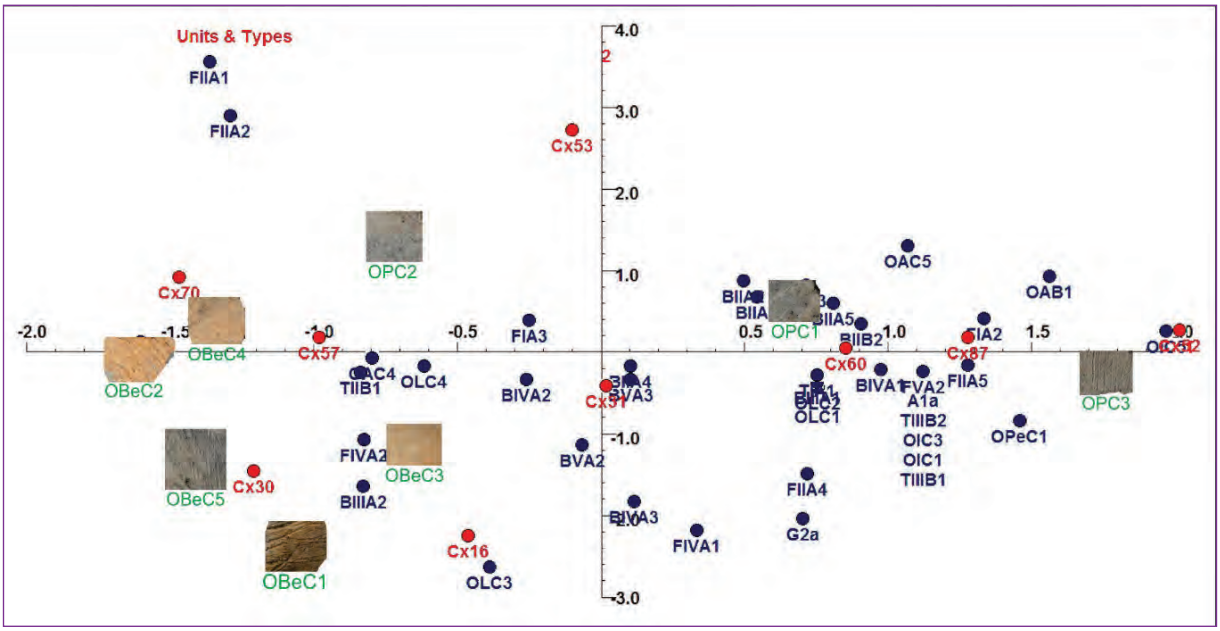

Fig. 28. CA graphic with the representation of *besenstrich* and *kammstrich* type ornaments.

The fact that all the variants of the *besenstrich*-type decoration are grouped in quadrants II and III (on the left side of the graph), while a variant of the *kammstrich*-type decoration features in quadrant II, while the other variants of it are to be found in quadrants I and IV (in the right side of the graph) (fig. 28) and taking into account the somewhat parallel development of these types of decoration presented by A. Nicodemus and J. O'Shea[45] one can also envisage a possible chronological development inside the analyzed features, in the sense that the earlier elements are grouped on the left side of the graph and the slightly later ones on the right side of the graph.

At the same time, the absence of the "Baroque"-type of decoration in these features – interpreted as characteristic to the Middle Bronze pottery – is another argument supporting the dating of this settlement to the Early Bronze[46].

Conclusions

Taking into account the observations above, based on Fl. Gogâltan's chronology of the Mureș Culture[47] and the inner chronology of the *tell* in Pecica-Șanțul *Mare* based on the pottery styles[48], the open-type settlement in Dudeștii Vechi-*Cociohatul Mic* can be included to phase I of the Mureș Culture (most likely to sub-phase Ib) and can be dated approximately between 2200 and 1900 cal BC.

At the same time, the correspondence analysis indicates the possible existence of two chronological stages inside the group of analyzed features. The analysis of all of the viable features from the site in *Cociohat* might change the picture provided by the present study, but the methodology employed here has the potential of helping one reach a better understanding of the inner chronology of this settlement that belongs to the Mureș Cultures, and to a wider degree, of the entire culture defined both through the inner relations between its different sites and through its temporal position inside the Bronze Age.

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presents the *rusticated/besenstrich*-type decoration as present during the earliest stage of the settlement in Pecica, dated to the chronological period of ca. 1950–1900 cal BC.

45 Nicodemus, O'Shea 2015, 694.

46 Nicodemus, O'Shea 2015, 698.

47 Gogâltan 2015, 54, fig. 1.

48 Nicodemus, O'Shea 2015, 694, fig. 2.

Appendix

Description of the illustrated pottery

Plate I

Fragment 1: semi-fine category, light brown on the outside, light brown on the inside, tempered with crushed shards and sand, burnished on the outside, burnished on the inside, relatively good reduction firing, OAC1 type decoration.

Fragment 2: semi-fine category, dark brown on the outside, dark brown on the inside, tempered with sand and crushed shards, burnished both outside and inside, relatively good reduction firing, BVA2 type rim, TIA type handle.

Fragment 3: semi-fine category, light brown on the outside, dark brown on the inside, tempered with sand, polished on the outside, burnished inside, poor reduction firing, FIIA4 type base, OPeC1 decoration.

Fragment 4: fine category, dark brown with black inserts on the outside, dark brown with black inserts on the inside, tempered with fine sand, polished on the outside, burnished on the inside, good reduction firing, BIVA1 type rim, FIVA1 type base, TIA type handle, A3a type pot shape.

Fragment 5: fine category, dark brown on the outside, dark brown on the inside, tempered with crushed shards, polished both on the outside and on the inside, good reduction firing, BVA2 type rim.

Fragment 6: fine category, dark brown with black inserts on the outside, dark brown with black inserts on the inside, tempered with fine sand, polished both on the outside and on the inside, poor reduction firing, FVA1 type base, OIC4 type decoration.

Fragment 7: semi-fine category, orange in color on the outside, orange in color on the inside, tempered with sand, burnished both on the outside and on the inside, god oxidation firing, BIA3 type rim.

Fragment 8: fine category, dark brown with black inserts on the outside, black in color the inside, tempered with fine sand, burnished both on the outside and on the inside, poor reduction firing, OAC3 type decoration.

Fragment 9: fine category, light brown in color on the outside, light brown in color on the inside, polished on the outside, burnished on the inside, poor reduction firing, OIC4 type decoration.

Fragment 10: semi-fine category, dark brown on the outside, dark brown on the inside, tempered with sand and crushed shards, burnished both outside and in, poor reduction firing, TIA type handle.

Fragment 11: fine category, grayish-black in color on the outside, grayish-black in color on the inside, tempered with fine sand, burnished both outside and in, good reduction firing, FVA2-type base, OIC3-type decoration.

Fragment 12: fine category, black on the outside, black on the inside, tempered with fine sand, polished on the outside and on the inside, good reduction firing, OApC1 type decoration.

Fragment 13: fine category, light brown on the outside, dark brown on the inside, tempered with crushed shards, polished both outside and in, poor reduction firing, BIVA1 type rim.

Fragment 14: semi-fine category, dark brown on the outside, dark brown on the inside, tempered with sand and shards, burnished both outside and in, poor reduction firing, OCB1 type decoration.

Plate II

Fragment 1: fine category, black in color on the outside, black in color on the inside, tempered with sand and crushed shards, polished both outside and in, good reduction firing, OApT1 type decoration.

Fragment 2: semi-fine category, brick-red outer color, brick-red inner color, tempered with sand, polished both outside and in, poor oxidation firing, TIA1 type handle.

Fragment 3: semi-fine category, brick-red on the outside, brick-red on the inside, tempered with sand, polished both outside and in, poor oxidation firing, BIIA2 type rim, TIA type handle.

