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CONTRIBUTIONS TO THE RECONSTRUCTION OF VEGETAL DIET OF CEHĂLUŢ-HAJDÚBAGOS COMMUNITIES[1]

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Keywords: Late Bronze Age, Cehăluţ-Hajdúbagos culture, carbonized seeds, ritual pit, storage pit.
Cuvinte-cheie: Bronz târziu, grupul Cehăluţ-Hajdúbagos, seminţe carbonizate, groapa rituală, groapă de provizii.

Introduction

This study uses an archaeobotanical approach to look at subsistence economy of cultivated plants of Cehalut Hajdubagos communities[2].

Until now very little was know about the agriculture of communities which inhabited the intra-Carpathian Basin in the Late Bronze Age. This paper describes the first results regarding the vegetal diet of Cehăluţ-Hajdúbagos.

Cehăluţ-Hajdúbagos culture formed on a prominent Otomani culture background, but probably with contributions of the Tumulus culture (HGK), Suciu de Sus, the Wietenberg and Piliny cultures. Discoveries belonging to this cultural group are documented in the Upper Tisza Valley (in Romania and Hungary) around the area bounded by the Crasna course to the north respectively the Barcău to the south[3]. Data about settlements are better known, while data on Cehăluţ-Hajdúbagos funeral activity come only from few discoveries. The evolution of the Cehăluţ-Hajdúbagos group is placed approximately between the end of the "Classic Bronze" Ottoman culture and the formation of Gáva culture.[4]

Climate and vegetation during the Late Bronze Age

Based on the palynological data from the specific bibliography for the focussed area we tried to reconstruct the climate and vegetation from the late Bronze Age for the intra-Carpathian area. According to palynological analyses it

[1] The paper is published within the project PN2/R.U./63.2010.
[2] I want to express my acknowledgements to I. Bejinariu, H. Pop and L. Marta for the samples offered for analyzing and for the archaeological information regarding the contexts of their discoveries. Also I express my gratitude to my colleague C. Şuteu who made the pictures included in this paper.
[3] Kovács 1970, p. 27-47; Németi 1978, p. 99-122; Kacsó 1990, p. 41-50; Kacsó 1997, p. 85-110; Bejinariu, Lakó 2000, p. 163-219.
[4] Vulpe 2001, p. 225.

seems that there was a cooler climate for the second half of the 2nd millennium BC when a cooler and wetter climate existed, but more constant than during the previous period of the Subatlantic era. Between 1940-480 cal BP the pollen diagram reveals the following composition of tree species and cereal: *Fagus-Picea-Carpinus-Abies-Poace*[5].

Though cold, climate still favored planting of cereals and legume species suitable for existing environmental conditions.

According to palynological analysis, which revealed the high presence of ruderal species that usually accompany worked plots by human communities, it seems that cultivated fields were extended by deforestation.

For the intra-Carpathian Basin in the chronological segment subject to our attention the flora consisted of trees and shrubs represented by *Juniperus, Fraxinus, Betula, Quercus, Ulmus, Salix, Tilia, Corylus, Fagus, Abies, Juglans, Alnus, Picea, Hedera, Viscum, Sambucus, Vitis, Pinus*[6].

Also in the same analyzed samples the pollen grains spores were represented by species *Poaceea, Cereales, Secale*, and intrusions such as *Plantago lanceolata, Artemisia* etc. Other plants which inhabited the area of the intra-Carpathian Basin were determined as belonging to species *Rosaceae, Ericaceae, Rumex, Ranunculaceae, Rubiaceae, Urticaceae, Canabis* type, *Polygonum* sp, *Caryophilaceae, Fabaceae, Brasicaceae, Cyperaceae, Valerianaceae, Lyliaceae* etc[7].

All the species listed were present in greater or lesser extent, in the palynological samples analyzed.

Cold and wet climates facilitated the extensive spread of beech which formed its own area by pushing the spruce to a more concentrated level. Beech expansion was accompanied by *Abies* sp. which shares the same ecological requirements.

Description of the archaeological sites

Tăşnad-La Sere (Satu Mare County)

Tăşnad City is located in the south-west of Satu Mare County in northwestern Romania on the border with Hungary and Ukraine. The point *La Sere* is located in a lower area near the southwest perimeter of the city Tăşnad (Fig.1).

The site is located on the first terrace of the old stream Cehal (now it has changed its course, in the ‘70 a channel being excavated through site). The old

[5] Bodnariuc *et alii* 2002, p. 1480.
[6] Tantau *et alii* 2006, p. 55.
[7] Tantau *et alii* 2006, p. 56.

course of Cehalului (dry) is located a few hundred meters southeast of the channel.

