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ARCHAEOBOTANICAL INVESTIGATIONS ON SAMPLES RECOVERED FROM DACIAN SETTLEMENTS LOCATED IN TRANSYLVANIAN AREA

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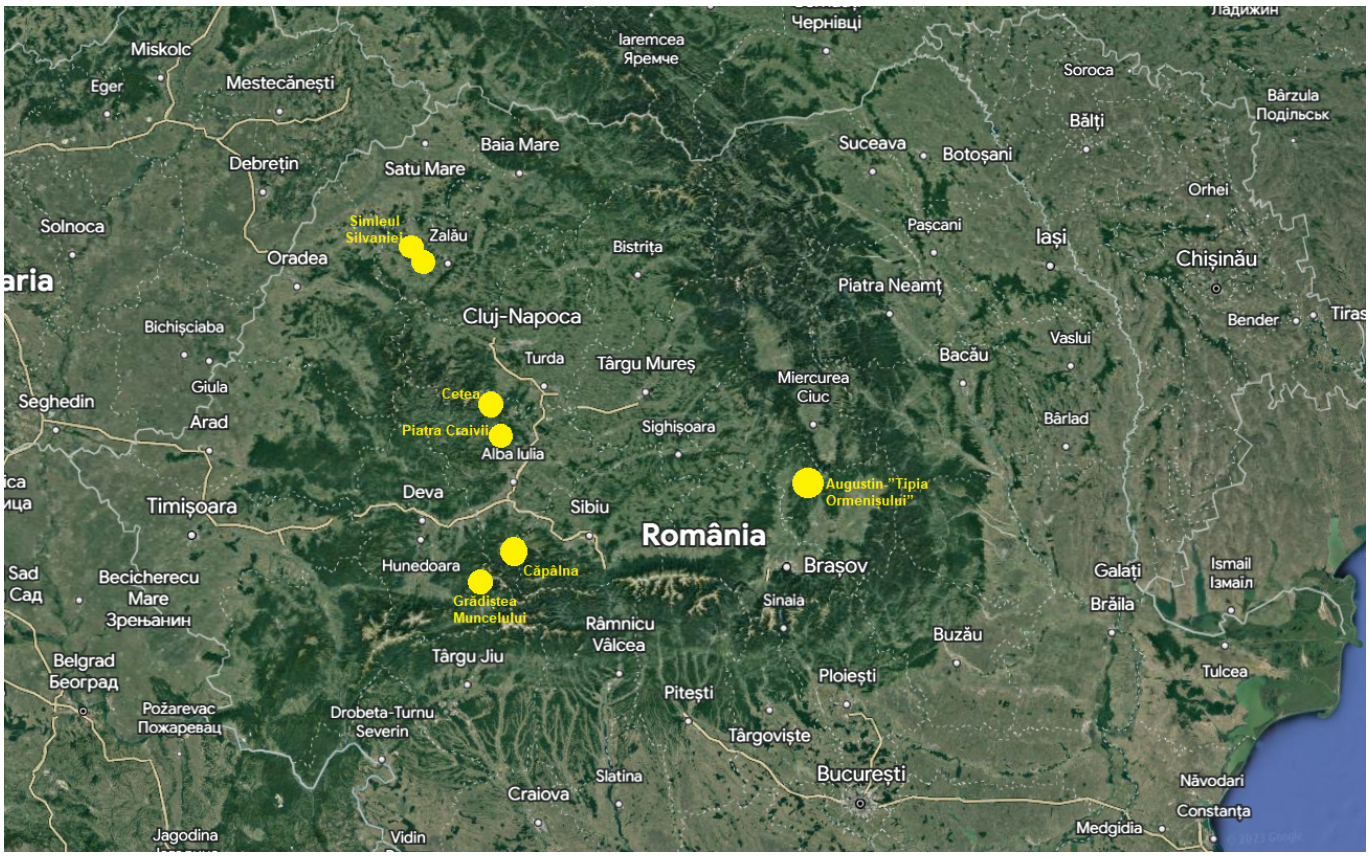
Abstract: This paper presents the results of the archaeobotanical investigation carried out on charred macroremains from several archaeological sites located in Transylvania area which provided valuable insights into the plant economy of Dacian settlements. According with our results, field crop production was based on cereals, legumes and fruits.
The evidence shows that vegetal diet had a significant role in the nutrition of Dacian communities, which in turn were much influenced by the availability and abundance of plant resources but also of the climate conditions. We rely our hypothesis on archaeobotanical data recovered from seven Dacian settlement: Piatra Craivii, Căpâlna, Cetea (Alba County) Augustin-Tipia Ormenișului (Brașov County) Șimleul Silvaniei - Cetate and Observator (Sălaj County) and most important on results gathered in several campaigns from Sarmizegetusa Regia (Hunedoara County). The evolution of human communities has been heavily influenced by the potential sources for life sustenance accessible in the area where they live.
Keywords: *Charred macroremains, Dacian communities, Diet, La Tene, Transylvania area.*