Fragment 4: semi-fine category, dark brown with black inserts on the outside, dark brown with black inserts on the inside, tempered with sand and crushed shards, burnished on the outside and inside, poor reduction firing, BIVA2 type rim, FIIA2 type base, TIA1 type handle, D1a pot shape type.

Fragment 5: semi-fine category, dark brown with black inserts, tempered with crushed shards, burnished outside and in, poor reduction firing.

Fragment 6: fine category, black in color on the outside, black in color on the inside, tempered with fine sand, polished on the outside, burnished on the inside, good reduction firing, BIVA1 type rim, OIC5 type decoration.

Fragment 7: fine category, dark brown with light brown inserts on the outside, dark brown with light brown inserts on the inside, tempered with fine sand, polished on the outside, burnished on the inside, good reduction firing, BIVA1 type rim, TIA1 type handle, FVIA1 type base, A1b type pot shape.

Fragment 8: fine category, black in color on the outside, black in color on the inside, tempered with fine sand, polished on the outside, burnished on the inside, good reduction firing, FIA3 type base.

Fragment 9: semi-fine category, light gray in color on the outside, dark gray in color on the inside, tempered with sand, polished on the outside, burnished on the inside, good reduction firing, OAC3 type decoration.
Fragment 10: semi-fine category, black on the outside, black on the inside, tempered with sand and crushed shards, polished both outside and in, good reduction firing, OLC4 and OApC2 type ornaments.

Plate III
Fragment 1: fine category, *black-topped* outer color, *black-topped* inner color, tempered with sand and small-grain crushed shards, polished on the outside, polished on the upper part and burnished on the lower part on the inside, poor reduction firing, BVA3 type rim, FIIA4 type base, TIA1 type handle, G2a type pot shape.
Fragment 2: fine category, dark gray outer color, dark gray inner color, tempered with sand and small-grain crushed shards, burnished both outside and in, poor reduction firing, BIIIA3 type rim, FIIA5 type base, TIA2 type handle, O1a type pot shape.
Fragment 3: semi-fine category, dark brown outer color, tempered with sand, polished on the outside, burnished on the inside, good reduction firing, BIVA3 type rim.
Fragment 4: fine category, dark brown on the outside with light brown inclusions, dark brown inner color, tempered with fine sand, polished on the outside, burnished on the inside, poor reduction firing, FIVC1 type base, TIA1, TIIIA3 type handle A1a pot shape type.
Fragment 5: fine category, back on the outside with light and dark brown insertions, black on the inside, tempered with fine sand, polished on the outside, burnished on the inside, good reduction firing, BIVA1 type rim, TIA1 type handle.
Fragment 6: fine category, dark gray on the outside with light brown inserts, dark brown on the inside with light brown inserts, tempered with sand and crushed shards, burnished both outside and in, poor reduction firing, BIIA1 type rim, OAB1 type ornament.
Fragment 7: coarse category, brick-red outer color, brick-red inner color, tempered with grit and crushed shards, burnished both outside and in, poor oxidation firing, BIIA2 type rim, TIIIB2 type handle, OAB1 type ornament.
Fragment 8: fine category, dark brown on the outside with black inserts, black inner color, tempered with fine sand, polished on the outside, burnished on the inside, good reduction firing, OIC6 and OIC5 type ornaments.
Fragment 9: fine category, dark brown outer color, dark brown inner color, tempered with fine sand, polished both outside and in, poor reduction firing, OIG1type ornament.
Fragment 10: coarse category, light brown outer color with black inserts, black inner color, tempered with grit and crushed shards, burnished both outside and in, poor reduction firing, OAC6 type ornament.
Fragment 11: semi-fine category, dark brown on the outside with light brown inserts, light brown inner color, tempered with sand and crushed shards, polished in the outside, burnished on the inside, poor reduction firing, OLC6 type ornament.
Fragment 12: semi-fine category, grayish black on the outside with dark brown inserts, grayish black inner color, tempered with sand and crushed shards, polished on the outside, burnished on the inside, good reduction firing, FIVC2 type base.
Fragment 13: fine category, dark brown on the outside with light brown inserts, dark brown on the inside with light brown inserts, tempered with fine sand and small-grain crushed shards, polished on the outside, burnished on the inside, poor reduction firing, BIVA1 type rim, FIVC1 type base, TIA1 type handle, A3b type pot shape.
Fragment 14: fine category, dark brown on the outside with black inserts, dark brown on the inside, tempered with fine sand, polished on the outside, burnished on the inside, good reduction firing, BIVA1 type rim, FIVA3 type base, TIA1 type handle, A1c type pot shape.

Plate IV
Fragment 1: fine category, dark brown on the outside with black inserts, dark brown on the inside with black inserts, tempered with fine sand, polished both outside and in, relatively good reduction firing, BIVA2 type rim.
Fragment 2: fine category, dark brown on the outside, dark brown on the inside, tempered with fine sand and crushed shards, polished both outside and in, relatively good reduction firing, BIIA4 type rim.
Fragment 3: semi-fine category, dark brown on the outside, black on the inside, tempered with sand and crushed shards, polished on the outside, burnished on the inside, poor reduction firing, OAC4 type decoration.
Fragment 4: fine category, black outer color, black inner color, tempered with fine sand, polished both outside and in, good reduction firing, BIIA5 type rim.
Fragment 5: semi-fine category, dark brown outer color, light brown inner color, tempered with sand and crushed shards, burnished both outside and in, poor reduction firing, OAB1 type decoration, BIIA2 type rim.
Fragment 6: semi-fine category, brick-red outer color, grayish-black inner color, tempered with sand and crushed shards, polished above the girdle and burnished below it on the outside, burnished on the inside, poor oxidation firing, OAC4 type decoration.

Fragment 7: semi-fine category, grayish-black outer color, black inner color, tempered with sand and crushed shards, burnished both outside and in, poor reduction firing, OPC1 type ornament.
Fragment 8: semi-fine category, brick-red on the outside, brick-red with light brown inserts on the inside, burnished both outside and in, poor reduction firing, OPC2 type ornament.
Fragment 9: coarse category, dark brown outer color, dark brown inner color, tempered with sand and crushed shards, burnished both outside and in, OPC4 type ornament.

Typological dictionary

Pot types		**Rim types**	
A1a	Amphora-shaped miniature vessel, bitronconic, with flaring rim, narrow neck, two handles starting symmetrically on the rim and ending at the base of the neck	BIA	Flat rim, flaring
A3a	Amphora-shaped miniature vessel with flaring rim, narrow neck, one handle starting on the rim and ending on the first part of the body, the body is rounded bitronconic in profile, flat base	BIB	Flat rim, narrowing
A1b	Amphora-shaped miniature vessel with flaring rim, narrow neck, two handles that start symmetrically on the rim and end on the first part of the body, body with rounded bitronconic profile, pointed base	BIIA	Round rim, flaring
A1c	Amphora-shaped miniature vessel, bitronconic in shape, with flaring rim, narrow neck, two handles that start symmetrically on the rim and end at the base of the neck, the base is strongly concave	BIIB	Round rim, narrowing
A3b	Amphora-shaped miniature vessel with flaring rim, one handle that starts from the rim and ends at the base of the neck, narrow neck, body that is globular in profile, rounded base	BIIIA	Bowl rim, flaring
D1a	Cup-shaped vessel, bitronconic in shape, short, with slightly flaring rim, one handle that starts from the rim and ends on the first part of the body, flat base	BIIIB	Bowl rim, narrowing
G2a	Bowl-type vessel, tronconic in shape, recurved rim, with two handles symmetrically placed, starting on the rim and ending in the area of maximum diameter, smooth base	BIVA	Recurved rim, flaring
O1a	Bowl-type vessel, hemispherical in shape, short, with concave rim, two demi-round handles symmetrically placed, starting on the rim, smooth and flaring base	BIVB	Recurved rim, narrowing
		BVA	Interrupted recurved rim, flaring
Base types		**Handle types**	
FIA	Flat base, starting straight with the walls	TIA1	Oblong handle that starts on the rim of the pot
FIB	Concave base, starting straight with the walls	TIA2	Semi-spherical handle that starts on the rim of the pot
FIIA	Flat base, starting concavely with the walls	TIB	Oblong handle that starts on the rim of the pot and ascends higher than the rim
FIIB	Concave base, starting concavely with the walls	TIIA	Oblong handle that starts on the body on the pot
FIIIA	Flat base that, starting concavely with the walls	TIIB	Hemispherical handle that starts on the body of the pot
FIIIB	Concave base, starting convexly with the walls	TIIIA1	Hemispherical knob, unperforated

