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Project Paper

A Preliminary Interpretation of Analyzed Flotation Samples from Vésztő 20

The prehistory of the Carpathian Basin is well understood in many ways. Lithic, faunal, skeletal, ceramic, and even architectural data are available for most of the prehistoric periods of the region. However, information on the botanical remains recovered from the area is very scarce. As early as the Late Neolithic, there is evidence of grain agriculture and plow technology (Kalicz and Raczky 1987:24). This is thought to have continued until the present and yet there has been no intensive paleoethnobotanical study of the region. The Carpathian Basin is well suited for cultivation of domesticated crops, since the nearby rivers flood yearly, leaving behind a fertile layer of silty clay and organic matter (Raish 1992: 12; Bognár-Kutzián 1972: 160). This allows for agriculture without the use of fallowing or swidden methods practiced around Europe in the Early Neolithic (Harris 1972: 245-262).

After the end of the Neolithic, the people of the Great Hungarian Plain entered the Copper Age, a transition, which brought about dramatic social, architectural, settlement, trade network, and mortuary practice changes (Parkinson 2001). These shifts notwithstanding, the assumption is made that grain agriculture continues, despite the fact that “there is very little paleobotanical evidence available from Tiszapolgár settlements” (Parkinson 1999). The only archaeobotanical study from such a site is a cache of

carbonized wheat from Crna Bara (Bognár-Kutzián 1972: 162). There is no known publication of data collected from the flotation of soil excavated from an Eastern Hungarian Tiszapolgár settlement site. Because of that, such a study would be a valuable source of information on the lifeways of the members of this cultural group.

The following paper discusses an initial investigation of plant remains collected from Vésztő 20, a Copper Age habitation site in Békés County, Hungary. It is hoped that the information below will help to shed new light on the relatively unknown lives of Tiszapolgár people and, more specifically, to support the hypothesized continuity of cultivation of domesticate across the Neolithic-Copper Age transition.

Methods

Recovery of botanical remains can be achieved in various ways. Charcoal and seeds can be manually removed from soil during excavation or from screens during sifting, but these are problematic, since they are biased by the excavator's subjective extraction. A better method is water separation (or flotation). In this method, soil is placed in water and divided on the basis of density. Those components, which are less dense than water, float to the surface, and others, which are denser, sink to the bottom. Because plant remains are generally lighter than water, they can be retrieved from a soil matrix using this method. Flotation is therefore much less subjective than manual removal methods, because it uses the physical properties of the remains themselves as the basis for recovery rather than relying upon the researcher. Water separation yields much smaller-sized remains and larger counts than manual methods as well. It is also

extremely inexpensive to perform, because it requires a vessel of water, soil, and something with which to skim botanical remains. For these reasons, flotation was the technique chosen to extract seeds and charcoal for this project.

Samples:

Soil samples of various volumes (ranging from 0.2L to 7L) were collected from seven archaeological features in the 2000 excavations of Vésztő 20. Additionally, a large (27L) sample was taken from a non-feature trench, as a background source. The makeup of the soil in each sample is a mix of natural and cultural sediments and debris accumulated during and after the occupation of the site. The samples were then allowed to stand for one year to dry, in order to decrease the chance of waterlogged plant remains, which would be less likely to float during water separation.

Flotation:

A bucket was filled three-quarters of the way with water. Soil from the samples was then added in small quantities (ca. 1-2L), while the water was manually whirled – a technique which should decrease the likelihood of plant remains becoming trapped beneath less buoyant particles. The silt and clay suspended in the water was allowed to settle briefly, after which the surfaced particles were skimmed using a very fine polyamide mesh (ca. 0.5mm pores). These fragments are called the light fraction. The remaining water and sediment in the bucket were then poured through a somewhat coarser plastic mesh (ca. 1.3mm pores) and rinsed to remove the silty clay matrix. This denser lot is called the heavy fraction. Both fractions were then allowed to dry thoroughly.

Sorting:

The heavy fractions were massed using an electric balance and the contents noted, however, they were not formally sorted. The light fractions were similarly massed and then sorted (using a 15x hand lens when necessary) into the following groups:

Seeds: Carbonized seeds (unburned seeds could not survive for thousands of years in the archaeological record)

Charcoal: Other burned plant material including wood and straw

Daub: Burned architectural material, which was less dense than water

Shell: Shell, which may or may not be culturally related

Straw, etc.: Straw, roots, uncarbonized seeds and other modern contaminants

Each group was then weighed and labeled. The heavy and light fractions were then bagged and labeled according to their provenience.

Identification:

During the 2001 excavation of Vésztő 20, samples of locally occurring plants were taken, to be used as a comparative collection. They will be identified using Simon (1992) or a similar reference. Part of this collection will then be burned, as a basis of comparison for the burned paleoethnobotanical remains. This method is not infallible because it assumes that the modern environment is the same as that of the Copper Age. Existing comparative collection and books can be used to supplement the created collection to rectify this. Identification of the archaeobotanical remains will take place at Florida State University using microscopy, but some initial possible seed identification has been done during sorting.