INTRODUCTION

Reconstruction of the plant-based diet of Dacian populations is an important part within their complex lifestyle. Our goal is to reveal which plant species were cultivated in the focused area in order to be included in their diet. It would be interesting to link the plant cultivation with the phase of maximum progress which was possible due to the new advanced iron technology which subsequently improved their lifestyle.

Starting with La Tene period the Dacian society experienced a rapid advance as a result of multitude favourable circumstances. In Transylvania the Dacian horizon spans between ca 200/175 BC- 106 AD[1]. As it was revealed by archaeological discoveries, agriculture was the main base of subsistence, confirmed by the numerous discoveries of iron artefacts used in the agricultural process (plough, sickle and other tools)[2]. Cereals and legumes

[1] RUSTOIU 2021, 17
[2] RUSTOIU/RUSTOIU 2000, 185-188.



Map 1. Dacian settlements location in Transylvania (generated with Google Earth)

were the staple crops of Dacian populations, due to the fact that they were easy to dry and store for long periods.

Wheat, barley, millet, rye, are just some of the cereals used by the Dacian communities in their diet, and the list is accomplished with leguminous species that accompanied them such, beans, peas and lentils. The supplies were deposited in huge storage vessels or in barns (*silos*) that frequently has been revealed in Dacian dwellings during archaeological researches.

For supplementing the food resources, fruits also played an important role. They were collected and stored or dried in ovens, being used in multiple food combinations.

It is worth emphasizing that climate during La Tene was favourable to agriculture, this phase being part of an *optimum climate* with average temperatures and moderate rains.

In order to trace the spectrum of plant species cultivated by Dacian communities we appealed to archaeobotanical analyses carried out on samples recovered from Dacian settlements located in Transylvanian area.

We focused on seven archaeological sites from which we analysed samples containing charred macro-remains. We have to point out that will not insist on the location and description of the selected Dacian settlements. These archaeological information's can be found separately for each site in the bibliographic references from the footnotes and we already describe it did when we published the studies separately for each site. Our main purpose is to outline the list species we managed to identify in last years (Map 1).

ARCHAEOBOTANICAL DATA

Piatra Craivii site (Alba County)

From the well-known *Apoulon* Dacian settlement from Piatra Craivii (Alba county) the settle of *Apouli* tribes[3], has been retrieved four samples containing pure carbonized seeds[4]. Carbonization is the process in which seeds exposed to high temperatures in presence of fire lose their amount of water and in the same time as a result of this process increasing their chances of preservation for long periods of time.

The samples were discovered during the archaeological campaign undertaken in 1962 on the fifth terrace (Terrace V) of the settlement and were deposited in the Museum of Alba Iulia until 2005 when it was „re-sampled" from the Museum storage and were analysed by us in order to establish the plant species they belong.

The fifth terrace from Piatra Craivii was the most intensively researched area[5]. Here was revealed a rectangular sanctuary, the remains of a kiln for reducing/processing of iron, a workshop for shaping stone blocks and several ritual pits. From these pits were recovered directly the charred grains, along with storages vessels, weapons and animal bones. The macro remains appeared in association with the fragments of large, brick-coloured supply vessels. The inventory, was chronologically dated in pre-Roman Dacia, suggesting the moment of deposition as the 1st century

[3] MACREA *et alii* 1966, 45-50;
[4] CIUTA/PLANTOS 2005, 83-94.
[5] MOGA 1981, 103-116

Chr. Unfortunately, the only data discernible on the labels were: Terrace V, depths -1,20m and -1,70m next to numbers 52 and 57 which significance we can't associate it. In order to simplify our work, we numerated the samples from 1 to 4. Thus, after analysing that four samples, three were attributed to the *Cerealia* family, and one to the *Leguminosae* family.