FIVA1	V-shaped round base	TIIIA2	Knob that is regtangular in profile and looks like a handle from the front, unperforated
FIVA2	V-shaped concave base	TIIIA3	Very small, conical, unperforated knob
FIVA3	Concave base	TIIIB1	Knob that is hemispherical in profile, oval from the front, unperforated
FIVB	V-shaped base	TIIIB2	Knob that is hemispherical in profile, ovoid-shaped from the front, with an alveolus along the middle
FIVC1	Hemispherical base		
FIVC2	Concave hemispherical base		
FVA1	Thick base, joined to the pot		
FVA2	Thick base, joined to the pot, concave		
FVIA1	Rounded base, ending in an outer protuberance		
Incised ornaments		**Burnished ornaments and grooves**	
OIC1	Multiple vertical incisions, placed close togheter on the body of the pot	OLC1	Narrow horizontal groove between the neck and the body of the pot
OIC2	Tho horizontal incisions, parallel, with a row of circular incisions in the middle	OLC2	Wide horizontal groove placed on the body of the pot
OIC3	Tree vertical incisions on the body, with burnished duct	OLC3	Oblique grooves on the body of the pot (V-shaped)
OIC4	Vertical incision on the body of the pot	OLC4	One wide horizontal groove, with sligtly raised edges, on the body of the pot
OIC5	Horizontal incision on the body of the pot that reaches the lower part of the handle (the upper edge of the body)	OLC5	One wide horizontal groove, with the edges slightly raised, wich is interrupted by a conical elevation made of the clay extracted from the groove
OIC6	Four short vertical incisions (approx. 6 mm) on the vessel's body	OLC6	Two narrow grooves, shallow (superficial), without raised edges, around the pot
OIG1	Three vertical incisions on the neck of the pot	OLT1	Wide groove along the handle
OIG2	Horizontal zigzag incisions on the neck of the pot		
Ornaments consisting of alveoli and pricks		**Applied decorations**	
OAC1	Numerous small pricks, ovoid in shape, vertically placed on the body of the pot	OApG1	Three clay rolls with horizontal pricks along their entire length, applied vertically to the neck of the pot
OAC2	Horizontal row of ovoid-shaped pricks on the body of the pot	OApG2	Three vertical girdles on the neck
OAC3	Horizontal row of triangular procks on the body of the pot, right below the neck, all around it	OApC1	Thin girdle (crest-shaped) applied horizontally on the body of the pot, along its entire diameter
OAC4	Alveoli girdle with round alveoli	OApC2	Narrow girdle (crest-shaped) applied vertically on the body of the pot
OAC5	Alveoli girdle with narrow oblique alveoli	OApC3	Narrow girdle (crest-shaped), very brief (4 mm), very short (0.13 mm) applied vertically on the body of the pot
OAC6	Alveoli girdle with round alveoli, much deeper and rounder than in the case of OAC4	OApT1	Vertical crest applied on the length of the handle
OAB1	Alveoli on the rim		
Brushstrokes ornaments		**Comb-made ornaments**	
OBeC1	Horizontal *besenstrich* on the body of the pot	OPC1	Horizontal + oblique *kammstrich* on the body of the pot
OBeC2	Oblique *besenstrich* on the body of the pot	OPC2	Oblique *kammstrich* on the body of the pot

OBeC3	Vertical *besenstrich* on the body of the pot	OPC3	Horizontal + oblique *kammstrich* on the body of the pot
OBeC4	Horizontal + oblique *besenstrich* on the pot	OPC4	Horizontal *kammstrich* on the body of the pot
OBeC5	Vertical + oblique *besenstrich* on the body of the pot		
Notched ornaments		**Perforated ornaments**	
OCB1	Vertical narrow notches on the rim	OPeC1	Circular perforation through the wall of the body of the pot

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Fig. 29. Location of the archaeological site in Dudeștii Vechi – *Cociohatu Mic* (Google Earth).

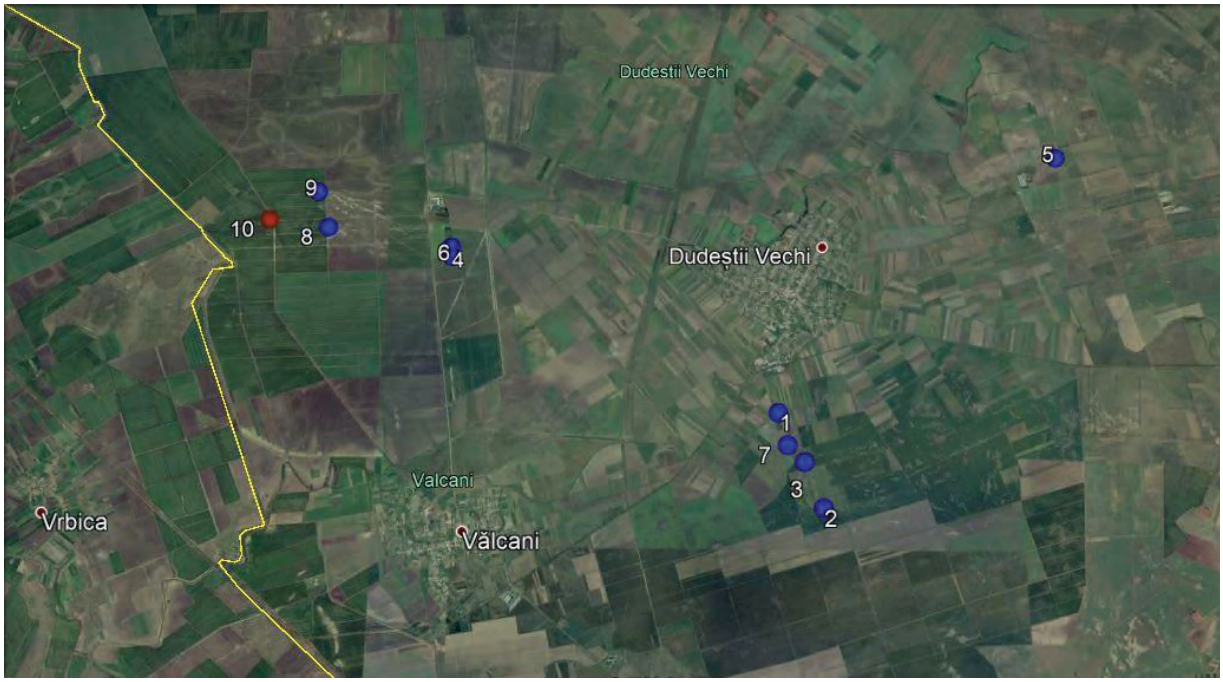

Fig. 30. Location of the Bronze Age archaeological sites on the territory of the municipality of Dudeștii Vechi. Numbers 1 to 9 were attributed in the same order in which they are mentioned in the present study, while number 10 (marked with a red dot) represents the site in *Cociohatul Mic* (Google Earth).

