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Early Neolithic Pottery from Blagotin, Central Serbia: A Use-Alteration Analysis

by Jasna Vuković

Abstract

Functional analyses of the Early Neolithic pottery assemblages from the Balkans are completely lacking. Detailed functional analysis of ceramic assemblage from structure 03 from Blagotin was conducted and use-alteration analysis yielded most important results. It was focused on identification, distribution and frequency of use-wear traces and surface accretion on the outer and inner surfaces of pottery. Results revealed that it was possible to determine basic functional classes of pottery: food processing, cooking and storage. Comparison of the results of use alteration and morphological analyses allowed a more elaborate division into functional classes: long- and short-term storage, food processing and different forms of cooking, such as boiling and parching of foods.

The archaeological site of Blagotin is located in the village of Poljna, 26 km north of Trstenik, in central Serbia. The site is situated on a gentle slope, with the hill of Blagotin on its north and the seasonal Blagotin brook on its south. Archaeological finds from Poljna were first mentioned at the beginning of 20th century[1]. Systematic excavations began in 1989 and it was established that Blagotin was a multi-layer site, with several layers belonging to several Prehistoric periods – from Early Neolithic to Iron Age[2].

Pottery finds from Blagotin are numerous. So far, the only published analysis of pottery finds has been conducted for the structure 03, but it seems that the situation is similar in the other structures. Analysis was conducted in several stages: the first stage involved putting the vessels together. Only seven intact vessels were found in this structure, but 38 more vessels were restored in the first stage of analysis. The distribution of fragments showed that fragments that could be joined together were scattered around the whole area of the structure 03 and through all excavated layers. It is possible that a pit dwelling, damaged by fire, was first abandoned then used as garbage pit. A total of 15.883 fragments and whole vessels have been analyzed[3].

Some Methodological Issues

Pottery analysis from structure 03 wouldn't be complete without functional analysis. Although a morphological analysis was conducted (i.e. analysis of dimensions and proportions – ratios between different morphological parameters: height, diameter, volume etc, as well as analyses of shape and wall curvature)[4], use alteration analysis yielded important conclusions. It was focused on identification, distribution and frequency of use-wear traces and surface accretion on outer and inner surfaces of pottery. Results revealed that it was possible to identify basic functional classes of pottery: food processing, and cooking and storage. Comparison of the results of use alteration and morphological analyses allowed a more elaborate division within functional classes: long- and short-term storage, different forms of cooking, such as boiling and parching, and vessels for individuals and groups to be served from and from which they could eat. Since use-wear traces are lacking on the vessels with the function of serving and consuming foods and liquids, this functional class is excluded from this study.

Use-wear traces were identified according to the works of David Hally and James Skibo[5]:

1) Surface attrition, defined as the removal or deformation of ceramic surfaces[6]. Basic division was established according to traces that were caused by mechanical damage of the pottery surface: abrasion processes during cooking, cleaning, storing and manipulating of pots. A different kind of damage, so-called surface pitting or surface erosion, was caused by non-abrasive processes, mainly chemical processes that ocurred within the contents of the vessel.
2) Surface accretion refers to carbon deposits in the interiors and soot on the exteriors of the vessels. Carbon deposits are caused by the combustion of organic material and the depositing of the carbonized matter into the porous walls. Distribution patterns of carbon deposits provide the means for more detailed divisions within the functional class of cooking vessels: heating food in the absence of water, as well as wet-mode cooking[7]. Soot deposits that accumulate on the exteriors of the vessels are by-product of fuel combustion[8] and their distribution provides information about how the pot was positioned over a fire and the manner of cooking.
3) Oxidation discoloration on the exteriors also shows how the pot was positioned over a fire. As Hally has pointed out, oxidized patches usually can be attributed to accidents that occur during vessel firing, but in case of cooking vessels color variation can be attributed to exposure to the cooking fire[9].