Sample 1, weighing 125 grams, was composed of approximately 16.500 caryopses, identified as belonging to the *Secale cereale* species.

Sample 2, which weighed 50 grams, was composed of approximately 2000 seeds and determined to belong to the *Lens culinaris* species.

Sample 3, weighing 200 grams, contained approximately 15.500 caryopses, which were attributed to the species *Hordeum vulgare* (barley).

Sample 4, weighing 375 grams, was composed of approximately 38.000 caryopses attributed to the same rye species, *Secale cereale*.

Cetea -*La Pietri* site (Alba County)

In the same area but at a distance of approximately 20 km from Cetea-*La Pietri* (Mărițța) site during archaeological researches carried out in 2004-2005 it was unveiled a dwelling from which was recovered a sample consisting of a charred unitary mass of macro remains. The charred sample weights, 23 grams and contains a conglomerate of seeds belonging to the *Panicum miliaceum* species[6].

Șimleul Silvaniei – *Cetate* site, *Observator* site (Sălaj County)

During archaeological research carried out between 1992-1997 in four points located in the proximity of Şimleul Silvaniei[7], were recovered a series of samples containing charred macroremains. They were subject of a detailed archaeobotanical determinations[8] in order to establish their specie. Contexts from which organic macroremains were retrieved belong to a period framed between the 1st century B.C. and the 1st century A.D.

In the following will give a description of the contexts and specie determination, insisting on four samples that caught our attention. The samples were numbered from 1 to 15 in order to simplify our work[9].

Sample 2 originates from the archaeological site Simleul Silvaniei-*Observator*, being recovered from section 1/1995, Pit 54, from a depth of 0.9m and dating from the 1st century BC. It was determined as belonging to *Vicia faba*, garden bean.

In the case of macro organic remains (small fragments of carbonized organic material) numbered as sample *1, 3, 6, 8, 9, 10* we were tempted to set them as bread-like objects category, but until a precise determination (complex specific analyses) we cannot pronounce on it. It is worth pointing out that the situations of discovering some fragments of bread are quite rare, but due to they were part of a carbonization process had offered the chance to preserve it. *Sample 3* originates from the Șimleul Silvaniei- *Observator* site, S 1/1995, GSO, depth 0.34m, 1st century BC. *Sample 6* derive from the archaeological site Șimleul Silvaniei- *Cetate*, Terrace l /1993, dwelling, dated somewhere around the end of the 1st century BC. and the beginning of the 1st century AD.

Samples 8, 9, and *10* recovered from Șimleul Silvaniei-*Cetate* archaeological site, from the same Terrace 2, cassette 3/1997, being recovered from the contents of a metallurgical workshop dated in the first half of the 1st century AD.

Unfortunately, in the situation of *Samples 4* and *5*, a safe determination wasn't possible, but we may point out that is about fragments of organic material. The samples come from the archaeological site Șimleul Silvaniei-*Observator*, within the section S 1/1994, both dated in the period of the 1st century BC.

In the case of *Sample 7* recovered from Șimleul Silvaniei-*Cetate* archaeological site, Terrace 1, Cassette 1, dwelling 5a we recognised the same bean species, *Vicia faba*. The carbonized macro-remains were recovered from a home's hearth.

Samples 14 and *15* are the most important archaeobotanical discovery, because we are dealing with special and very rare situations in archaeological contexts. Both samples were recovered from domestic ovens, revealed on the terrace area. Their determination revealed that belong to *Prunus institia* (*Prunus domestica* L. ssp. institia) a plum specie, but in addition to the charred stone, the most important thing is that the pulp of the fruit was also preserved. Such situations are very rare, because the pulp of the fruit is disintegrated subsequently on the attack of soil bacteria. In the case of sample 15, the whole, charred fruit was preserved. We may assume that the fruits were dried in the oven in order be conserved as supply and some incident led to their carbonisation. This may be the cause which helped the preservation of entire fruit (pulp and stone).