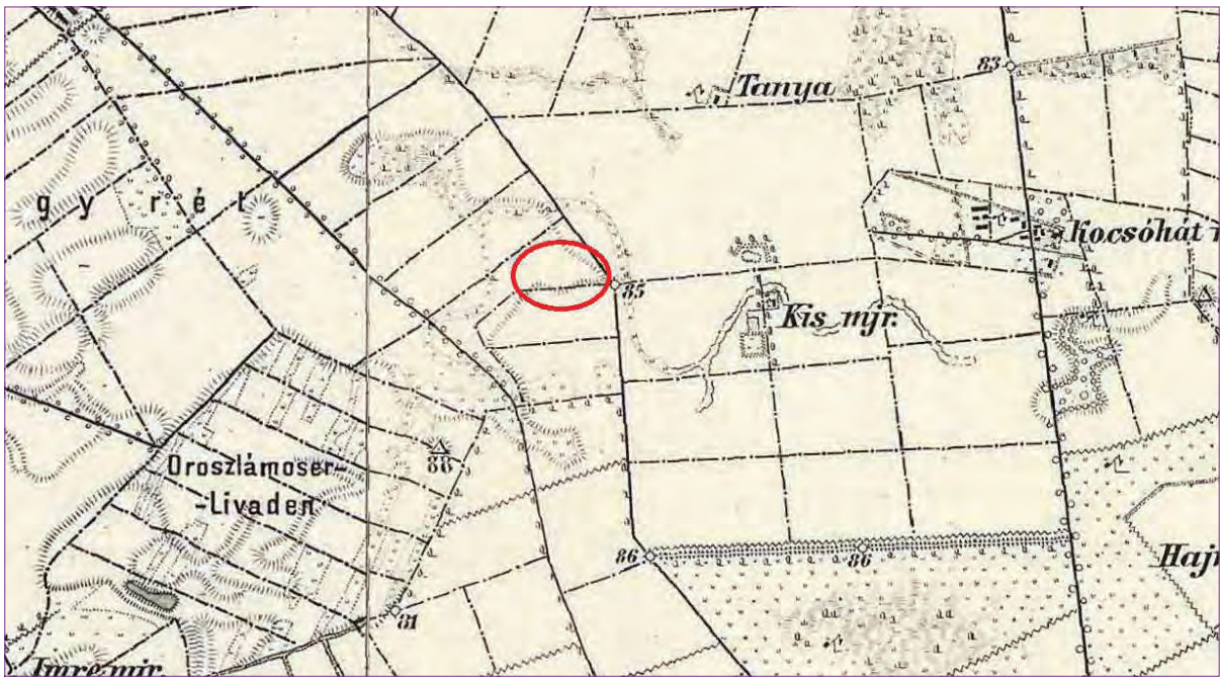

Fig. 31. The archaeological site in Dudeștii Vechi – *Cociohatul Mic* on the third Habsburg topographic map (1869–1887) (www.mapire.eu).

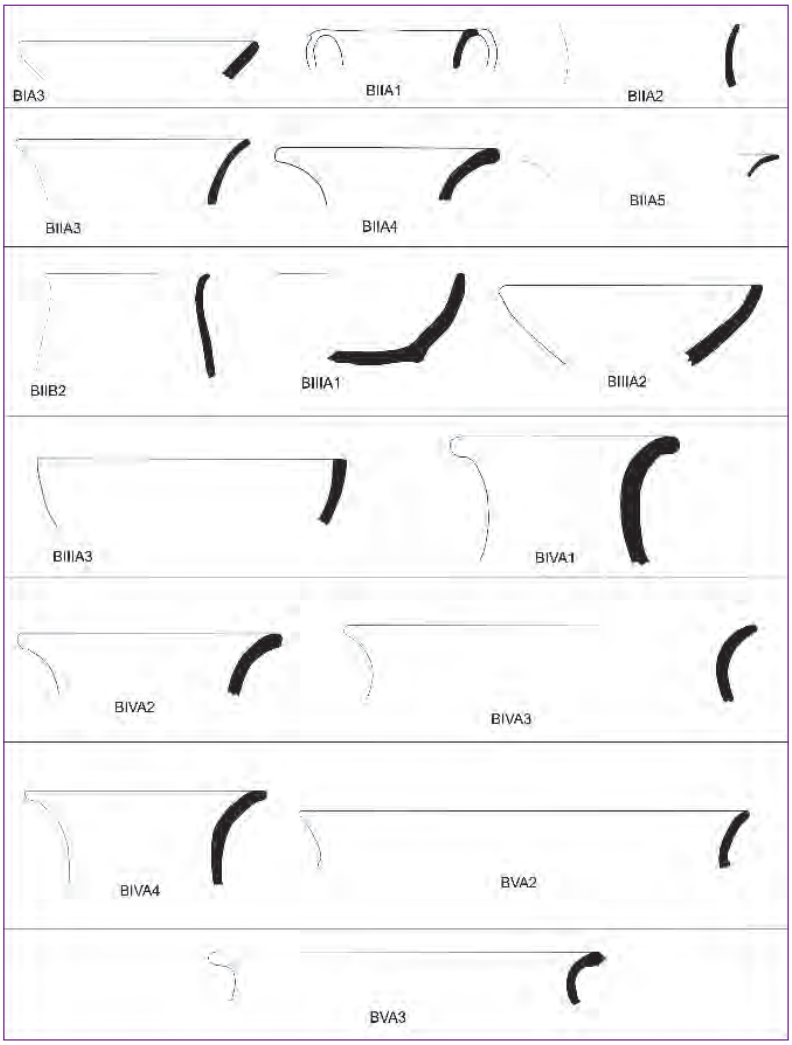

Fig. 32. Upper pot part (rim) typology.

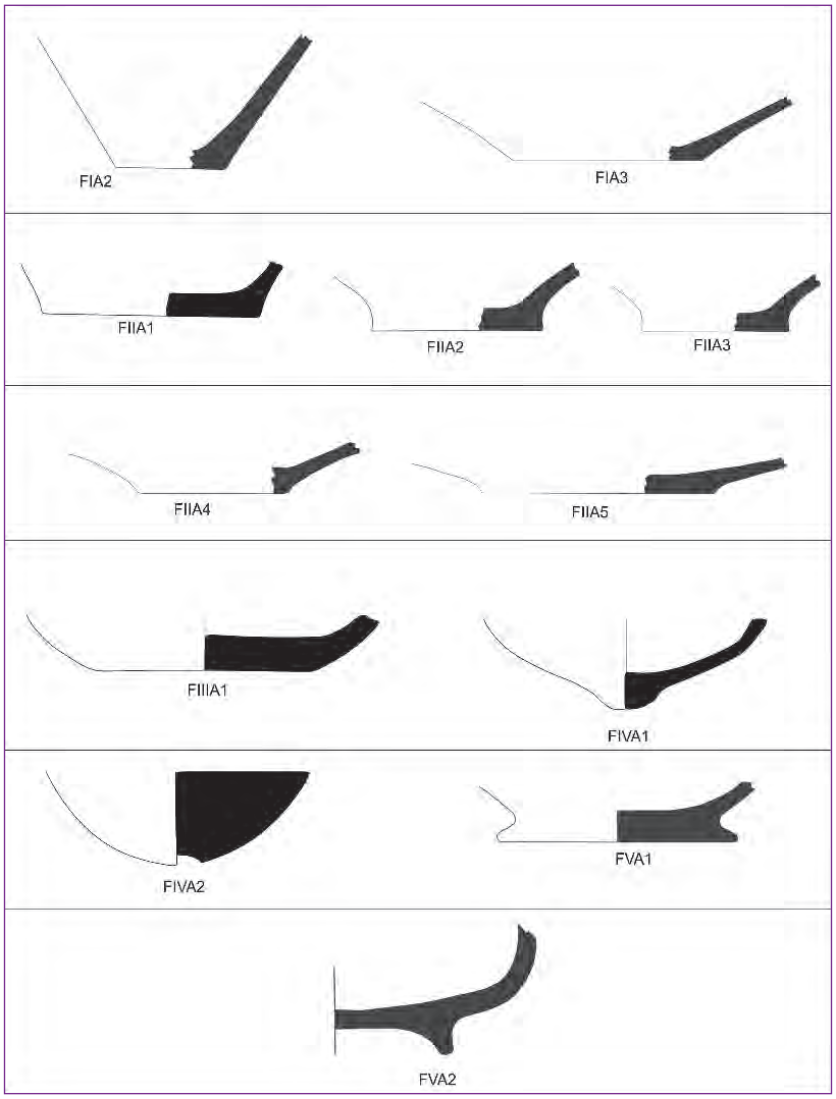

Fig. 33. Lower pot part (base) typology.

