STARČEVO-CRIS CULTURE IN MOLDOVA. STATISTICAL-MATHEMATICAL ANALYSIS ON CERAMICS

Abstract

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Over time, there have been numerous references to the evolution of the Starčevo-Criş culture in Moldova, but an analytical synthesis study using the new methods offered by computer science and mathematics was lacking. Through this doctoral thesis we are trying to solve this particular problem.

The main objective of our approach was to verify the evolution of the Neolithic period in Moldova, by analyzing as many ceramic materials as possible, from this historical region, to be entered in the Early Neolithic Database. This database was designed by Prof. Gheorghe Lazarovici and continued by masters and his doctoral students and successfully applied today by more and more specialists in this field.

The second purpose was to analyze the ceramic materials from Moldova and from the whole area of this cultural complex, of which the Starčevo-Criș culture is a part, in order to establish the beginning of the Early Neolithic in Moldova. Over time, before our research several theories were issued on the beginnings of Starčevo-Criș culture in Moldova, at the level of Starčevo-Criș IIIA, IIIA-IIIB or IIIB.

Prior to the present research, in the database were introduced few ceramic materials from Moldova, from the excavations from Poienești-"Valea Caselor", Vaslui county, approximately 533 objects (only from house L4), selective materials from the site from Trestiana, Vaslui county, as well as pottery with paintings from other resorts such as Suceava-"Parcul Cetății", Suceava county, 5 records, Perieni-"Râpa Roșcanilor", Vaslui county, 13 records, Balș-"Valea Părului", Iași county, 3 records.

Most of the records for materials were discovered in Moldova and these were included in our study. We managed to analyze the ceramic materials from the Trestiana site (approximately

5.500 records), most of them from clear stratigraphic situation. From the settlement from Balș- "Valea Părului", Iași county, I recorded 100 sherds, from Negilești-"Curtea Școlii", Galați county, 74 sherds (I selected only fragments with painted and unpainted decoration), Vermești - "Cetățuie", Bacău County, 47 sherds (a selection of fragments and objects with decoration).

This paper is based mainly on archaeological materials from the excavations carried out by Eugenia Popușoi on the site of the Early Neolithic from Trestiana (formerly Stroe Belloescu) - Trestiana site, over more than 30 years and from the survey carried out by the same author in Balș- „Valea Părului", Iași county.

Our approach was necessary in the attempt to establish the beginning of the Starčevo-Criș culture in Moldova and to correlate the discoveries with contemporary discoveries in the area of Romania and beyond.

Through our research we have added another 5721 new records, so for Moldova we now have about 6236 records, and we believe that we have brought enough evidence for the inclusion of the beginning of the Early Neolithic in Moldova in Starčevo-Cris IIIB (at the current stage of research), date confirmed and the results obtained by analyzing the C14 samples collected from the Trestiana settlement, by Mrs. Magda Lazarovici, from dwellings C/L2 and C/L7.

Although the graphs obtained from statistical-mathematical analysis are more difficult to understand for those who are not yet familiar with this type of data processing, we consider that this method, which is used worldwide to study archaeological contexts and sites, is very useful and facilitates the work of archaeologists.

The statistical processing of materials (multidimensional; with multiple attributes) belonging to the Starčevo-Criș culture of Moldova was performed using the Microsoft Access program for the creation of the Database (table), which was then exported to the Zeus software. The transfer was necessary for management materials and results in the purpose of formulating hypotheses and conclusions about the evolution of the Early Neolithic in Moldova.

The purpose of our doctoral thesis was the analysis trough modern methods of interpretation of archaeological materials, respectively statistical-mathematical analysis of ceramics, which together with the stratigraphy offers a very high accuracy of chronological and cultural classification. These analyzes, based on the chronological and cultural series of comparative stratigraphy that take into account the dynamism of archaeological sites (implied by

main, secondary, seasonal settlements), offer very accurate results, comparable to radiocarbon dating, but finer, although with much more effort.

The most important thing in our endeavor was the introduction of 5721 new data into the Early Neolithic database, which so far contained only 515 records of Starčevo-Criș pottery fragments from Moldova. At the moment, the Early Neolithic Database includes a considerable number of records of such materials in our area, 6236, which we have been able to analyze together with materials from the whole area of the cultural complex of which the Starčevo-Cris culture from this region. Thus, following these new recordings and analyzes, we now have another perspective on the evolution of this culture in Moldova. Of all the historical regions, Moldova was, until the approach in this paper, the least investigated from this point of view compared to Transylvania, Banat or Oltenia.

In Chapter 1 we contributed to the enrichment of several catalogs previously developed by Gheorghe Lazarovici and later completed by other colleagues, as follows: 17 new codes in the catalog with painted decorative patterns; 2 new codes in the catalog with unpainted decoration; 11 new codes in the catalog with the types of applications; 1 new code in the catalog of the typology of cup bases; at the same time we introduced a new catalog for biconical forms, including 28 codes; we also added 3 new codes to the typological catalog for dish rims. All these contributions reflect the characteristics of Starčevo-Criș pottery from Moldova that I captured through my study.