The carbonized grain sample was collected during the 2009 archaeological campaign from a storage pit named C185 (complex 185). The grains were on the bottom of the pit, and the amount was much higher so just a sample was picked from whole quantity. The pit was located on the edge of the settlement and in its vicinity several other storage pits were discovered[8].

Şimleul Silvaniei-Observator (Sălaj County)

The maximum altitude of *Măgura Şimleului* at the „*Observator*"point is 596 m dominating by its massiveness the north area of Şimleul Silvaniei city[9] (Fig.1).

Its southern slope in the town direction is the most abrupt with inaccessible slopes and some towering headlands which fall forward to the Crasnei course and offered favorable conditions for defensive system planning. These systems were made to keep the access to gorge, carved over time by the waters of the river in soft rock of Măgura, under control.

From the Late Bronze Age especially deep complexes have been investigated, such as pits, and less vestiges of constructions. From these pits, some have a very rich and varied inventory[10].

By its richness and variety of inventory, the nature of simple pit complexes exceed household and can be included among the pits with ritual destination. This is the case of the pit named G27/2010. Its inventory was very rich, composed of vessels and a significant amount of carbonized grain. The seeds were deposited on the bottom of the pit in a consistent layer (thickness of 10 cm) and over this were placed fragments of vessels, many broken in Antiquity. The pit appears slightly cylindrical in section with a diameter of 1.3 m and a depth up to 0,9 m.

Determination and discussion: analysis of found species[11]

The sample picked from the storage pit C 185 (Tăşnad – La Sere) has a weight of 0,722 kg. Two types of species were identified. The larger amount belongs to *Triticum dicoccum* specie (Fig. 2). The other species was identified as belonging to *Hordeum* sp. (Fig. 3)

[8] Informations from L. Marta.
[9] Bejinariu 2006, p. 15-18; Bejinariu 2006a, p. 31-44.
[10] Ciută, Bejinariu 2012.
[11] In determining of plant species very useful was the specific bibliography: *Cereal ID manual* of St. Jacomet (2006), U. Körber-Grohne (1994) and the *Paleoethnobotany* book of Jane Renfrew (1973).

The sample containing the carbonized seeds picked from the ritual pit G 27/2010 (Şimleul Silvaniei- Observator site) has a weight of 0.538 kg. The plant species identified in the sample belong to *Triticum monococcum* (Fig. 4) and *Triticum dicoccum* (Fig. 5). As follows from a general view the largest share belongs to *Triticum dicoccum*.

Einkorn wheat Triticum monococcum: Einkorn is a relatively uniform diploid wheat with characteristic hulled grains and delicate ears and spikelets. Most cultivated einkorn varieties produce one grain per spikelet, hence its name, but varieties with two grains exist as well. It is autumn and spring wheat.

This wheat was one of the founder grain crops of Neolithic agriculture in the Near East and a main component of the early crop assortment in Europe. In the past, einkorn cultivation was much more extensive. Since the Bronze Age, its importance seems gradually to have declined, very likely because of the competition from free-threshing wheats[12].

Einkorn is a small plant, rarely more than 70 cm high, with a relatively low yield, but it can survive on poor soils where other wheat types fail. The yield of einkorn is almost half of that of emmer[13]. In addition the lower tillering rate of einkorn allows more weeds to grow in the fields in relation to emmer[14]. Einkorn is considered to be more winter hardy than emmer[15]. It is also considered to be the only cultivated cereal which, due to the characteristic of its straw, keeps standing after heavy rainfall. Emmer on the other hand tends to lodge. Lodging of cereal plants may reduce the yield seriously. Due to that a possible climatic significance of einkorn dominance seems worthwhile to explore further[16].

The fine flour is nutritious, but gives bread of poor rising qualities. Thus einkorn has been consumed primarily as porridge or as cooked whole grains[17].

Though einkorn is a relic crop it is still present in the modern flora of Romania, being cultivated especially in Transylvania in the mountains area, mainly in the Apuseni Mountains.

Emmer wheat *Triticum dicoccum*: Emmer is a varied aggregate of cultivated tetraploid wheats. Like einkorn wheat it is an autumn, semi-autumn or spring wheat species. According to their response to threshing emmer wheats fall into two groups that are frequently recognizable also in archaeological remains: hulled emmer wheat is the one which interest us *T. turgidum* L. subsp.