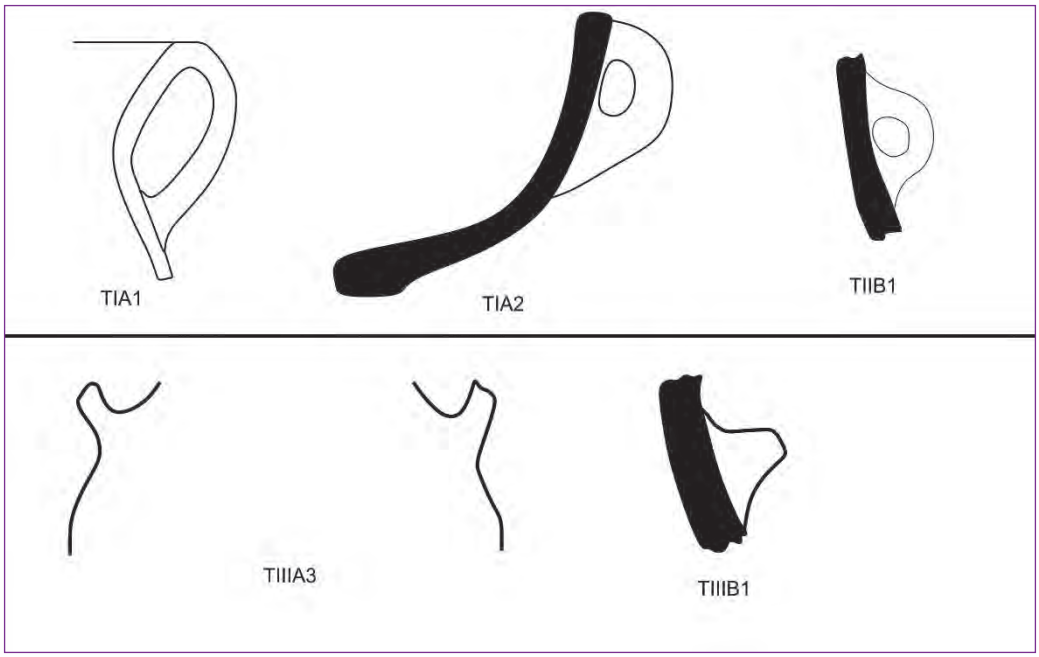

Fig. 34. Typology of handles.

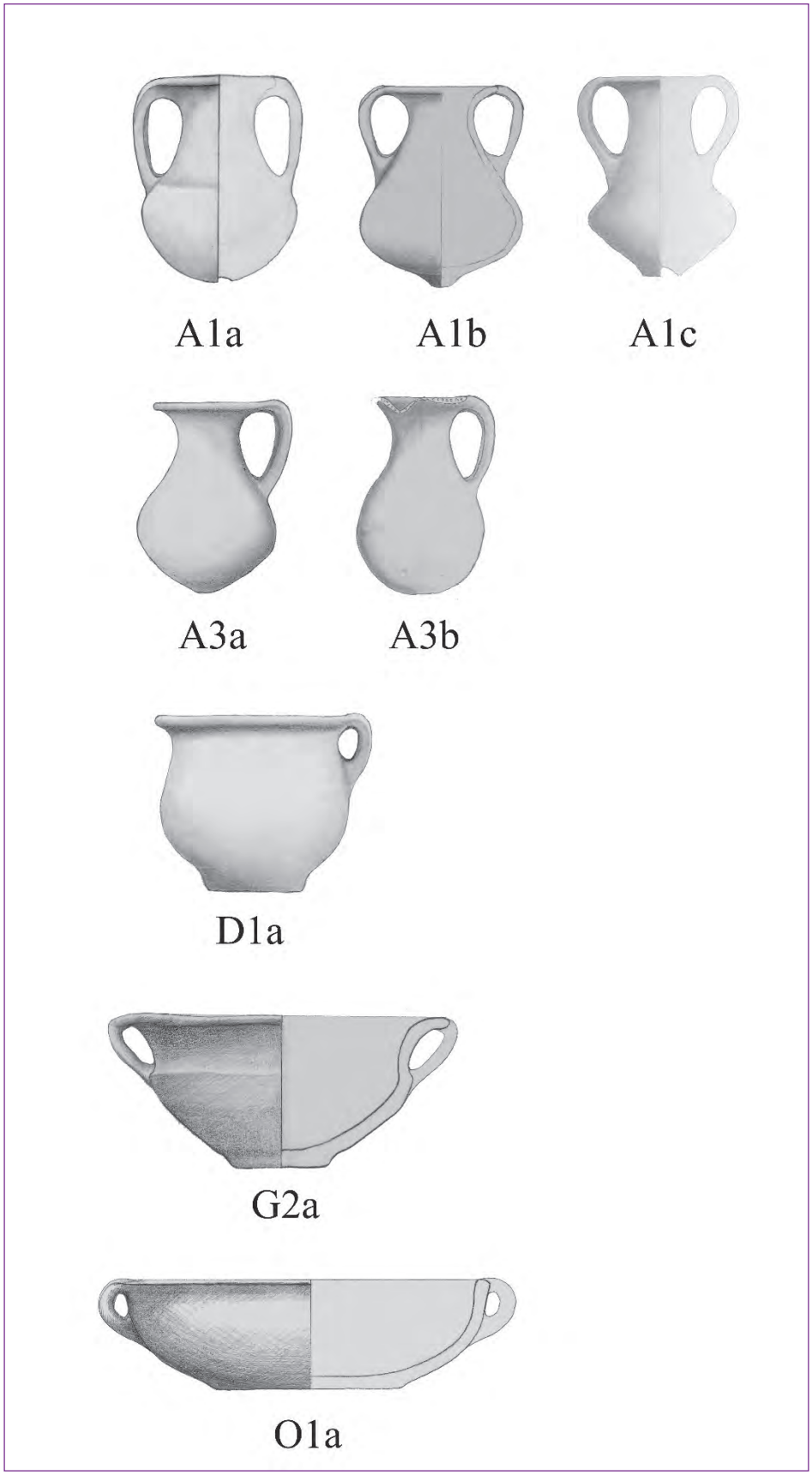

Fig. 35. Pot shape typology.