1 Васић 1906.
2 Vuković 2004; Nikolić – Zečević 2001.
3 Vuković 2004.
4 Vuković 2006.
5 Hally 1983; Hally 1986; Skibo 1992.
6 Skibo 1992, 106.
7 Skibo – Blinman 1999, 180 f.
8 Hally 1983, 7.
9 Hally 1983, 11.

Pottery Assemblage from Structure 03: Use-Wear Traces and Function

The major difficulty in use-alteration analysis of pottery finds from Blagotin is the fact that they are highly fragmented. Different kinds of use-wear traces occur on different parts of a vessel, so the analysis of incomplete pots or individual fragments would be insufficient, if not misleading. However, there is a considerable number of whole, as well as partly-reconstructed vessels. They probably don't represent a valid statistical sample, but they allow use-alteration analysis, as well as some considerations about food habits and activities related to food preparation and the manipulating of pots.

Class A1: Food Processing

A total of 10 vessels[10] from OB03 showed intensive surface pitting on the interior walls and base. Main characteristic of vessels with this kind of inner-wall use-alteration is that damage traces start about 2–3 cm below the rim and most damaged area is lower belly and the base (Fig. 1a – b). Carbon deposits and sooting clouds are lacking. These vessels were completely worn out – some bases are so heavily damaged they aren't preserved at all – so the conclusion is that they were discarded in the garbage pit because they weren't suitable for any secondary use. Vessels with this kind of use alteration are, as a rule, open vessels, hemispherical or deep conical bowls of similar dimensions (rim diameter 18–25 cm, volume 3–5 l and height 12–16 cm). They usually have traces of mechanical damage on the exteriors, which means that they were handled and moved a lot. Since all kinds of surface accretion are lacking, it is clear that they were used for food preparation not involving heating, such as the soaking of cereals. It is known that production of highly acidic food results in the erosion of the inner walls of the vessel, so it is very possible that chemical processes like fermentation or even brewing occured[11].

Class A2: Cooking

Cooking vessels are identified by the presence of carbon deposits, sooting clouds and oxidized patches on the vessel's walls. This kind of use-wear traces seems lacking in the majority of vessels called ›cooking pots‹ in traditional typology[12]. However, open vessels, i. e. bowls of different dimensions, fabric and surface finishing, show different kinds of surface accretions and their distributional patterns.

Class A2/1: Wet-mode Cooking

Several larger open bowls were obviously used for the cooking of food over a fire. The best example is a hemispherical bowl (volume 4.3 l, height 25 cm, rim diameter 24 cm) with intensive carbon deposits on the whole interior except base (Fig. 2a). Moreover, sooting clouds are also present on the exteriors, in a zone below the rim and in the upper part (Fig. 2b). This means that the vessel was not used on an open fire, but raised above it. On the interiors abraded marks are also present. They may have been caused by abrasive action during washing, but it is more likely that they were caused by stirring the contents with some kind of utensil.

As noted above, a majority of larger, S-profiled vessels have no use wear traces on their walls. However, there are

Fig. 1 a Inner walls of a vessel heavily damaged by non-abrasive processes (photo: S. Đuričić).
b Surface pitting on the inner walls of the vessel caused by non-abrasive processes (photo: S. Đuričić).

10 This group stands out within the pottery assemblage from structure 03: eight of ten vessels were found either in one piece or it was possible to reconstruct them.

11 Vuković forthcoming.

12 In traditional typology there are no established criteria on morphological and other characteristics in the identification of cooking vessels. Usually, larger S-profiled vessels made of coarser material and with uneven surfaces are considered to be cooking pots.

Fig. 2 a Hemispherical bowl with intensive carbon deposits on the whole interior except base (photo: S. Đuričić),
b Sooting clouds on the exteriors of hemispherical bowl (photo: S. Đuričić).

several specimens with carbon deposits in the area from rim to the shoulder. The S-shaped vessel in Fig. 3 is the only decorated vessel with carbon deposits on its interior walls (Fig. 3b). It seems that decoration should be also considered in terms of function. Upper part of the vessel has burnished slip, while the lower part is decorated with incised lines that can be functionally considered as surface roughening (Fig. 3a). Plastic ribs in the zone of the longest diameter of the vessel functionally may be considered as a kind of handles. Roughening and the presence of such ›handles‹ make it easier to manipulate the pot. This kind of intervention, besides the aesthetic effect, allows vessel to serve multifunctional purposes: cooking, but also transport and short-term storage, probably of liquids.