Interpretation

The data retrieved in this study are both quantitative and qualitative. It is difficult to quantify paleoethnobotanical remains without first identifying them in order to determine specific ubiquities. However, general ratios such as densities may be relevant. The density of archaeobotanical material in a soil sample may be defined as the mass of charcoal and seeds per volume of soil sampled. This density was determined for the eight samples in this study (Table 1). These numbers seem somewhat meaningless alone. However, when one considers the provenience information of the samples, a pattern emerges (Table 2). Though the sample size is very small, it is interesting that each of the four different source types has a distinct mean density with little to no standard deviation. This may be seen graphically in Figure 1.

The causes for such patterning can be hypothesized quite logically. It makes sense that the postholes would be nearly barren (there were remains in the holes, but they did not register mass on the balance). Posts filled the holes at some point, and had they burned, they would still be there in the form of charcoal. However, there are no charred posts there, so they probably rotted in situ, leaving their molds filled with soil and little carbonized plant material.

Conversely, storage pits were probably intentionally exposed to charcoal, since refuse such as hearth debris would have been a major source of fill when they were no longer used as caches. Therefore, it is no surprise that pits exhibit the highest densities of botanical remains of all of the provenience-types. Interestingly enough, Rocek (1995)

found a similar relationship in similar archaeological features. “The greatest density of macrobotanical remains...derive[s] from the storage pits,” (Rocek 1995: 221).

The third provenience-type, houses, falls in between these two extremes. This also makes sense, if the architectural style is taken into account. The domestic structures were of wattle and daub construction, as evidenced by the huge amounts of the latter excavated from Vésztő 20 during the 2000 and 2001 fieldwork. Daub also makes up the majority of the heavy fractions of the flotation samples and is totally ubiquitous in the light fractions. The dwellings at Vésztő 20 were burned, leaving the daub red and black. These fires also turned the wattle to charcoal. Most of the charcoal recovered is small and longer than it is wide. Wall wattle and roof thatch would look that way when burned. Hearth charcoal would not be expected within the structures, since there is no evidence of internal fire features, but the charcoal extracted from the domiciles could very plausibly be charred construction material. Examination of impressions left in the daub and identification of the charcoal, thought to be wattle will lead great insight into the species of plants used in the construction of these houses.

Agriculture:

As mentioned above, it is hypothesized that the inhabitants of Vésztő 20 subsisted on a diet that included domesticated plant crops because both older and more recent peoples in the region did so. The recovery of a seed, which is currently thought to be from a domestic grass (either wheat or barley), from a sample analyzed in this study support this hypothesis. Other indicators, such as skeletal analysis, the presence of sickles or plows, or traction animal remains would help to defend this idea. However, a slightly more indirect method of showing the presence of agriculture exists. In the same

provenience as the cultigen mentioned above, a *Chenopodium/Amaranthus* seed was found. These species grow best in disturbed soils, such as agricultural fields, and are often used by paleoethnobotanists as an indication of farming. In fact, many people utilize the seeds of these plants to supplement domesticated plant food diets (Ford, personal communication March 2001). The presence of these two seeds in association with one another, indicates that cultivated domesticates were a part of Vésztő 20's inhabitants' sustenance to some extent.

The existence of agriculture at the site can also yield insight into the season of occupation of Vésztő 20. If it is assumed that the cultivars were grown nearby, therefore making the site occupied during key times such as sowing and harvesting, then the inhabitants must have resided there during the spring and autumn. Even if they were growing winter wheat, these two seasons would have been the most important, since sowing and reaping time would just be the inverse of summer-ripened crops. During the summer, while the crops were maturing, it is very possible that many of the residents left to hunt or graze the livestock in other pastures. Unless the populations surrounding Vésztő 20 were belligerent, only a very few people are needed to tend crops once they have begun to grow.

Flotation Method Experiment

Using the methods described above, an experiment was conducted to determine the difference in recovery rates if the ca. 1.3mm mesh were substituted for the ca. 0.5mm polyamide type for skimming the light fraction. It was hypothesized that the finer mesh

would be able to recover more botanical remains than the coarser, since it could retrieve smaller-sized fragments.

The aforementioned 27L background sample was divided into two 13.5L samples, which were then processed in the normal manner, with the exception of the experimental mesh used for half. Unfortunately, one liter of the control group (fine) soil was spilled during flotation, creating a confounding variable. However this did not matter, because the coarser mesh recovered nearly twice the mass of light fraction as the polyamide did, (Table 3). Even correcting for the spilled soil, by using densities leaves the coarser with a much larger number (Table 4). Furthermore, if only charcoal and seed densities are compared, under the assumption that they are have the smallest particle size and would therefore have a higher incidence in the fine mesh, it is still the case that the coarse mesh recovered two times more material (Table 5).