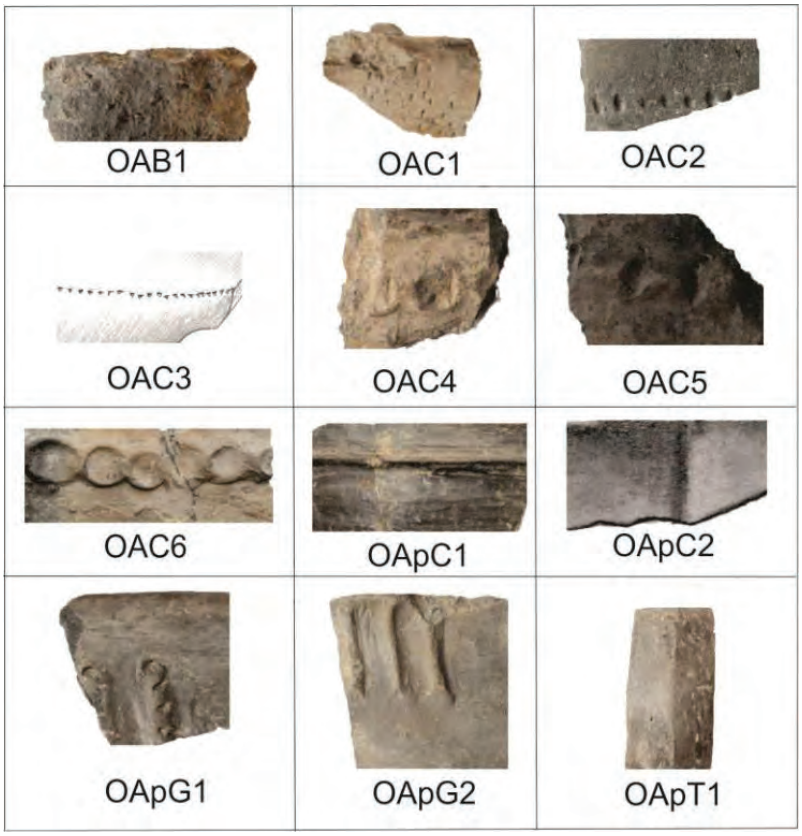

Fig. 36. Typology of decorations: alveoli, pricks, and applied decorations.

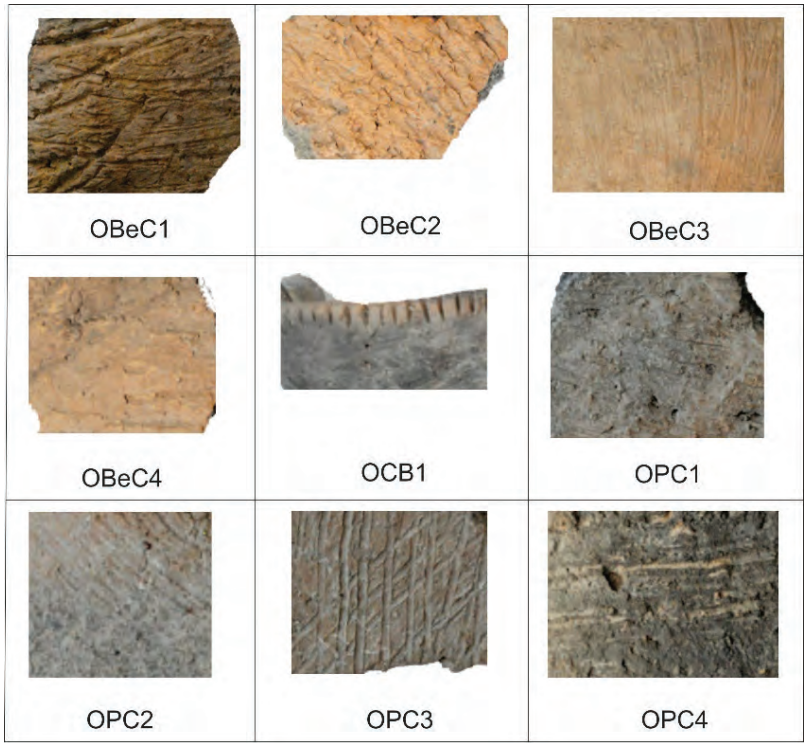

Fig. 37. Typology of decorations: *besenstrich,* notches, *kammstrich*.

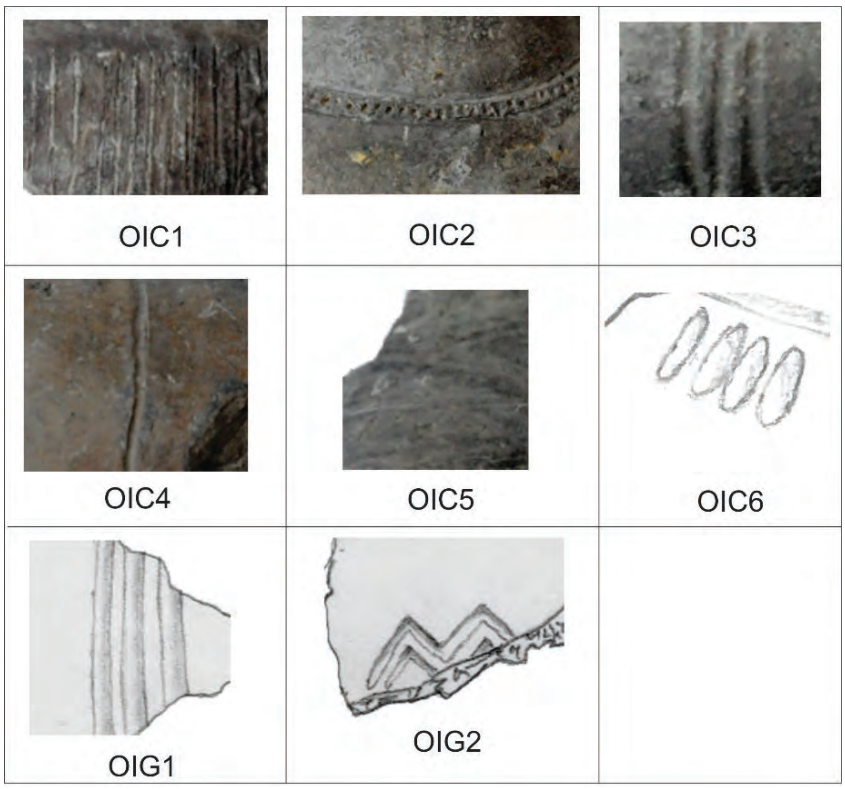

Fig. 38. Typology of decorations: incisions.

Fig. 39. Typology of decorations: burnished, grooves, perforations.