Class A2/2: Dry-mode Heating

The presence of carbon deposits on the base of pots suggests heating of foods in dry-mode, like the parching of seeds. Surprisingly, such use-wear traces appear only on small bowls of fine make. A biconical bowl with burnished slip (Fig. 4a – b) shows dark zones in the lower part and the base on both surfaces. There are no visible oxidized patches, so it must be concluded that the vessel was not positioned on an open fire, but above it.

Fig. 3 a Exterior of decorated S-shaped vessel (photo: S. Đuričić),
b Interior of decorated S-shaped vessel with carbon deposits in a zone from rim to shoulder (photo: S. Đuričić).

Fig. 4 a Exterior of biconical bowl of fine fabric with dark zones in the lower part (photo: S. Đuričić),
b Interior of biconical bowl of fine fabric with dark zones in the lower part (photo: S. Đuričić).

Class C: Storage

The majority of storage vessels are identified by morphological and analysis of formal properties, since use-wear traces usually are lacking in this functional class. They are represented by larger S-profiled pots, with burnished slip inside and different surface treatments on outer walls, often with rib-like handles. They could have been used for storage of dry foodstuffs, such as cereals. On the other hand, pear-shaped vessels with a narrow neck, burnished inner and outer surfaces with slip and four knob-like handles are identified as containers for liquid storage. Sometimes traces of mechanical damage are visible on their outer walls, in zones around the longest diameter and around the perforations of the handles. These traces suggest that vessel was probably tied through the handles with a rope[13].

However, surprisingly again, many traces of mechanical damage are identified within the group of fine pottery. Many of the profiled bowls of fine material have heavily abraded rims and necks (Fig. 5; 6a). Since the temper particles were removed, small pits remained, and the conclusion is that the surface of the rim was in mechanical contact with a harder abrader, like stone or ceramic without organic inclusions[14]. It seems that these vessels were covered with some kind of lid, which caused the abrasion. On the other hand, many of the vessels have use traces along the neck, parallel with the rim (Fig. 5; 6b). These marks may have originated as a result of tying some kind of cover made of soft material, like fur or cloth. Marks parallel with the rim are sometimes visible on the interior walls and they may have been caused by stirring the contents with a utensil. The function of storage is therefore obvious, but it is possible that they have been used for food processing not involving heat as well.

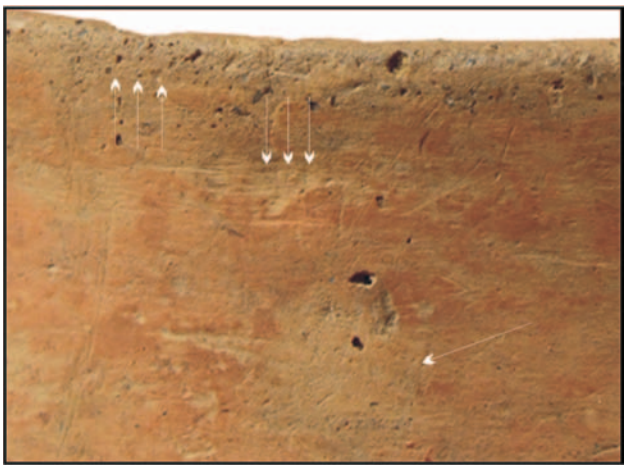


Fig. 5 Upper part of exterior walls of bowl made in fine fabric with heavily abraded rim and neck (photo: S. Đuričić).