[12] Zohary, Hopf 1988, p. 28
[13] Körber-Grohne 1988, p. 322.
[14] Kreutz *et alli* 2005, p. 244.
[15] Körber-Grohne 1988, p. 322
[16] Kreutz *et alli* 2005, p. 244.
[17] Zohary, Hopf 1988, p. 28

dicoccum (traditionally called T. *dicoccum*)[18] in which the products of threshing are the individual spikelets. The grain remains are invested in glumes and pales. In emmer, as in einkorn, threashing results in breaking the rachis of the ear at its weakest points below each spikelet. This parallels the disarticulation pattern in wild einkorn. Hulled emmer represents the primitive situation in cultivated turgidum wheats[19].

According to archaeobotanical results emmer wheat is found together or in combination with einkorn wheat on many archaeological sites[20].

As in the case of einkorn species cultivation of emmer wheat decreased gradually from the Bronze Age, being replaced by *T. spelta* and *T. aestivum*.

Hordeum sp.: cultivated barley is one of the founder crops of Old World Neolithic food production. All over this area barley is a universal companion of wheat, but in comparison with the latter it is regarded as an inferior staple and the poor man's bread[21]. However, barley withstands drier conditions, poorer soils, and some salinity. Because of these qualities, it has been the principal grain produced in numerous areas and an important element of the human diet. Barley is a diploid and predominantly self-pollinated crop. Hundreds of modern varieties and thousands of land races are known. All cultivars have non-brittle ears (i.e. the spikes stay intact after ripening) and are harvested and threshed by man. This is in sharp contrast with the wild barley in which ears are always brittle[22].

Barley is also the main cereal used for beer fermentation in the Old World. Preparation of this beverage seems to be a very old tradition. The crop was, and still is, a most important feed supplement for domestic animals[23].

In the Bronze Age barley is a prevailing cereal being found in most sites belonging to this period. The archaeological discoveries show barley as a close companion of emmer and einkorn wheats.

Conclusions

The Bronze Age incldues important social and economic transformations illustrated by large stable and fortified settlements, by improving specialized agricultural economy such as livestock and crop production. An important role in agricultural technological innovations from the

[18] Zohary, Hopf 1988, p. 37.
[19] Zohary, Hopf 1988, p. 37.
[20] Zohary, Hopf 1988, p. 38.
[21] Zohary, Hopf 1988, p. 52
[22] Zohary, Hopf 1988, p. 53
[23] Zohary, Hopf 1988, p. 52

Middle and Late Bronze Age brought new tools made from hard materials including primitive plows and sickles of bronze.

Communities in the Bronze Age adapted to climate by cultivating species suitable to their environmental conditions. The storage methods and conditions of cereals (whole ear or seed) is not yet known with certainty.

However, studies have shown that storage of whole grain with ear offers better protection against fungi and insects, and the absence of spike bases in the evidence can be linked to their collection from the sites and the floatation techniques[24]. On the other hand it is considered that food storage was not essentially only for the winter season.

Assumptions have been proposed regarding surplus production that was possibly used as a safety measure in areas where annual harvest was fluctuating considerably. This surplus could have important implications when it was used for trade or to purchase other products[25].

An overview of the entire Bronze Age, with reference to the space under our attention reveals that now pastoral communities predominated. These communities preserved their original habits of nomadic or semi-nomadic nature coming from the areas to the north-east areas[26].

Even if these preoccupations are considered the general trend of that time, there is evidence regarding plant processing and cultivation illustrated by the discovery of tools related to agriculture. An important feature of the Bronze Age derived from archaeobotanical research is the purity of the crops. Most analyzed grain samples contained very few impurities. Does this really mean the beginning of specialization of daily activities? In other words, communities that had as main occupation only plants cultivation and exclusively dedicating himself to this occupation?

CONTRIBUŢII LA RECONSTITUIREA DIETEI VEGETALE A COMUNITĂŢILOR *CEHĂLUŢ-HAJDÚBAGOS*

REZUMAT

Studiul de faţă prezintă informaţii inedite privind dieta vegetală a comunităţilor Cehăluţ-Hajdúbagos. Rezultatele arheobotanice publicate cu acest prilej sunt primele date care tratează tipurile de specii de plante incluse în dieta umană a comunităţilor care fac obiectul acestui studiu. Rezultatele se bazează pe analiza macroresturilor vegetale recuperate din contextele arheologice de la Tăşnad-La Sere şi de la Şimleul Silvaniei-Observator.

EXPLICAŢIA FIGURILOR

[24] Perlès 2001, p. 166
[25] Harding 2000.
[26] Vulpe *et alii* 2001, p. 231-232; Cârciumaru 1996, p. 33

Fig. 1. Localizarea geografică a aşezărilor arheologice.
Fig. 2. Cariopse de Triticum dicoccum (Tăşnad-La Sere)
Fig.3. Cariopse de Hordeum sp. (Tăşnad-La Sere)
Fig. 4. Cariopse de Triticum monoccum (Şimleul Silvaniei-Observator)
Fig.5. Cariopse de Triticum dicoccum (Şimleul Silvaniei-Observator)

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Fig. 1. Geographical location of archaeological sites.