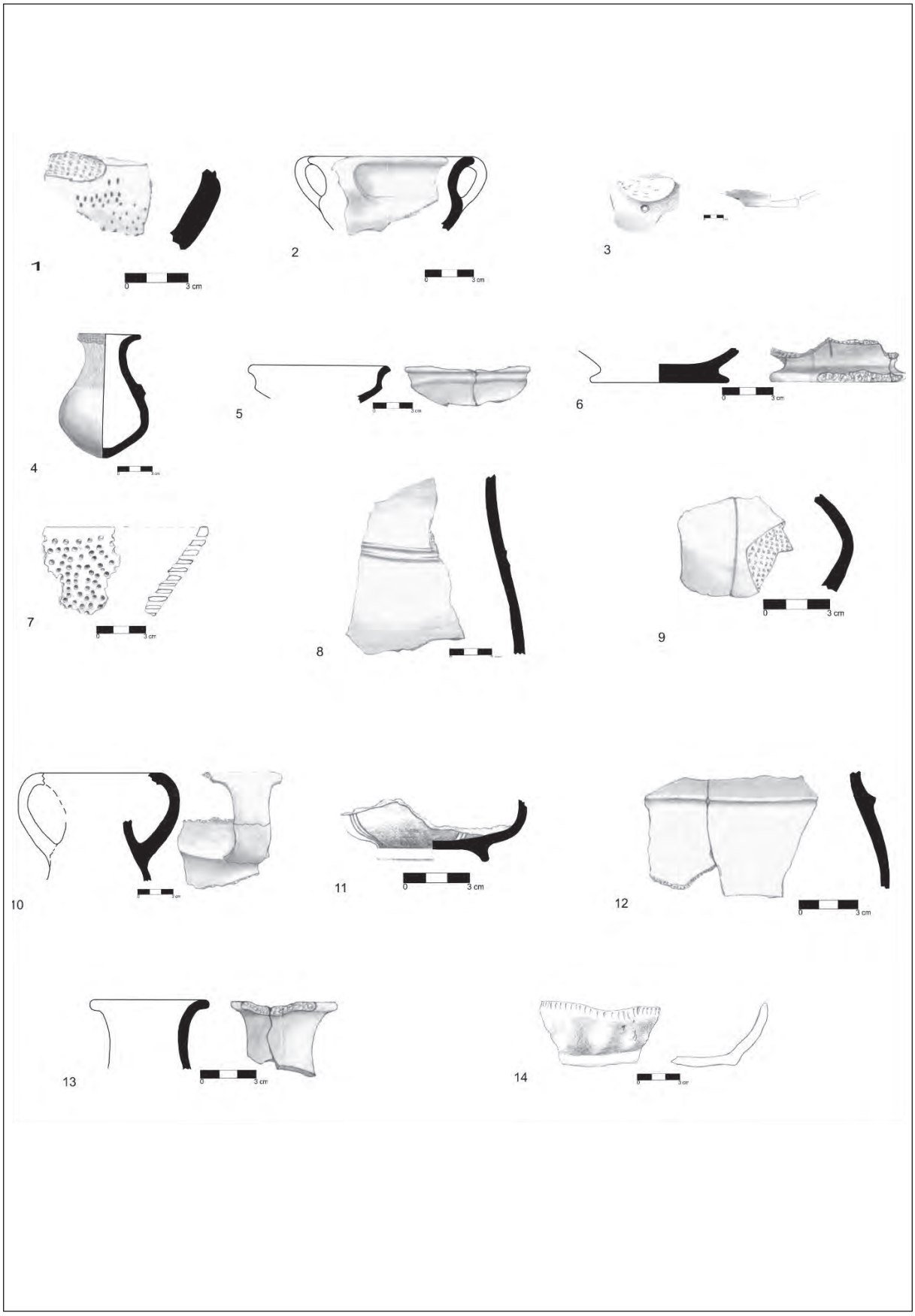

Plate I. 1–4. Pottery fragments from cx. 16; 5–14. Pottery fragments from cx. 31.

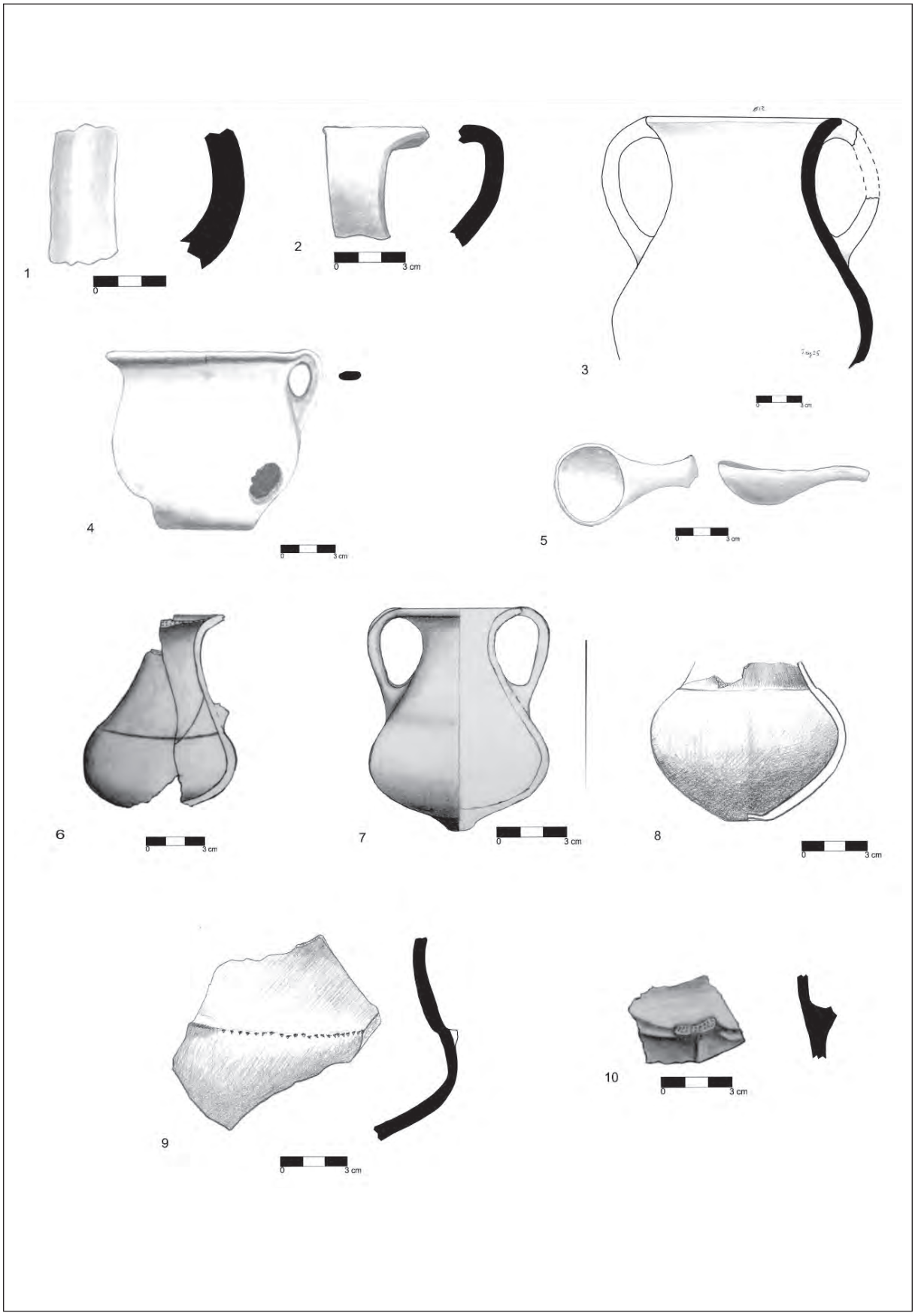

Plate II. 1. Pottery from cx. 52; 2. Pottery from cx. 53; 3–5. Pottery from cx. 57; 6–7. Pottery from cx. 60; 8–10. Pottery from cx. 70.