Hence, the results of the test are inconclusive, since there is no way that the coarse mesh could recover more than the fine type. It seems that the samples should have been nearly identical, since they were from the same soil sample, but that is not the case. As chance would have it, the coarser half of the sample simply had more botanicals in it. The densities of the heavy fractions of the two are quite similar (Table 6). If another experiment is undertaken to test the same hypothesis, a different method, involving the stacking of the two meshes, with the finer on the bottom, would be suggested. Thus, any small particles, which might have slipped through the top, would be caught.

Suggestions for Further Work

The next obvious step would be to verify the accuracy of the sorting, making sure that no seeds were overlooked in the light fractions, through the use of microscopy. Sorting of the heavy fractions will also provide valuable information, since some of the charcoal had sunken in the flotation process. The comparative collection should be identified and charred. Then the seeds, charcoal, and, if possible, daub impressions should be identified. The provenience pattern discussed above should be tested further, after more samples are processed.

Appendix I: Tables

Table 1:

Densities of paleoethnobotanical remains per volume of soil.

	Density of Seeds and Charcoal (g/L soil)
EU 1-12	0.05
EU 1-13	0.12
EU 1-15	0.00
EU 1-16	0.00
EU 2-14	0.10
EU 2-15	0.16
EU 2-39	0.02
EU 3-3	0.05

Table 2:

Densities of paleoethnobotanical remains (in grams per liter of soil) by provenience-type.

Provenience	Pit	House	Background	Posthole
	0.12	0.05	0.02	0.00
	0.10	0.05		0.00
	0.16			
Mean	0.13	0.05	0.02	0.00
S.D.	0.03	0.00	0.00	0.00
Median	0.12	0.05	0.02	0.00
N	3	2	1	2

Table 3:

Mass (in grams) of material in light fractions of flotation sample experiment.

Fine	13.6
Coarse	26.3

Table 4:

Density of light fractions (in grams per liter of soil) of flotation sample experiment.

Fine	1.088
Coarse	1.94814815

Table 5:

Density of seeds and charcoal (in grams per liter of soil) of flotation sample experiment.

Fine	0.01
Coarse	0.02

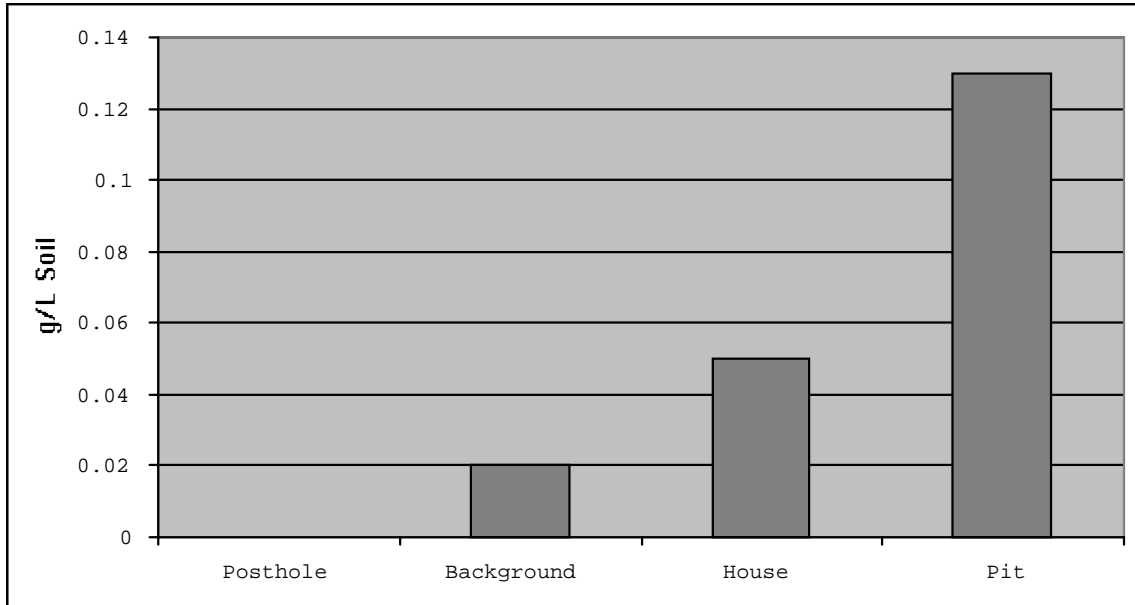
Table 6:

Density of heavy fractions (in grams per liter of soil) of flotation sample experiment.

Fine	51.36
Coarse	52.04

Appendix II: Figures

Figure 1:
Mean Density of Charcoal and Seeds by Provenience-type.



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