Pottery typology and the monochrome Neolithic phase in the Republic of Macedonia

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For Trajanka Jovčevska (1959–2013)

Abstract

The beginning of the Neolithic way of life in The Balkans is widely accepted as a multi-faceted and complicated process, imported, triggered or influenced from more than one external source. The variety of aspects resulted in lively debates. This paper intends to contribute by presenting typological profile of the pottery assemblage of Grnčarica (a Neolithic settlement in Macedonia); a profile which does not match the obtained ^{14}C dates. Possible explanations are given and further reconsideration of the chronological frame of the Balkan Neolithic (established half a century ago) is suggested.

Introduction

Between 2007 and 2009, threatened by the building of the Zletovica hydro – system network in Northeastern Macedonia, thirty-three archeological sites were excavated. Some of them were already registered in the national cultural heritage register; others were discovered only by the machines that were digging the pipe-line. The second was the case with Grnčarica, the only Neolithic site from the lot. The fieldwork for this specific site was directed by Trajanka Jovčevska, and the entire Zletovica project was coordinated by Prof. Trajče Nacev.

Since the first discovered Neolithic potsherds, the impression of the entire team was that we are dealing with a very early Neolithic site, possibly the earliest so far from the Republic of Macedonia (Нацев 2008). This impression lasted throughout the entire excavations and, among some of the team members, until today. That is why the first radio-carbon dating results came as a surprise. Instead of a "monochrome" phase settlement (pre – 61st century cal BC), according to the established chronological sequence by Gimbutas (1976), it turned out that Grnčarica existed at the end of the Early, or even well into the Middle Neolithic (57th–58th century cal BC). Another sample from the same context was sent for dating, but it not only confirmed the "young" age of the site, it even returned a result one century younger than the previous sample. The debates that started among the Macedonian scholars ranged from complete rejection of the ^{14}C dates, to an almost revolutionary call for complete revision of the old chronology. This paper will present the pottery, the details from the dating and will try to give the possible directions for future interpretation.

Provenance of the material

During an intensive fieldwork, which lasted almost five months (26.09.2007–28.03.2008 with interruptions), 580 m^2 were excavated. The excavated area contained remains from at least three huts, a human burial under the floor of one of the huts and a pottery kiln in the central area (Fig. 1). Some waste disposal areas were also recorded in what would be the periphery of the settlement. The material that is subject to this paper is only the pottery artifacts that were collected during the excavations. Because of the simple stratigraphy of the site, beside the two obvious - "Neo-

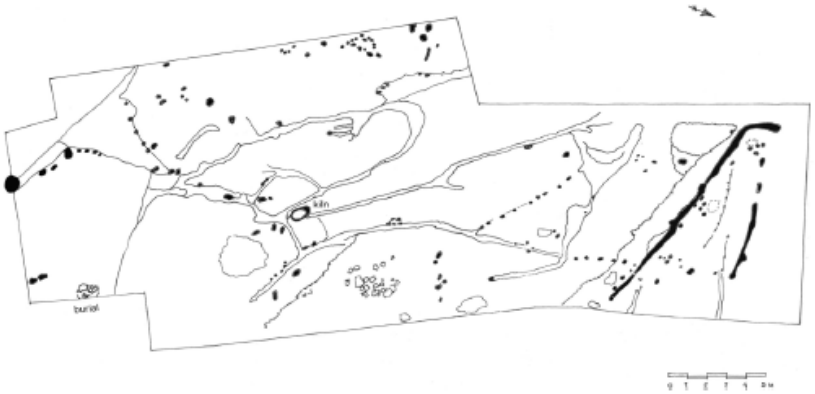


Fig. 1. Ground plan of the central part of the excavated area.

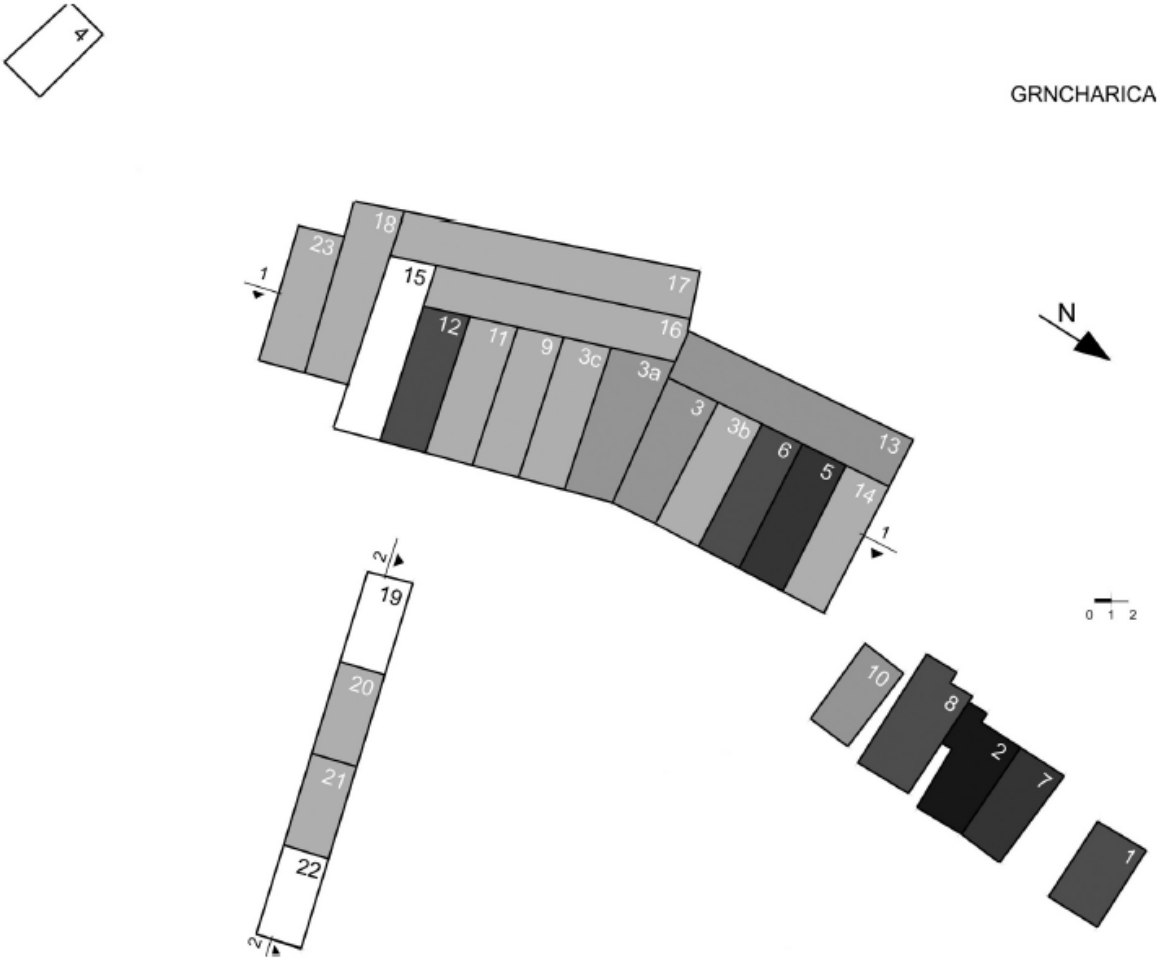


Fig. 2. Trench numbers and pottery density in the excavated area.

lithic" and "Roman Period" groups (there is a Roman villa rustica nearby and some scattered pottery fragments can be found on the Neolithic site), the material is not further divided chronologically. So, the whole Neolithic ceramic material is treated as one group of artifacts, coming from a relatively small settlement, which lived relatively short time, contained entirely by one Neolithic phase. Today this area is known as Grnčarica (grnčar/грнчар/means potter) and it is an agricultural field near the village Krupište in Central Eastern Republic of Macedonia.