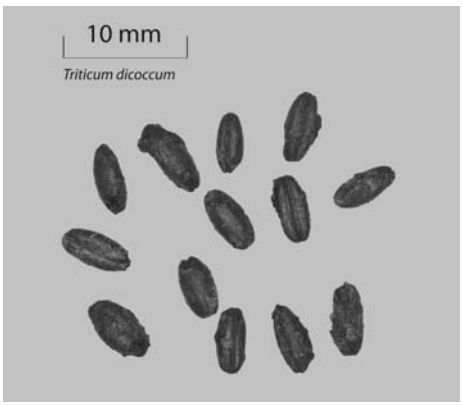

Fig. 2. Triticum dicoccum grains (Tăşnad-La Sere)

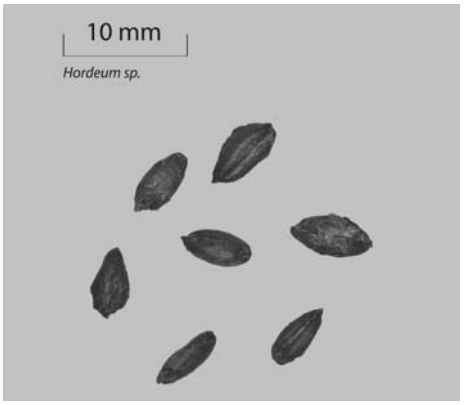

Fig. 3. Hordeum sp. grains (Tăşnad-La Sere)

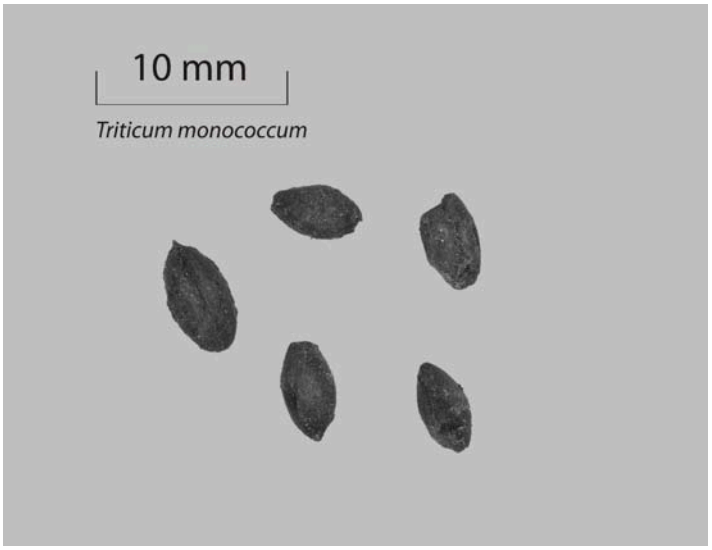

Fig. 4. Triticum monoccum grains (Şimleul Silvaniei-Observator)

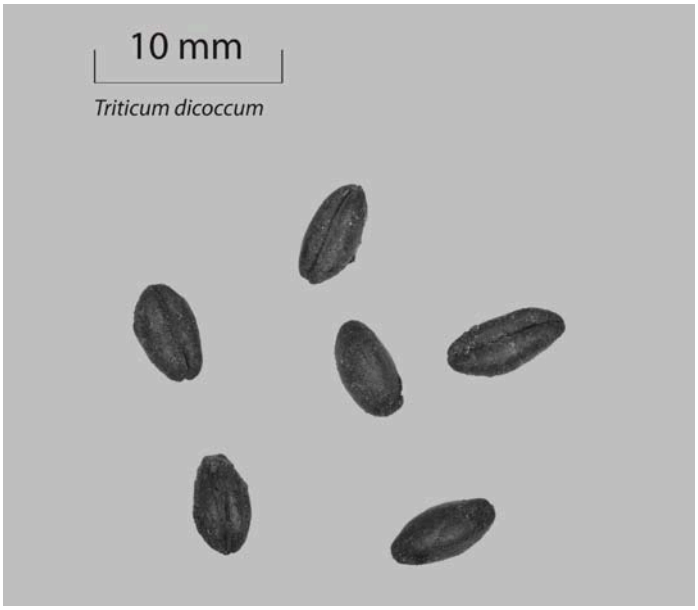

Fig. 5. Triticum dicoccum grains (Şimleul Silvaniei-Observator)