Fig. 6 a Upper part of exterior walls of bowl made in fine fabric with heavily abraded rim (photo: S. Đuričić),
b Upper part of exterior walls of bowl made in fine fabric with abraded marks on the neck, parallel with the rim (photo: S. Đuričić).

Discussion

Use-wear trace analysis showed that is possible to determine major functional classes within the ceramic assemblage. Use-marks are identified on three vessel groups: open vessels of medium dimensions, S-shaped vessels and smaller bowls of fine make. Traces can be divided into two basic groups: traces that originated as a result of food preparation (carbon deposits, sooting clouds, traces resulting from non-abrasive processes) and traces that originated as a result of certain activities (abrasion marks on the interiors, which is a result of stirring; abrasion marks on the neck and rim as a result of tying and covering etc.) (Table 1). Use-wear traces are lacking on the large group of vessels, probably used for storage, which suggests they had a static position within the household, i. e. they were rarely moved or handled.

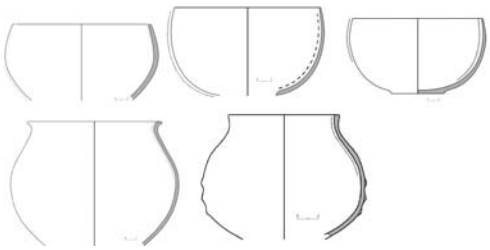
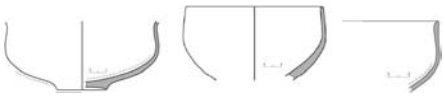
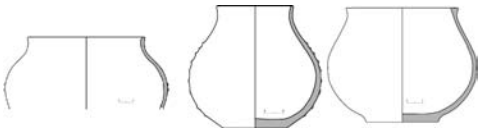
Functional classes of pottery identified by use wear traces are shown in table 2. It clearly reveals that functional analysis has proved to what extent stylistic and typological analyses fall short of providing a comprehensive insight into pottery material. The group of vessels with the function of food processing by non-abrasive processes is typologically diverse. It consists of deeper conical, non-profiled globular and semi-globular bowls. Yet functionally they belong to the same group with important common characteristics: absence of neck, similar dimensions and, most importantly, an open profile. The functional class of wet-mode cooking is even more morphologically diverse: it consists of non-profiled bowls and S-profiled vessels. Some authors suggest that vessels with the function of boiling have open profiles for adding

13 Vuković 2006, 176 f.

14 Schiffer – Skibo 1989,108–111; Skibo 1992,108–110.

use-wear traces	pottery classes	exterior walls					interior walls				
		rim	neck	shoulder	belly	base	rim	neck	shoulder	belly	base
abrasion	open vessels of medium dimensions			x	x	x				x	
	smaller bowls of fine fabric	x	x	x		x			x		
	S-profiled vessels										
non-abrasive processes	open vessels of medium dimensions								x		
	smaller bowls of fine fabric								x		
	S-profiled vessels										
sooting clouds	open vessels of medium dimensions			x							
	smaller bowls of fine fabric				x	x					
	S-profiled vessels										
carbon deposits	open vessels of medium dimensions						x			x	
	smaller bowls of fine fabric									x	x
	S-profiled vessels						x	x	x	x	
oxidation discoloration	open vessels of medium dimensions				x						
	smaller bowls of fine fabric										
	S-profiled vessels										

Tab. 1 Use-wear traces and their position on different kinds of vessels.

function			shape
food processing	with heat	wet-mode	
		dry-mode	
	without heat		
storage/transport	short-term	dry content	
		liquid content	
	long-term	dry content	
		small amounts of goods	

Tab. 2 Functional classes of pottery identified by use wear traces.

and removing food, but the low neck prevents boiling over and reduces evaporation[15]. According to the recent results of chemical analyses of pottery residues, it is possible that different shapes of pots were used for cooking different types of foods[16] and for different cooking techniques[17]. As Eerkens suggests, pots designed for high-temperature boiling tend to have larger and unrestricted openings, while S-profiled walls are better suited for stewing and simmering activities (e.g. 97). In the case of the Blagotin assemblage, this issue, although worth considering, should remain open, since the results of chemical analyses are not available yet.