The only artifact position recording during fieldwork was marking the trench number and sometimes the spit number. As said before, the material comes from a single cultural layer. The spits were simply marked without giving at least the relative depth. Therefore we dismiss the spit number as an important information, for it will only complicate the picture unnecessarily. What remains is the trench number. In Fig. 2, the excavation plan with the ceramic artifact density by trench for the Neolithic layer is represented. When looking at this representation, one should have in mind that artifact selection was carried out by the excavation director immediately after the excavation. This probably had some influence on the final result in Fig. 2. For example, the extremely high density of pottery shards in trench 2 may represent broken pottery disposal area. But the enormous difference with the central area of the settlement probably comes from the extremely fragmented state of the trench 2 material, further amplified by the post-excavation selection criteria. Nevertheless, this result gives us at least a general difference in spatial artifact distribution at the time of excavation, which might point to different activity areas (households, pottery workshops, waste areas etc.).

There is a total sum of 342 Neolithic ceramic artifacts. Ten of them (two figurine parts, one loom weight, one bracelet fragment and six circular objects) will not be included in the analysis. The assemblage of 332 pottery fragments is

groups	num. of pieces	%
reconstructed vessels	13	3,9
handles	6	1,8
rim fragments	45	13,5
bottom fragments	5	1,5
wall fragments	40	12
rim/neck fragments	30	9
rim/wall fragments	78	23,5
wall/handle fragments	48	14,5
bottom/wall fragments	54	16,2
neck fragment	1	0,3
wall/neck fragment	1	0,3
leg/wall fragments	3	0,9
wall/neck/handle fragment	1	0,3
rim/neck/wall fragments	4	1,2
highly fragmented vessels	2	0,6
rim/wall/handle fragment	1	0,3
total	**332**	**100**

Tab. 1. Groups and quantity of considered ceramic artifacts.

divided into 16 groups, determined by the body part (or combination of body parts) they represent (Tab. 1). Not all of the groups give information for all the typology categories, but they all give contribution to at least one of them.

Techno-Typological approach

Concerning the technological aspects, some general conclusions about the pottery production process in Grnčarica can be drawn. A Number of elements of the settlement, such as the pottery kiln, some specific artifacts and some pathological features on the only discovered skeleton (as proposed by the anthropological analysis) support a local production of the pottery. The main accent is on the shape typology of the assemblage, so no specific methods were applied for detailed technological analyses. Nevertheless, even if only through simple macroscopic observations and basic archaeometry, an attempt can been made to comment the production process (raw material provenance, use of temper, shaping and modeling of the vessel, surface treatment, decoration techniques and the firing process), and typologically group the artifacts on the basis of their technological traits.

The first "highest level" classification is dividing the material into one of the two technological types: coarse and fine. The criterion here is the thickness of the wall, 1 cm being the border line. The artifacts thinner than 1 cm are considered as fine, and those thicker than – or equal to – 1 cm as coarse. Except for the bottoms and handles, all the other artifact groups participate in this typological classification. The diagram produced in Chart 1 represents the number of pottery fragments by wall thickness. As a result, two almost identical groups are produced. The fine category is consists of 163 pieces (or 50,7 % of the pottery assemblage), and the second group counts 158 pieces (49,3 %).

Further observations can be made on the relationship between this and other technological traits of the pottery. For example, it can be noted that the fine pottery is mainly with smooth surface, only 13 % is extremely polished and only 10 % has a rough surface. Also, a large number of the fine pottery pieces (65 %) are slipped. On the other hand, the coarse fragments are mainly with rough or roughly smoothed surface, and only 33 % of them bear some traces of slip.

Another technical feature which can be observed is the use of temper in the clay. Through macroscopic observation only, most of the artifacts permit differentiation of organic from mineral temper, or different size and quantities of mineral temper and observation of the presence or absence of other types of tempers. The organic inclusions might

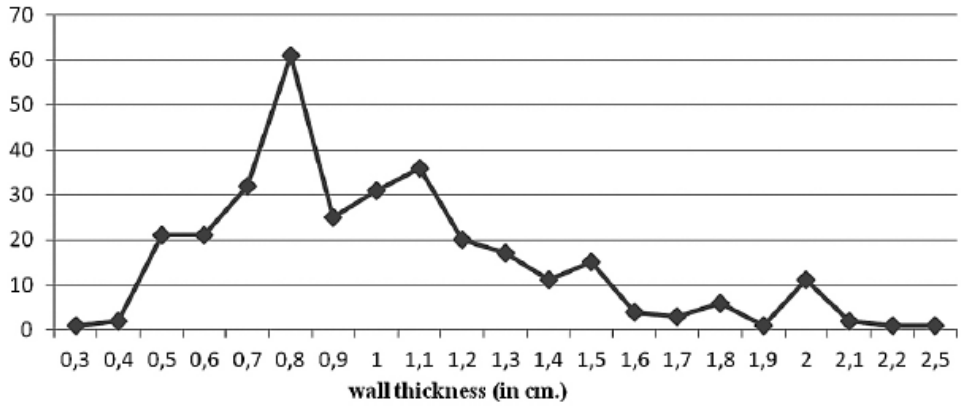


Chart 1. Piece count by wall thickness.

be chaff, plant residues, seeds and even animal excrements (Чохаджиев 2007; Fidanoski 2009). In Grnčarica we find it in almost all the potsherds. There are only around twenty fragments for which additional microscopic observation are necessary in order to confirm. The mineral temper is usually grinded limestone or sand. The mineral inclusions are further divided by the size of the particles into: small (≤ 1 mm), medium (1 -3 mm) and coarse-grained (> 3 mm). Considering the complete pottery assemblage, the small sized mineral inclusions are present in 26,5 % of the potsherds, the medium-sized in 27 % and the coarse dominate with 46,5 %.

For the analysis of the surface treatment we follow the work of Fidanoski (2009) with some modifications. The pottery is clustered in four groups, or four levels of surface smoothness: rough, roughly smoothed, smooth and polished. The first level is where no attempt for at least minimal effort for smoothing is visible. What is sometimes visible is modeling traces (finger or tool marks) or coil borders. But above all, this category includes the intentionally roughened or barbotine decorated pottery. The second level of smoothness means that minimal effort for smoothing was made, probably using only the fingers. In many cases this effort was not applied equally on the whole surface. The third level is smooth, in places burnished surface. There is no doubt that a smoothing tool was used, since there are occasional fine parallel lines testifying of the smoothing process. Still, there are some bigger vessels with unevenly treated surface. The fourth level is the extremely polished, evenly treated surface which under certain angle reflects the light. This and the previous technique were reserved for the vessels that were intended for slip application or painting. Level I represents 26,5 % of the assemblage, level II with 33,8 % is the most dominant, level III comes second with 28,7 % and only 9,6 % of the pottery is polished.

Slip is an aqueous clay solution, which is applied on the surface of already shaped vessel before firing (Fidanoski 2009, 116). The temporal frames of the use of slip in Macedonian Neolithic are somewhat better defined. Even though many hues were present (red, orange brown, gray), the Early Neolithic is characterized by the domination of the red varieties of slip. The red-slipped vessels with smooth or polished surface were the precondition for the appearance of the white painted ornaments, which is the trademark of the Early Neolithic in Macedonia. The same hues are present throughout the whole Neolithic, but the Middle phase is dominated by the brown and gray hues, and the Late Neolithic by the dark-gray and black slip (Fidanoski 2009).

Exactly one half of the Neolithic pottery assemblage of Grnčarica is slipped. The color is almost exclusively red (there is only one piece with brown slip). The different tones of red and the position where the slip was applied vary. The slip on the vessel can be on: the external surface (location 1); the internal surface (location 2); both surfaces (location 3); the external and horizontal band below the rim on the internal surface (location 4); the internal and thin horizontal band below the rim on the external surface (location 5); the internal surface and the very tip of the lip (location 6); the external surface and the very tip of the lip (location 7); tip of the lip only (location 8). The generated results are presented in Tab. 2.