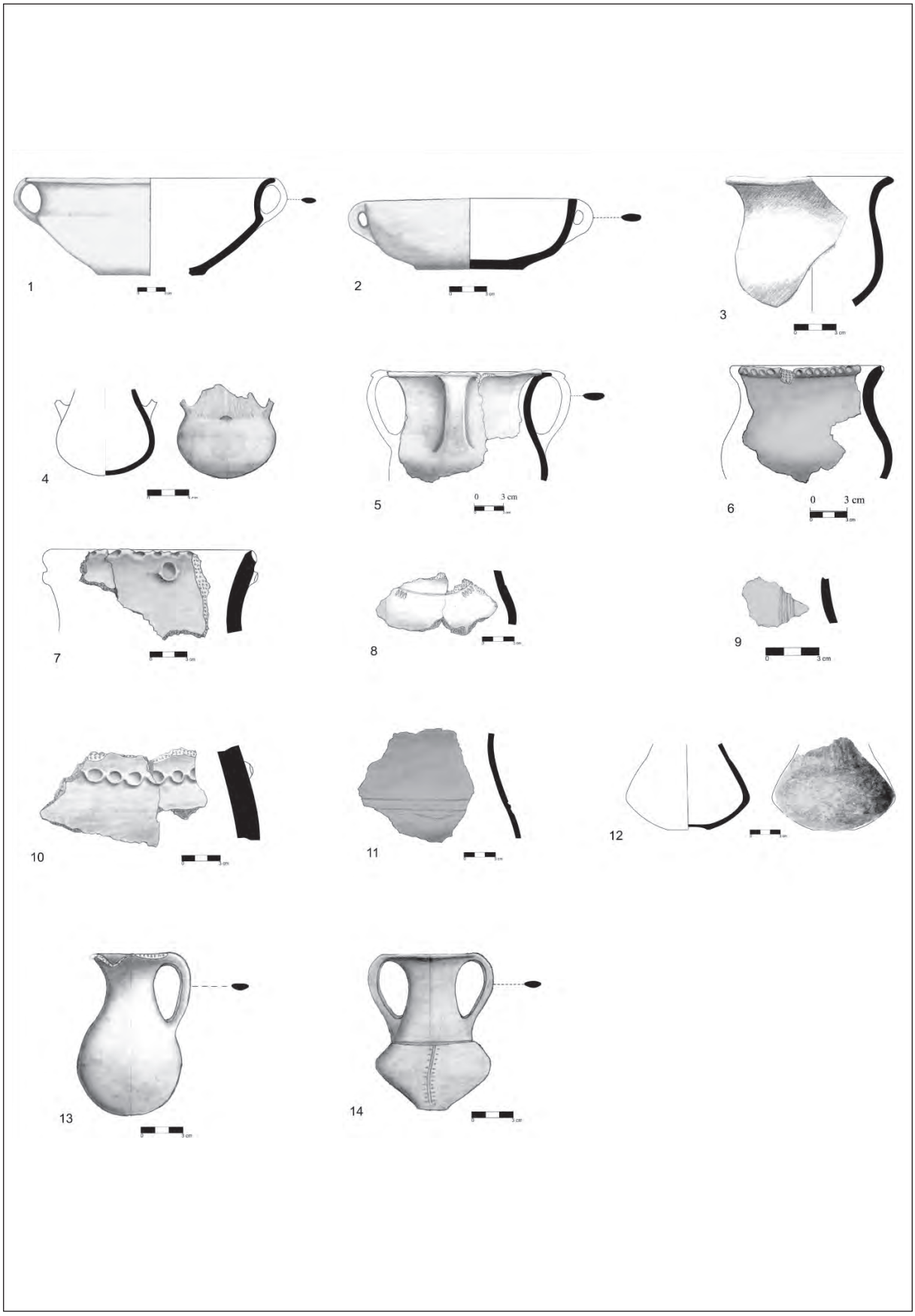

Plate III. 1–14. Pottery from cx. 87.

Plate IV. 1–2. Pottery from cx. 30; 3. Pottery from cx. 31; 4. Pottery from cx. 52; 5–8. Pottery from cx. 53; 9. Pottery from cx. 70.

Abbreaviations

ActaArchHung	Acta Archaeologica Academiae Scentiarum Hungaricae.
AAC	Acta Archaeologica Carpathica, Cracow.
ActaMN	Acta Musei Napocensis, Cluj-Napoca.
ActaMP	Acta Musei Porolissensis, Zalău
AnArchRessoviensia	Analecta Archaeologica Ressoviensia, Rzeszów.
AAS at CEU	Annual of Medieval Studies at CEU, Budapest.
Apulum	Acta Musei Apulensis – Apulum, Alba-Iulia.
Alba Regia	Alba Regia, Székesfehérvár.
Antaeus	Antaeus, Budapest.
Arrabona	Arrabona, Győr.
ArhMed	Arheologia Medievală, Cluj-Napoca, Brăila, Reșița.
ArchBaltica	Archaeologia Baltica, Vilnius.
Arch.Inf	Archäologische Informationen.
ATS	Acta Terrae Septemcastrensis, Sibiu.
ArchÉrt	Archaeologiai Értesítö, Budapest.
Banatica	Banatica, Reșița.
BBMÉ	A Béri Balogh Ádám Múzeum Évkönyve, Szekszárd.
BUFM	Beiträge zur Ur- und Frühgeschichte Mitteleuropas.
BCMI	Buletinul Comisiei Naționale a Monumentelor, ansambluri situri istorice. București.
CommArchHung	Communicationes Archaeologicae Hungaricae, Budapest.
CCA	Cronica Cercetărilor Arheologice, Comisia Națională de Arheologie, București.
CIL	Corpus Inscriptionum Latinarum, Berlin.
CMA	Complexul Muzeal Arad.
Dolgozatok	Dolgozatok az Erdélyi Múzeum érem- és régiségtárából, Cluj.
Dolg.	Dolgozatok a Magyar Királyi Ferencz József Tudományegyetem Archaeologiai Intézetéből, Szeged.
Dolg. ÚS	Dolgozatok az Erdélyi Múzeum Érem- és Régiségtárából, Új Sorozat. Cluj-Napoca / Kolozsvár.
EphNap	Ephemeris Napocensis, Cluj-Napoca.
HOMÉ	A Hermann Ottó Múzeum Évkönyve. Miskolc.
JAHA	Journal of Ancient History and Archaeology, Cluj-Napoca.
JAM	Jósa András Museum, Nyíregyháza.
JPMÉ	Janus Pannonius Múzeum Évkönyve.
JRGZM	Jahrbuch des Romisch-Germanischen Zentralmuseums, Mainz.
KRRMK	Kaposvári Rippl Rónai Múzeum Közleményei, Kaposvár.
LMI	Lista monumentelor istorice, updated in 2015.
MittArchInst	Mitteilungen des Archäologischen Instituts der Ungarischen Akademie der Wissenschaften.
MOL	Magyar Olaj- és Gázipari Részvénytársaság / Hungarian Oil and Gas Public Limited Company
Marisia	Marisia, Târgu Mureș.
NyJAMÉ	A nyíregyházi Jósa András Múzeum Évkönyve, Nyíregyháza.
PBF	Praehistorische Bronzefunde. Berlin.
Przegląd Archeologiczny	Przegląd Archeologiczny, Wrocław.
Rad	Jósa András Museum, Archaeological Archive
RégFüz	Régészeti Füzetek, Budapest.

RKM	Régészeti Kutatások Magyarországon/Archaeological Investigations in Hungary, Budapest.
RAJ Arad	Repertoriul Arheologic al Mureșului Inferior. Județul Arad. Timișoara 1999.
RAN	Repertoriul Arheologic Național.
Sargetia	Sargetia. Acta Musei Devensis, Deva.
SCIV(A)	Studii și Cercetări de Istorie Veche și Arheologie, București.
SGB	Studii de Geografie a Banatului, Timișoara.
SIB	Studii de Istorie a Banatului, Timișoara.
Slavia Antiqua	Slavia Antiqua, Poznań.
SlovArch	Slovenská Archeolóogia, Nitra.
SMK	Somogyi Múzeumok Közleményei, Kaposvár.
SovArh	Sovetskaja Arheologija, Moskva.
SRTM	Shuttle Radar Topography Mission.
StudiaUBB Historia	Studia UBB Historia, Cluj-Napoca.
SzKMÉ	A Szántó Kovács Múzeum Évkönyve, Pécs.
Századok	Századok, Budapest.
Terra Sebus	Terra Sebus. Acta Musei Sabesiensis, Sebeș.
Tibiscum S. N.	Tibiscum S. N., Caransebeș.
TransRev	Transylvanian Review, Cluj-Napoca.
ZalaiMúz	Zalai Múzeum, Zalaegerszeg.
ZSA	Ziridava. Studia Archaeologica. Arad.
Živa Antika	Živa Antika, Skopje.