We also proposed a dual system for using the codes from the Lazarovici system and those proposed by Anamaria Tudorie, in order to have a unitary Database and to obtain the most accurate results following the statistical-mathematical analyzes. A unitary system of codes will make the new records meet the older ones, which use other codes and thus be able to be analyzed together. If we do not achieve this unity in codes, code records will be analyzed as a different evolution in culture.

At the end of Chapter 1 we substantiated the need to use databases in the analysis of archaeological contexts and sites, and we presented the Databases for the Early Neolithic in terms of quantity, prior to our research.

In the first part of Chapter 2 we presented the main chronological systems proposed for the Starčevo-Criș culture over time, in which an important place is occupied by the one developed by Gheorghe Lazarovici, and accepted by most researchers for Romania. Subchapter

2.2 lists the types of databases made in Romania and the qualitative analysis of the Starčevo-Criş materials from Moldova registered in the Early Neolithic Database. The last section of this chapter presents the advantages and capabilities of the Zeus suites (developed in Romania by Lucian Tarcea and Gheorghe Lazarovici) and the WinBASP software (developed by the University of Bonn and created by Prof. Dr. Irwin Scollar).

Chapter 3 of our paper approached the history of research on the Starčevo-Criş culture in Moldova since the discovery of the first characteristic materials and until now, where we analyzed the main opinions on the periodization of this culture, concluding with that accepted by most researchers.

At the end of Chapter 3, we selectively described the most important archaeological excavations carried out at the Starčevo-Criş sites in Moldova (which are largely represented by records in the Early Neolithic Database of Moldova). Sometimed we found ourselfs in the impossibility of accessing the original documentation of older excavations (preserved or not in the museum archives). Another difficulty into our research was the desire of colleagues who are still investigating certain sites to capitalize the results of research themselves through extensive publication.

In Chapter 4 we analyzed the situation of archeological sites registered in databases by performing percentage statistical analyzes for the three ceramic categories (considering paste, mixture/degreasers, smoothing/surface treatment, burning, vessel shapes, ornaments), from the of quantitative point of view. In the second part of the same chapter I described all the houses in the settlement of Trestiana, Grivița commune, Vaslui county, because, as I mentioned several times in this paper, it has the clearest stratigraphy and has the largest number of entries in the Database for Moldova. The materials from the G7 complex (probably a household pit) and those without a stratigraphic position (marked in the Database with the name *Strat*) were analyzed at the end of this chapter and indicated the same results as those with a secure stratigraphic position from the Trestiana site.

I preferred to use the plans from the monograph published in 2005 by Eugenia Popușoi, although I identified several issues related to them, for avoiding to create confusion. Studying the Trestiana monograph, we believe that during the research on this site, the author of the excavations failed to outline some features that overlapped others from the first stage of habitation. We believe that at least six dwellings were not observed properly during the

archeological research at the Trestiana site. Unfortunately, I did not find in the archives of the Vasile Pârvan History Museum in Bârlad the original plans and all the site records used to prepare the mentioned monograph, which may have added accuracy in interpreting some features (we refer to those which overlap). Undoubtedly, as more data are published on materials found in various Starčevo-Criş sites in Moldova, such analyzes will provide a broader basis for discussion and interpretation.

In Chapter 5 we analyzed the ceramic fragments from Moldova in correlation with all the records in the Database in order to obtain a more accurate image of the Early Neolithic in the studied area. We can conclude that the results obtained by statistical analysis confirmed the results obtained by those made for other regions from Romania, respectively the inclusion of the beginning of the Starčevo-Criş culture from Moldova in phase Starčevo-Criş IIIB. This aspect is confirmed by the C14 dating. Based on the materials studied directly, those taken from the archaeological literature and analyzed by us, it results that the evolution of this cultural phase in Moldova knows all the subsequent phases SC IIIB, up to SC IVB, having some characteristics of its own, demonstrated by the identification of new decorations and new pot shapes, aspect codified and introduces into the database.

After the statistical-mathematical analysis of the materials from Moldova we can conclude that the Early Neolithic in this region indicates a southern influence (through Muntenia, Bulgaria, Turkish Thrace region) in the third migration, the settlements in the southern part being the main settlements (the result of migration) and not secondary, as is the case of the settlement from Gura Baciului (from Transylvania) from these phases, the result of some diffusions.

In conclusion we learned the method of work and the manner to manage databases in archaeology and this aspect determined us to make the processing of the ceramic fragments for a large batch of objects. In the learning process I understood the importance of using the statistics acuity and the need to use them in the future in researching prehistoric sites.

We also consider that this doctoral thesis makes an important contribution to the study of the early Neolithic culture in Moldova, by using and interpreting analyzes, which shed new light not only on the place and character of settlements in cultural evolution, but also important technological aspects related to the craft of pottery.