The firing stage (together with the choice of clay) is reflected on the surface color (of the non-slipped or painted pottery) and the type of profile-section (visible on the fragmented pottery). The Neolithic potter understood surprisingly well (through practical experience and collective memory of course) the chemical and physical features of the different clays and their reaction when exposed to high temperatures. So in order to avoid deformation or other unwanted

	Location 1	Location 2	Location 3	Location 4	Location 5	Location 6	Location 7	Location 8	Total	%
Red	25	27	55	1	3	1	1	3	116	70
Thin red	4	3	9						16	10
Light-red	6		2						8	4,8
Dark-red	3		8		1			2	14	8,4
Orange-red	4	2	4						10	6
Brown-red	1								1	0,6
Brown			1						1	0,6
Total	43	32	79	1	4	1	1	5	166	100
%	**26**	**19**	**47,5**	**0,6**	**2,4**	**0,6**	**0,6**	**3**	**100**	

Tab. 2. Slip types and distribution on the Neolithic pottery from Grnčarica.

appearances, but also to achieve the right color, they were manipulating the clay, the temperature, the oxygen flow and they were consciously choosing the right type of temper.

Observing the pottery assemblage from Grnčarica, we can conclude that intermediate to light hues were required. The statistics are following: light-brown pottery dominates with 31 % and it is equally present in both fine and coarse pottery groups; the brown pottery follows with 21 % and it is also equally distributed; red- brown colored pottery is present with 15, 7 % and it is slightly more present in the coarse pottery; the darker hues come in fourth starting with grayish-brown, represented in 11,5 %, equally distributed; the pottery with yellowish-red color is present in 6,5 %, equally distributed among the groups; a very dark version of brown follows with 5,7 % and is also equally distributed; brownish-red pottery comes in 4 %; the plain red pottery is only 2,5 % of the assemblage and it is more affiliated with the fine pottery group; there are three pieces of dark-gray pottery which are probably parts of the same vessel, and their obvious difference with the rest of the assemblage suggests that they might be imports from other site or culture.

In general, there are two types of profile-sections in the Neolithic: profile section with the same color as the surface of the pottery, and the 'biscuit' type (Чохаджиев 2007; Fidanoski 2009). The first type is present when the pottery is fired on constant, continuous and sufficiently high temperatures. This type of profile section is completely absent in the Neolithic pottery from Grnčarica. The second type is when a layer with gray or black color is visible between two layers with the surface color of the pottery (Fig. 3). Where this type is present, it means that the pottery was fired either on a temperature lower than the optimal, or for a time shorter than necessary. The second probably is the case for the Grnčarica assemblage. The fuel department in the discovered kiln is not too large. Even though we don't know the covering structure, the height of the internal space of the kiln was not too big either. Whatever fuel was used, it

Fig. 3. The typical profile-section of the Grnčarica pottery.

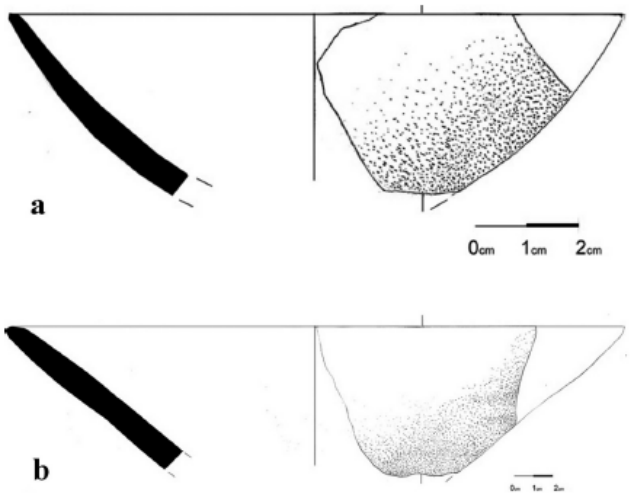


Fig. 4. Plate typology.

would burn relatively quick together with the cover, which would lead to a sudden oxygen increase and temperature decrease. This would explain the variety of dark tone layers, which are abundant in the profile-section of the pottery from Grnčarica and exist even in the finest potsherds. This would explain also the existence of different hues on one vessel, depending on its position inside the kiln during firing. Nevertheless, all these claims should be taken only as possible hypothesis until experimental archaeology reject or confirm them.

Shape typology

Due to the extremely fragmented state of the pottery, only 13 vessels could be reconstructed and they are representing the category of reconstructed vessels. This is the category that unambiguously gives us full profile of the vessel and allows typological classification. Many of the fragments contain some elements of the profile, so they also contribute to this classification.

There is no unified criteria system and nomenclature for the typological analyses of the archeological pottery from the Balkan Neolithic. The current state is rather confusing and difficult to make comparisons. There is a variety of classifications, which differ almost from site to site (Gardner 1976; Китаноски *et al.* 1978; Симоска *et al.* 1979; Garašanin 1979; Симоска *et al.* 1983; Mock 1976; Симоска *et al.* 1987; Чохаджиев 2007; Ганецовски 2009; Fidanoski 2009; Гарашанин/Гарашанин 2009; Angeleski 2011). The light side of this situation is that most of the type names are descriptive, or there is a short morphological description of the type. Trying to fit an assemblage precisely in the jigsaw requires previous careful comparative analyses to the existing works. Here we mainly follow the typology used by Fidanoski in their synthesis of the Neolithic period in Macedonia (Naumov *et al.* 2009). Out of the 332 members of our assemblage, 189 give information about the shape of the vessel they once belonged to. From the variety of the Neolithic pottery shapes from Macedonia and the Balkan, there are only five types found in Grnčarica: plate, bowl, jar, lid and flat-base (or pan).

Plates

Plates are defined as open vessels, whose largest diameter is the rim diameter (Fig. 4). In Grnčarica there is only a couple of reconstructed examples but, from analyses of other assemblages, as a general criteria is considered that the vessel height should be equal or smaller than one half of the rim diameter, and the foot diameter is less than ⅔ of the rim diameter (Fidanoski 2009).

Plates represent 47,6 % (90 examples) of the mentioned 189 potsherds. Taking almost one half of the assemblage, they are the dominant shape in the pottery vessel shape. Further observations bring out some internal differences among the samples from the plates group. The wide range of their practical use defines the wide variety of profile, wall thickness, surface treatment or decoration. Fifty-one of the plate examples (56,6 %) belong to the group of coarse pottery. The remaining 43,3 % (or 39 pieces) are fine pottery. Observing the surface treatment and presence/absence

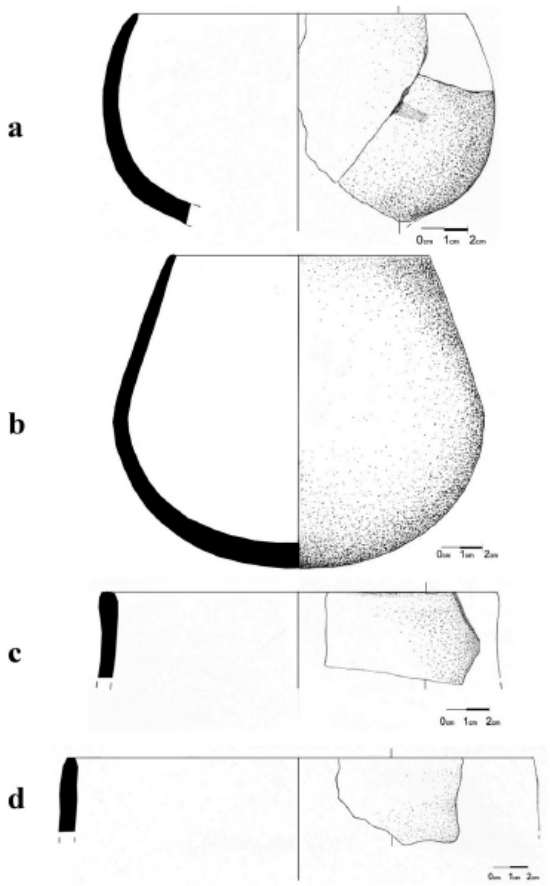


Fig. 5. Bowl typology.

of slip, shows no patterns. All levels of surface treatment and all variations of slip application are present. Presenting the percentage would be statistical numbers without meaning. But the variations of the profile could give interesting and useful information, which can be used for further relative dating and synchronization with other assemblages. On the basis of the profile variations, two types can be recognized:

Hemispherical plates – the line of the wall in the profile section is curved line (Fig. 4a); this type of plates slightly outnumbers the second type.