Another very important issue in the study of Early Neolithic ceramics is the issue of fine pottery. In the literature, it is always considered to be some kind of luxury ware or display pottery with no utilitarian purpose, or with the function of serving and consuming of food and liquids. The main argument is that fine pottery is less frequent within the assemblages than the other kinds. However, functional analysis revealed that bowls of fine material and with burnished slip were used in almost the same way as the other functional classes of pottery. Since this kind of pottery is less frequent than the others, the only conclusion is that these vessels had a longer life than the others and their breakage rate was lower. This means that they weren't moved and manipulated frequently, and were therefore more static than the other classes. The function of storage of goods stored in small amounts (herbs for example) is obvious. Many of the specimens don't have any kind of use wear traces, so the function of serving and consuming also remains.

Finally, it should not be forgotten that many of the vessels were multifunctional, which is, as some authors suggest, one of the important characteristics of early pottery[18]. One of the vessels with traces of non-abrasive processes, for example, has oxidized patches on the lower part of its exterior walls, as well as a small patch of soot on the belly (Fig. 7). Thus, it was used over an open fire, as well as for food processing. The S-profiled decorated vessel shown in Fig. 2 was likely used, as noted before, for several purposes: cooking, transport and storage.

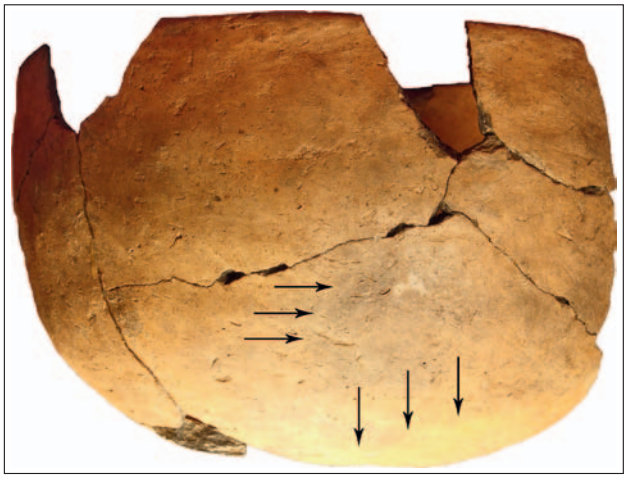


Fig. 7 Exterior of a bowl with oxidized patch in the lower part and patch of soot on the belly (photo: S. Đuričić).

Conclusion

Functional analysis, as shown in the Blagotin assemblage, is very useful in identifying not only the function of pottery vessels, but also in revealing certain aspects of food habits, as well as behavioral patterns related to vessel use and food preparation.

It should be noted, however, that functional analysis is not meant to merely make conclusions about Early Neolithic communities in general, but rather to establish differences between archaeological contexts within one archaeological site, as well as functions of different contemporary sites. For example, large open conical bowls were most frequent in the pottery assemblage from Blagotin. No use-wear traces were identified on them, so it was very difficult to identify their function. They were put in the group of vessels for short-term storage, probably of liquids – water – for everyday use in the household. In the ceramic assemblage from Early Neolithic phase at Lepenski Vir[19] large open conical bowls also predominate. Typologically they are almost the same as the examples from Blagotin. However, there is a major difference between the two sites. Almost all fragments of conical bowls from Lepenski Vir have intensive carbon deposits on the interiors and sooting clouds on the exteriors of the vessels, so there is no doubt that they were used for cooking food. This fact shows that the cooking habits of the inhabitants of these two sites were completely different. Unfortunately no functional analyses of pottery have been conducted on the assemblages from other Early Neolithic sites in the Balkans as yet. Therefore, a comparative functional analysis of pottery from several sites is very much needed. With analyses done, we will have better insights into the everyday life of the people of the Starčevo culture.

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