Conical plates – the line of the wall in the profile section is straight line (Fig. 4b).

With finer morphometric measurements we can observe further subdivisions, but given the space limitations for this presentation, we will leave them for some future direct comparative study of assemblages in the region.

Bowls

They are considered as open vessels. The rim diameter is smaller than their biggest diameter, but never less than ⅔ of it. This criterion is especially useful when determining the shape of a vessel that stands on the border between bowl and jar. In Grnčarica forty-six bowls (24,3 %) were recognized. Seven of them are reconstructed vessels and the rest are recognized mostly from rim fragments (Fig. 5).

Bowls are considered as the finest pottery in an assemblage, 'the highest achievement of the Neolithic potters in Macedonia' (Fidanoski 2009, 122). This is generally confirmed by the Grnčarica assemblage: only ten examples (21,7 %) belong to the coarse pottery group; the fine dominates with thirty-six examples (78,3 %); the examples with smooth surface are fifteen, followed by thirteen polished pieces, then twelve roughly smoothed and six rough;

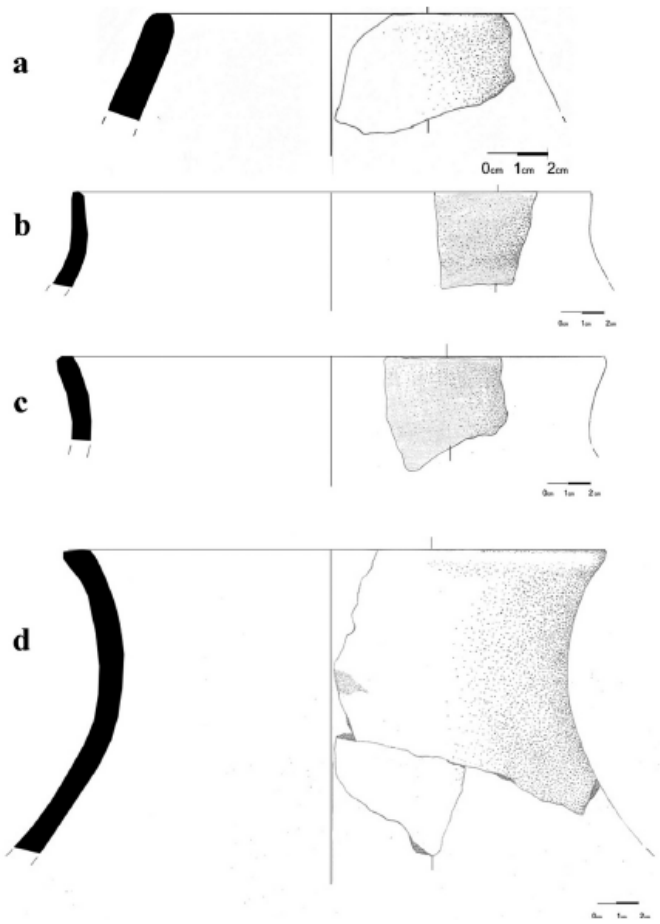


Fig. 6. Jar typology.

thirty-one of this pottery type pieces (67,4 %) are slipped; there are only two decorated examples: one is the only white-painted potsherd in the whole assemblage (Fig. 13a) and the other one has some very fine barbotine-like intentional roughing of the external surface below the rim; this type of vessels have mostly flat bottoms, but there are also examples with convex bottoms (Fig.5b) or they stand on small (usually four) ellipsoid legs; there are examples with small, medium and very large mineral temper in the clay and the organic inclusions are always present; further typological subdivision can be made on the basis of the form of the body of the bowls:

Hemispherical bowls – this type of bowls represent part of a sphere; some are more flattened than other, but the common denominator is the curved line of their walls when looked at cross-section (Fig. 5a); in most of the cases the lip of this type of bowls is even, but there are examples with slight thinning or widening of the lip.

Bowls with hemispherical lower and conical upper part – the name of the type is descriptive enough; it can only be added that there is no carination dividing the two halves (Fig. 5b).

Bowls with outwardly drawn lip (Fig. 5c).

Cylindrical bowls (Fig. 5d) – there is only one example in this group, whose walls are vertical; it belongs to the fine pottery group, but its walls are not even; the fragment is small and we do not know the shape of the lower half, but from this piece only we can tell that at least the upper half was cylindrical.

Jars

Vessels with constricted recipients (closed vessels). The usual body shape is spherical (the term globular is used especially frequent in the literature), and very often they have relatively tall neck (Fig. 6). The total height of the

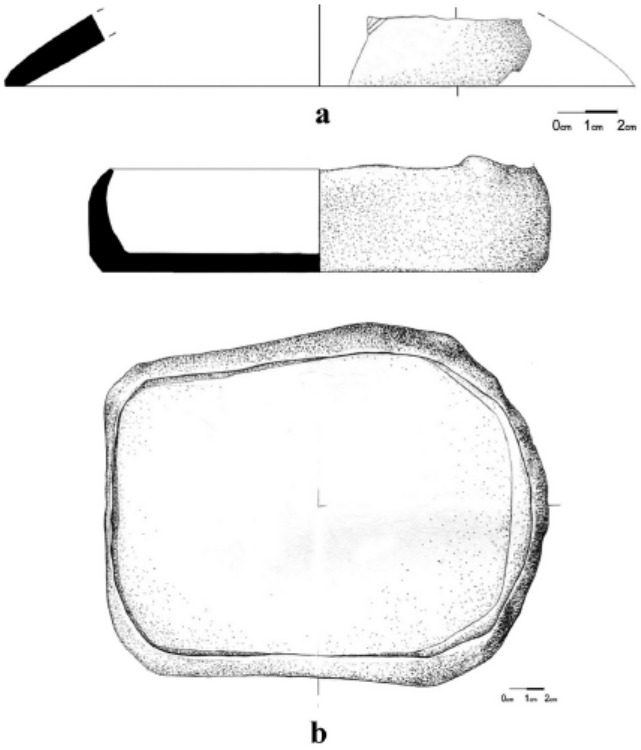


Fig. 7. Lid and flat-base.

jars and their rim diameter never exceed than ⅔ of the vessels biggest diameter. The transformation of the jars characterizing the passage of the Early towards the Late Neolithic consists of a decrease and heigth and an increase of width (Fidanoski 2009, 126).

In Grnčarica, jars slightly outnumber the bowls. The number of examples is forty-nine, which makes 25,9 %. Twenty-five of them (51 %) are coarse, and twenty-four (49 %) are fine. All temper types are present. Twenty-six (53 %) are slipped. The majority has roughly smoothed surface (twenty examples – 40,8 %). Seventeen pieces (34,7%) are smooth, ten (20,4%) are rough and only two representatives (4%) have polished surface. Here, same as in the case with the bowls, most of the examples were determined from rim/wall potsherds. Nevertheless, from what is preserved, a profile typology can be produced: Jars with constricted opening (Fig. 6a) – the neck or the rim are not pronounced; the line of the wall continues from the belly towards closing the vessel, and ends without direction or thickness modification (hole-mouth jar is a term often used); these are the examples difficult to distinguish from the bowls, without applying metrical criteria. Jars with vertically drawn rim (Fig. 6b) – the rim derives directly from the belly of the vessel, it is drawn vertically and is relatively short; no other morphological element can be detected between the rim and the belly; this type should be considered more as a tendency, or transitional type towards the next one. Jars with short neck and outward rim (Fig. 6c) – from what we can see from the potsherd examples, the neck in this category can be defined only as the breaking point between the inward wall of the belly and the outward rim.

Jars with long neck and outward rim (Fig. 6d) – this group is similar to the previous, but here the neck is elongated parabolic transition from the belly to the rim; they are relatively large storage vessels, probably among the largest utilities in the household; unfortunately, the lower part of the vessel was not preserved.

Lids

Lids are expected to be common element in the Neolithic household activities. But their similarity with the plates makes them difficult to distinguish and surely diminishes their real number. In Grnčarica, only one fragment could be determined as part of a lid with certainty, and that is because of the minimal remains of an incised decoration it had on the external

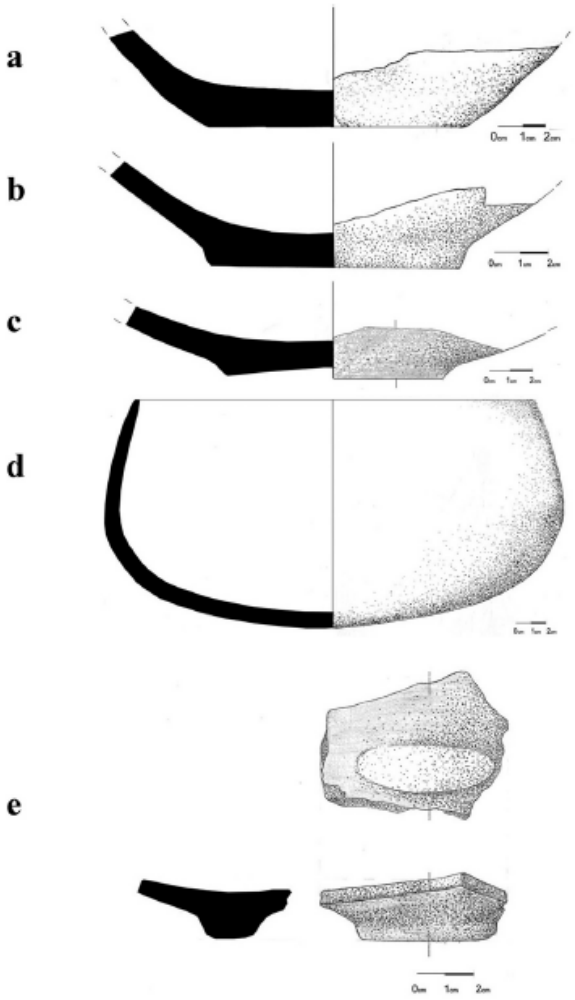


Fig. 8. Base typology.

surface (Fig. 7a). Only few parallel lines from the supposed incised ornament are visible, but nevertheless it is enough to make it more logical to conclude that it was once a conical lid. The potsherd belongs to the group of coarse pottery. There are organic and some middle-sized mineral inclusions in the clay. The surface is roughly smoothed and has the natural post-firing color of the clay, which in this case is brown.

Flat-bases

Also called pans, are lumps of clay, which are spread and roughly shaped into flat platform with low irregular walls. Not much attention is paid to the other technological stages also (paste, surface treatment or firing). No slipped or decorated examples are known from Macedonia so far. In fact, there are published examples only from the Late Neolithic Anzabegovo-Vršnik culture (Fidanoski 2009, 134).

In Grnčarica three different flat-base examples were discovered. The first had enough elements to be reconstructed (Fig. 7b). It is a shallow vessel with irregular shape and a lot of inclusions in the clay, both organic and mineral in all sizes. The bottom is flat and thick, the wall thickness varies, and the rim is slimmed and drawn inwards. The post-firing color of the clay is not even, which means it was fired in unstable and low temperature conditions. There are also traces of secondary firing. It stood probably very near the fire place and had kitchen functions. The second example is a gray-colored bottom fragment from a vessel that apparently had rectangular shape. On its lower side basketry imprints are visible. The third example is a rim fragment from a vessel which was also rectangular and obviously shallow. It has similar color and appearance as the first one. Some of the pottery fragments do not carry information about the shape of the vessel they belonged to, but they can be used to establish the different varieties of handles and bases of our pottery assemblage.

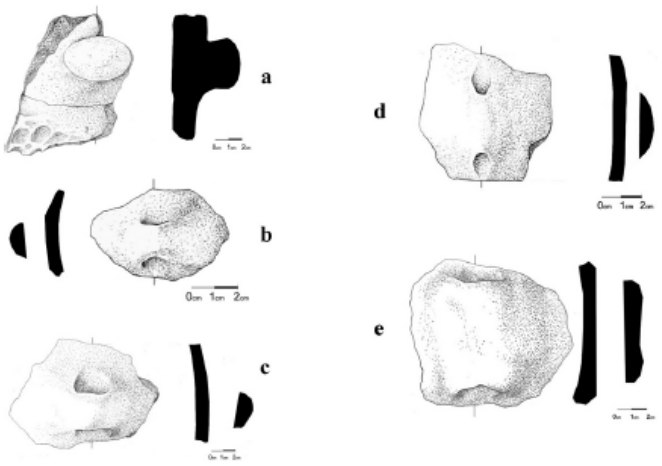


Fig. 9. Handle typology.

Base typology

The base is the thickest and strongest part of the vessel. As a result they are usually the best preserved morphological element. Unfortunately, very often it is the only preserved part, making it difficult to associate certain base type with vessels. This is exactly the case with the Grnčarica assemblage. There are seventy-six unearthed bases and base parts, isolated from the rest of the vessel. The best that can be done is base typology:

Flat base (Fig. 8a) – this is the most common type of base in the assemblage; it is represented by thirty-four out of the seventy-six examples (44,7 %); the belly of the vessel starts directly from the edge of the bottom.

Flat cylinder foot (Fig. 8b) – here the belly starts from a slightly higher point, which gives the impression that the vessel is standing on a flat cylinder with various height; this type comes in close second with 43,4 % (thirty-three examples).

Concave base (Fig. 8c) – there are only two examples discovered.

Convex base (Fig. 8d, 5b) – this type is known only from two reconstructed bowls.

Legs (Fig. 8e) – there are fragments from four different vessels; this type of vessels stands on several (usually four) small legs; the examples from Grnčarica are with ellipse horizontal cross-section.

Ring foot – even though this type is reported as dominant in sites not so far (chronologically and geographically) from Grnčarica (Чохаджиев 2007), here there is only one example of ring foot (no representation available).

Handle typology

Handles (like bases) are strong (thick) parts of the vessel which very often, especially in cases of strong fragmentation of the pottery, are found out of morphological context. In Grnčarica fifty-eight handle examples are identified (reconstructed vessels, where four handles of the same type are together, are counted as single example). Similar as in other Early Neolithic contexts (Krauß 2011b), the typology is very simple:

Lugs with perforation (Fig. 9b,c) – this type of handles are represented by thirty-one example (53,4 %); they can be found in both, jars and bowls; usually they are four in one vessel, positioned symmetrically on its four sides; the perforation can be horizontal, or more frequently vertical, but it is very often that the vertical lugs are slightly tilted to the left or right from the vertical axis; this tilting is probably connected to the practical use and the direction of the ropes that were strung through them.

Vertically perforated tunnel-shaped handles (Fig. 9d,e) – together with the lugs, this is the most frequent type from the Early Neolithic in the wider area; In Grnčarica they are represented by twenty-six examples (44,8 %); they can also be found in both jars and bowls and their position on the vessel is the same as the lugs; the difference is that the tunnel-shaped handles are more elongated and the perforation is always vertical; their function is also connected with cords or ropes for easier transportation and handling of the vessel.

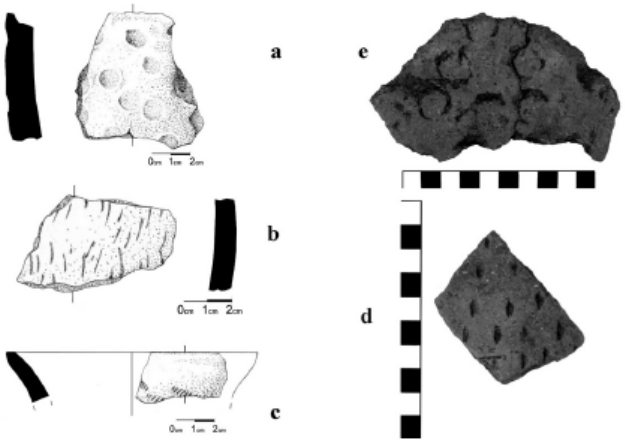


Fig. 10. Different modes of decoration by impression.

Knob (Fig. 9a) – there is only one ellipse-shaped knob handle in Grnčarica; it was positioned on the neck area of a large jar, which was also decorated with finger imprints on the body.

Decoration typology

Potters from the Neolithic in Macedonia decorated their products using eight different techniques: barbotine, application, painting, impression, stabbing, incision, incrustation, and channelling (Garašanin 1979; Темелкоски/Миткоски 2005; Гарашанин/Гарашанин 2009; Fidanoski 2009). Their significance in different cultural groups and chronological periods vary. In Grnčarica, out of the 332 Neolithic pottery artefacts, only 50 are decorated. That means that undecorated monochrome (slipped or not), with 85 % dominate the assemblage. In those 15 % (50 examples), not all mentioned decoration techniques are represented. From those that are present, the different modes of impression and the barbotine technique are the most frequent, leaving far behind the different application, incision, stabbing or painting techniques, which are represented only by few examples.

Impression

This technique can be performed with tool or using only the hands; the goal is to leave marks on the vessel surface prior to firing (Fig. 10). Unfortunately, although it is the most frequent technique in the assemblage (18 examples, 36 %), it is not chronologically sensitive. It is found throughout all the phases of the Neolithic (usually on coarse pottery). There are five different ways in which this technique can be performed: fingertip impressions, fingernail impressions, 'o' impressions, cord impressions and 'grain' impressions:

Fingertips leave relatively regular circle marks on the vessel surface; represented by ten examples, forming rows of circles with the fingers was one of the most common ways to decorate a vessel in Grnčarica (Fig. 10a).

Another way of decorating a vessel without a tool was using the fingernails (Fig. 10b); they are represented with five examples. One example shows circular impressions that are obviously made with tool (Fig. 10e); Čohadžiev (Чохаджиев 2007) proposed that these impressions were made with hollow bone instrument.

Another common impression pattern for the Balkan Neolithic is the 'grain' impression (Fig. 10d); it is performed with sharp tool; in Grnčarica however, it is represented by only one example.

The last example is a jar fragment which was imported, or more probable it is an intrusion from some later site; the overall appearance of the pottery does not fit the assemblage; the decoration also is not found in any Neolithic context in the wider region – small, ellipse impressions, made by a cord-wrapped tool on the exterior of the neck (Fig. 10c).

Barbotine

This is one of the positive decoration techniques. In order to perform the decoration, once the vessel is shaped (but before firing), an uneven layer of clay is applied on its surface (usually on the lower exterior half). This clay mass was probably in a more liquid state. Depending on whether it was modified or it was left unchanged after the application,

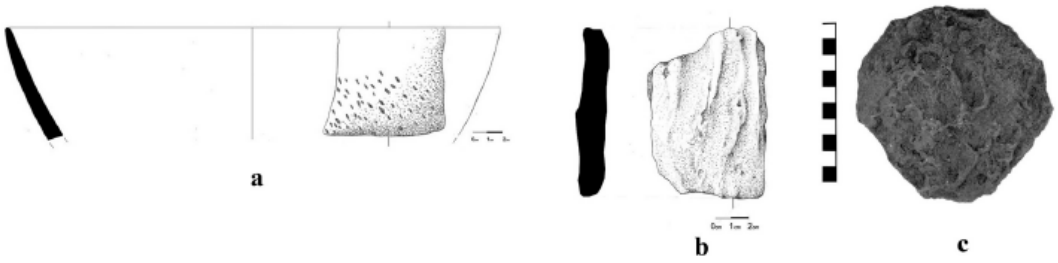


Fig. 11. Decoration by stabbing and different barbotine modes.

Fig. 12. Varieties of decoration by relief applications.

two different types exist: organized and unorganized. This type of decoration is present in all of the Neolithic phases in the Balkans. There are seventeen examples (34 %) in the Grnčarica assemblage.

Unorganized barbotine – the additional layer of clay was applied freely, maybe by sprinkling the mushy clay with some kind of brush; a minimal 'spreading' intervention is possible in some cases; once the desired appearance was achieved, the pot was fired without further modification (Fig. 11c); twelve examples were found in Grnčarica.

Organized barbotine – after the additional clay mass was applied, using the fingers, vertical grooves were made from the bottom to the neck, giving a wavy appearance of the external surface (Fig. 11b); depending on how the grooves finish at the neck area, a subdivision called 'arched barbotine' had been determined (Garašanin 1979); in Grnčarica the examples are too few (only five) and too small to permit such observations.

Application

This is another positive decoration technique, where previously shaped clay mass is applied on the vessel surface prior to firing. Although only five examples have this kind of decoration, four different types are noted. They differ in the shape and the context of the application:

Small balls in tight rows – the applied balls are with 1,2 centimeters diameter and they are grouped in regular rows, tightly one next to the other (Fig. 12b); from the two fragments that were discovered in Grnčarica, the ball rows are all there is, so there is no way of knowing on which part of the vessel, or which type of vessel they were applied on.

Nipples – this is a unique fragment with two nipples positioned vertically next to each other (Fig. 12d); the example is grayish-brown coarse potsherd, probably from a bowl body.

Horizontal relief rib – as the name describes, a clay band was horizontally attached to the body of the vessel; the preserved example is only one and very small (Fig. 12c).

Arched relief band – another unique small fragment from the assemblage has an arched clay band applied on it, with couple of finger impressions (Fig. 12a); apparently this arch was part of a bigger ornament, but this small potsherd is the only puzzle piece that was discovered.

Incision

Incision, as decoration technique in the Neolithic period, was performed with a sharp tool. In Macedonia is extremely rare, but still it is associated with all phases. There are only two incised potsherds in the assemblage: one is the mentioned lid (Fig. 7a) and the other is a plate fragment, where the incisions are shallow and barely visible.

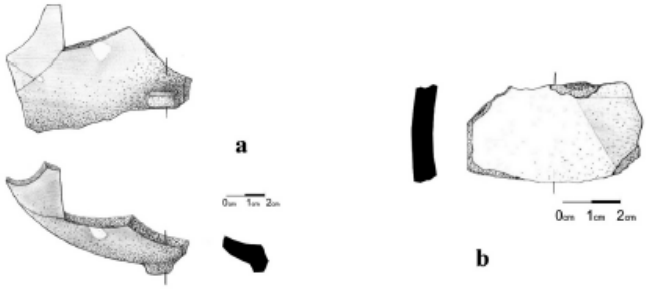


Fig. 13. White-on-red and red-on-light painted pottery fragments.

Stabbing

There is only one plate fragment, decorated with stabbings by a pointed instrument (Fig. 11a). The decoration is performed on the lower part of the exterior surface.

Paint

The only white painted bowl fragment should be mentioned as well. Obviously the ornament was more complex than what is preserved, and it was performed with white color on a polished red-slipped background (Fig. 13a). This is the characteristic type of decoration for the 'post-monochrome' Early Neolithic of the Balkan Peninsula. But having only one fragment, do not permit a confident chronological determination of the whole assemblage.

Another body fragment, although questionable, should be mentioned here. It seems that the normal red slip in this case was applied in order to create an ornament (Fig. 13b). This is not the usual way how paint was applied, even for the later 'dark paint' phase. It is possible to be the result of post-depositional alteration and uneven slip preservation.

General consideration about the Grnčarica pottery

The most general attributes of the pottery from Grnčarica would be: 'primitive' appearance, uneven walls, abundance of mineral and organic temper, low firing temperatures and lots of red slip. But there is also a significant number of very fine and polished pieces. The highly fragmented state of the pottery further undermines the already difficult task of finding parallels in other sites from anywhere on the Peninsula. There is also the mentioned issue with the non-unified criteria system for typology. Even though many fragments gave some information about the vessel shape, most of the information is limited to only one morphological part. In addition, the lack of previous interdisciplinary chemo-physical analyses of the clay fabric does not allow some very important technological characteristics to be observed. However, from the presented observations some general conclusions about the Neolithic pottery assemblage from Grnčarica can be summarized:

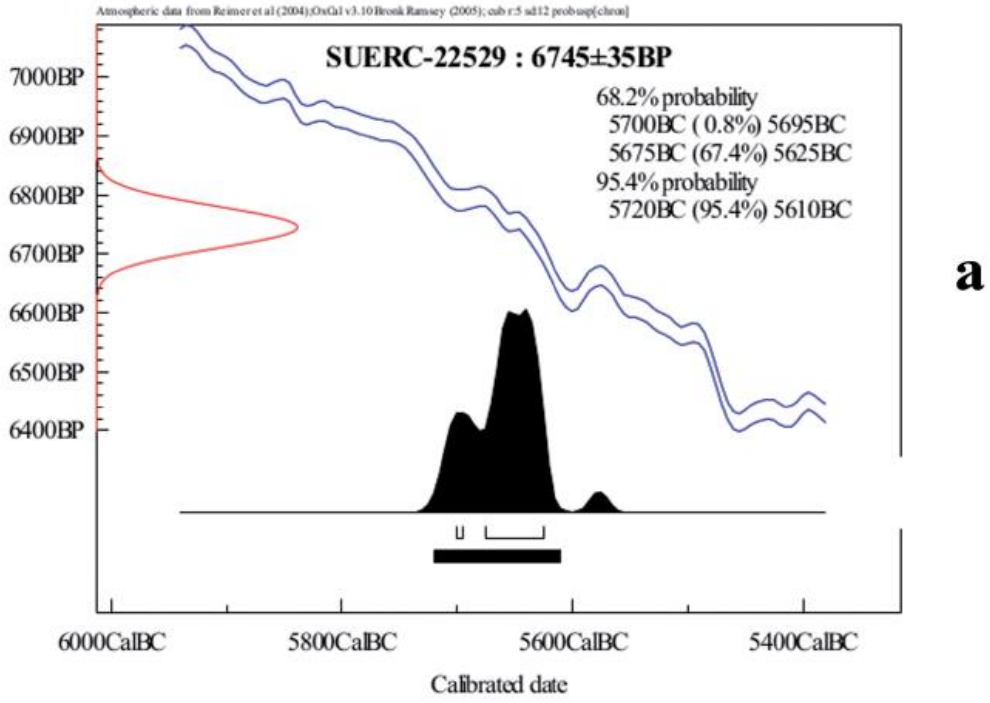
There is an equal distribution of coarse and fine pottery.

The organic and mineral inclusions in the clay are present in almost all potsherds.

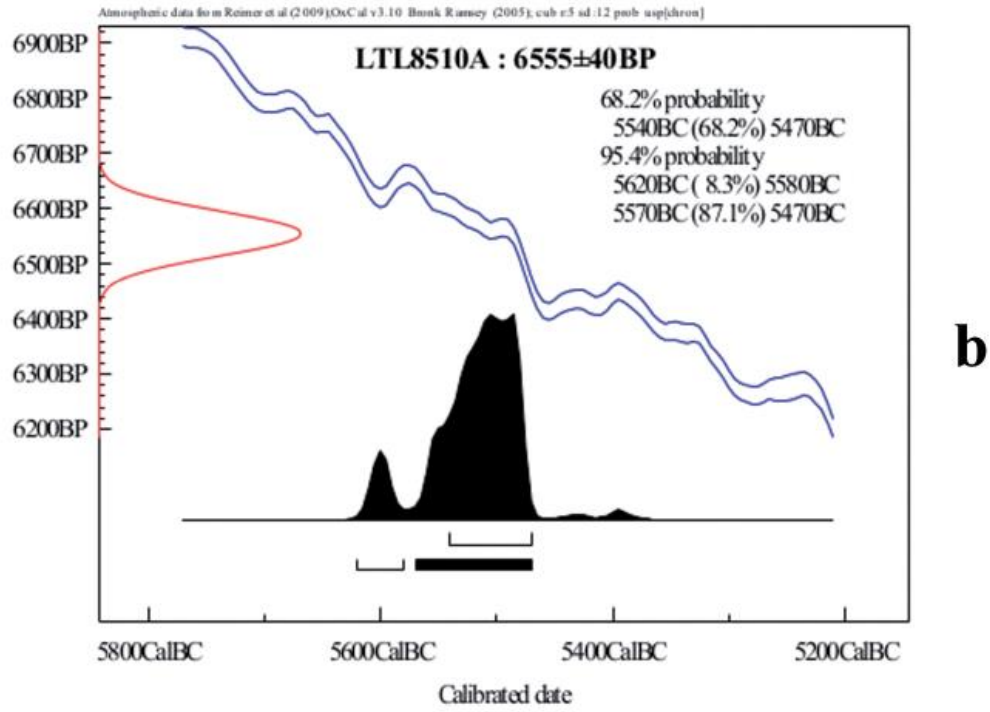
The surface of the vessel was only roughly smoothed in most of the examples, and together with those with smooth surface, they dominate the assemblage, leaving far behind the two extreme levels: rough and polished.

The use of slip was highly fashioned, so half of the assemblage is slipped. The range of variety is wide; on one hand, the variety of color of the slip can be accidental, resulting from mixture modification, different firing conditions or post-depositional alterations; on the other hand, the choice of which area of the body of the vessel to be slipped is intentional and according to the potters or customers aesthetic perceptions.

The post-firing surface color of the non-slipped pottery is hardly a criteria for cultural or chronological determination of an assemblage, especially Neolithic; it can give information about the firing conditions and temperature, but the intra-site variations are so many that on the basis on the color alone, sometimes even fragments of the same vessel can not be recognised as related (especially when determinations of the color are subjective descriptions); the cross-section type is somewhat more reliable, but the possible variations are too little and therefore not much informative; if a type of cross-section is typical for two assemblages, that not necessarily makes them culturally and chronologically connected; firing conditions are not something that gradually and irreversibly transform in time from one setting to another; again, the biggest contribution of this kind of information would be only for better understanding of the life inside that particular settlement.



a



b

Fig. 14. Calibration plots of the two dated samples.

The shape and decoration typology is the best indicator for making inter-site analogies and it has been, and should be used intensively when studying Neolithic cultures and their development.

Discussion

The focus in this study so far was on the pottery assemblage from Grnčarica, a Neolithic site from Central Eastern Republic of Macedonia. But the questions that arise from these pottery analyses, concerning the wider picture of the Balkan Neolithic will be discussed in this section of the paper. So far, we have seen a settlement with pottery profile that seems to fit within the "monochrome" phase pottery assemblages from throughout the Balkan Peninsula (Nikolova 2007); but a site that contained also a human burial, dated (with AMS ^{14}C by two different laboratories) five or six centuries after an assumed "monochrome" phase of the Neolithic.

The debate on the pottery-based relative chronology of the Neolithic period in the Balkan Peninsula has been going on since the first attempts to establish it, and today the open issues are more than ever (Heurtley 1939; Mock 1976; Gardner 1976; Китаноски *et al.* 1978; Garašanin 1979; Симоска *et al.* 1983; Симоска *et al.* 1987; Tchohadjiev/Bakamska 1990; Тодорова/Вайсов 1993; Чохаджиев 2007; Гарашанин/Гарашанин 2009). This debate is inevitably correlated with the 'neolithisation' discussions (Perlès 2001; Kotsakis 2001; Bonsall *et al.* 2002; Nikolova 2007; Krauß 2011a; Özdoğan 2011). The main questions in the middle of the discussions are about: the exact time when the Neolithic started in the peninsula, the mode and directions of neolithisation and the appearance and distribution of the earliest pottery. Relevant to all of them is the Balkan 'monochrome pottery' issue and the associated 'Proto-Starčevo' phase (Srejović 1971). One group of researchers see the monochrome phase as initial phase in the Neolithic development, preceding the 'developed' Neolithic with white painted pottery (Nikolova 2007). The opposing group usually doubts the methodology during the excavations of the sites reported to contain 'monochrome' phase and add that 'pottery first arrived in southeastern Europe at a time when the phase of monochrome pottery in the southwestern Anatolian Lake District had already ended' (Krauß 2011a). Nevertheless, since the introduction of the phase by Srejović in 1971, many sites from all over the Balkan were attributed: Krajnici, Koprivec and Poljanica-platoto from Bulgaria (Tchohadjiev/Bakamska 1990; Тодорова/Вайсов 1993; Попов 1996) and Divostin, Donja Branjevina, and Grivac from Serbia (Karmanski 1979; Богданович 1987; Bogdanovich 2007). In Macedonia (even if it was not labeled 'monochrome'), an assemblage devoid of painted pottery was reported in Pešterica (Симоска *et al.* 1983) . It resembles strongly the material culture, and especially the architectural and outdoor activity features of Divostin and Ohoden. This report has not received the proper attention and since then the established Neolithic system of Macedonia was not challenged seriously.

Grnčarica and Pešterica share many similarities. They are both flat settlements, positioned on slopes on valleys periphery. The life of the settlements, compared to the tell settlements, was short. The buildings were not renewed after their first (and last) destruction. The architectural concepts are completely different, but that can also be a local adjustment and environmentally conditioned, as much as a cultural trait. When added to this the great similarity of the pottery, especially from technological aspect, the affiliation of these two sites from Macedonia seems straightforward. Kitanoski in the excavation report interpreted the site as an eponym of a 'new Neolithic group from the earliest phases of the Neolithic, settled in the wet Atlantic phases when the nearby Pelagonia valley was under water' (Симоска *et al.* 1983). It is already clear that all material culture characteristics point towards attributing Grnčarica to the still amorphous chronological group of sites with monochrome pottery (Initial Neolithic). But the radiocarbon results (Fig. 14) disagree. Even though the two results do not match, both are far from the proposed chronology for the Balkan Neolithic monochrome phase (before 6100 cal BC; for detailed Neolithic chronology see Naumov *et al.* 2009).

In Krajnici (Western Bulgaria) the monochrome layer I (which shares many pottery traits with Grnčarica) is at the bottom of the stratigraphy, superimposed by two layers (II and III) containing pottery with white-painted decoration (Чохаджиев *et al.* 2007). Thus, the relative chronology here seems clear. Radiocarbon dated samples from future excavations would be of great significance in completing the regional picture.

Ohoden is another settlement from Bulgaria which, besides some differences, finds many analogies with Grnčarica. This site was dated at 5710±40 cal BC (Ганецовски 2009). The dates match the dates from Grnčarica, which gives further support to the credibility to the radiocarbon results.

If we accept that Grnčarica represents the prototype of agricultural societies in the region (to which the material culture points), then we need to explain the absolute dating results. Since there is no vertical stratigraphy detected during the excavations, future systematic campaigns might search for horizontally stratified settlement complex. The difference in thickness of the cultural layers in the northern and the central part of the excavation area, and the sedimentation processes on the slope should be explored in more details. Various samples of different nature and from different contexts should give firmer ground for establishing absolute chronology frame of the site.

If we accept the dates, then we have a lot of explanation to do. According to the established chronology, Grnčarica would belong to Anzabegovo-Vršnik II (but we should have in mind that the radiocarbon dates of the different stages of the established Anzabegovo-Vršnik culture largely overlap; Linick 1977), which is the beginning of the Middle Neolithic in Macedonia. The most characteristic features of the Middle Neolithic (dark-painted ornaments on pottery, channeling, shapes with carination, and vessels with high hollow foot), in Grnčarica lack completely. In fact, there is no single element in the entire material culture that would suggest Middle Neolithic. Even if we rely on a single white-painted fragment (0,03 % of the pottery assemblage), we would still expect earlier dates. White paint is still present in pottery during the Middle Neolithic, but in comparison to the aforementioned characteristics it is a mere exception. So, finding the exception in the assemblage and not finding even one piece of the prevailing group is quite a coincidence.

The generalized representation of facts in publications so far, prevents more subtle detection of individual traits and differences. Still, some of the differences had already been presented. When talking about Rug Bair I (another site from Eastern Macedonia), Garašanin (Гарашанин/Гарашанин 2009) is attributing it to the Anzabegovo-Vršnik II phase, but notes that the pottery assemblage is dominated by coarse ware and barbotine decoration. In Vršnik I (which is one of the eponym sites) the assemblage is distinguished by the abundance of coarse ware and impresso decoration. In the Skopje region the Anzabegovo-Vršnik II-III Middle Neolithic sites also display strong individual characteristics. Another interesting question, which deserves a separate discussion, is weather this variety is a result of differences developed in time, or a local Mesolithic communities (so far archaeologically invisible) had some influence. It seems that the general picture of the cultures is exactly that – general picture of a region with prevailing common cultural features, but region in which individual small communities also tend to maintain their cultural differences. This should not be seen as a reason for dividing the culture, but to enrich and unite even more the archeological record of the small tribes, scattered around the plains and hill—sides of Central, Eastern and Northern Macedonia into single Neolithic culture. Somewhere in that puzzle Grnčarica fits very well. Our task is to find the exact empty space.

Conclusion

What seemed to be a straightforward Monochrome phase Early Neolithic pottery assemblage was challenged by the radiometric dating results. Until more extensive and more accurate excavations, and further series of ^{14}C AMS dating, we can only present the possible explanations and interpretations of the gathered data.

Rejecting the Radiometric Dates

In this case, we have the first Monochrome Phase Early Neolithic settlement from the territory of the Republic of Macedonia. This would be the earliest known so far Neolithic site from the contemporary borders, preceding the Anzabegovo – Vršnik Ia and corresponding to an ambiguous group of settlements, scattered throughout the temperate zone of the Balkan Peninsula, united under the cumulative term "Monochrome phase".

Accepting the Radiometric Dates and Rejecting the Established Neolithic Relative Chronology

Challenging any establishment requires a lot of explanations; and accepting Middle Neolithic dates without having the accepted Middle Neolithic traits in the pottery assemblage, from where we stand today, can only be addressed through few possible, theoretical interpretations.

The Transitional Stage of Cultural Development

Different from the previous, mutually exclusive stands, a third inclusive point of view is possible. This requires accepting a small gap in the pottery development between Anzabegovo – Vršnik I and Anzabegovo – Vršnik II, which can be filled with Grnčarica. In other words, the Grnčarica pottery assemblage would represents the process of transformation of the Early Neolithic pottery into the typical Middle Neolithic shapes, without representing either of them. This would suggest a relatively long period of transformation, long enough for the most explicit Early Neolithic pottery traits to be lost, and the Middle Neolithic ones not to be crystallized yet. The obtained ^{14}C dates would fit perfectly for such a transitional phase between the Early and the Middle Neolithic. This is a view worthy for further "higher-resolution" pottery investigations on the entire Anzabegovo – Vršnik territory.

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