Augustin-Tipia Ormenişului site (Braşov County)

The four samples with carbonized seeds which were analysed in order to identify which species they belong originated from the archaeological excavations carried out in the Dacian settlement from Augustin-Tipia Ormenişului[10]. For the century II BC and the first half of the 1st century BC the entire space was inhabited, archaeological research documenting over 100 contemporary surface dwellings before their destruction by a powerful fire[11]. The fire also favoured the preserving of plant remains that we investigated in 2004[12].

Samples 1, 3, 4 were retrieved from ceramic vessels and *sample 2* was recovered from the floor of a burnt house.

[6] POPA 2006, 181.
[7] POP 2006, 35-36.
[8] CIUTA/POP 2006, 81-87.
[9] CIUTA 2006a, 151-157.
[10] COSTEA/GLODARIU 1991, 21-40
[11] COSTEA *et alii* 2006, 29;
[12] COSTEA *et alii* 2006, 260; CIUTA 2006, 128-130.

In the case of the caryopsis recovered from a jar-type vessel, numbered as *Sample 1*, the determination revealed that they belong to specie *Hordeum vulgare* (barley). *Sample 2* was attributed to wheat specie, *Triticum aestivum* (bread wheat) but due to the fact that the sample was recovered from the floor of a house destroyed by fire, the caryopses were very damaged.

The caryopses from *Sample 3*, belonging to the same species of *Triticum aestivum*, bread wheat, were in a very good state of preservation, due to fact that were retrieved from a storage vessel. In this context caryopses are larger in size than those from sample 2. It may be the circumstances of a previous sorting operation of seeds in order to separate the larges from the smaller one.

The seeds that constitute the *Sample 4*, and which were recovered from a storage jar (*chiup*), were attributed to the wild legume species *Vicia angustifolia* (common vetch).

Căpâlna site (jud. Alba)

The archaeobotanical investigation were carried out on two charred grain samples recovered from Căpâlna (Alba County). The citadel from Căpâlna has played an important role into defensive system created around Dacian fortresses from Orăştiei Mountains[13].

The samples containing the burned cereal seeds were part of the ecofacts collections of the Museum of Alba Iulia and were "re-discovered" during some renovation works. Unfortunately, the information regarding their discovery contexts is no longer preserved on the paper labels. Even in this situation, we considered important to determine the plant species, given that the samples will bring completely new information regarding the plants consumed by the community who lived in the area of Capalna fortress.

Both samples containing the carbonized seeds were identified as belonging to the *Cerealia* family. The *Sample 1* was identified to belonging to *Hordeum vulgare* specie. The weight of the sample is 370 grams counting around 29.5000 seeds. The weight of the second sample is very impressive, respectively 1,10 kg counting around 100.000 seeds. This sample was determined as belonging to *Secale cereale* specie. It seems that both species have been much appreciated in those times. Analogies can be found in determination of species from Piatra Craivii site.

Sarmizegetusa Regia (Grădiștea de Munte, Hunedoara county)

Sarmizegetusa Regia, the capital of the Dacian kingdom[14] is an extremely important site when we talk about the complex reconstitution of the lifestyle of these populations [15]. From the area of this site, impressive quantities of charred seeds of cereals, vegetables and fruits were recovered. The analysis of plant macroremains carried out by us[16], in several archaeobotanical campaigns, helped us draw a relevant profile of the species included in the diet of the populations that have habitat in this area[17].

The preference for bread wheat, *Triticum aestivum*, of these communities is relevant. *Triticum aestivum* was recovered in high proportions compared to the other *Cerealia* species. It is accompanied by emmer wheat and rye, but in modest amounts. All these huge quantities of bread wheat were been retrieved from *burnt granaries* located in perimeter of the site. Among the legumes, the *Fabaceae* species, *Vicia faba* (garden bean) predominates.

Amongst the determined *Cerealia* species are, of course, *Panicum miliaceum*, but also *Hordeum vulgare*. The pea, *Pisum sativum*, the flax, *Linum ustatisimum*, Camelina *sativa* and *Setaria viridis*, complete the list of species found in the settlement. The identification of the specie *Allium sativum* revealed with few cloves of garlic discovered in a house from Sarmizegetusa Regia, is extremely important and interesting, because is the only attestation of the specie in the La Tene horizon in Romania.

DISCUSION

The plant species we managed to identify from these seven sites revealed that vegetal diet played a significant role in the sustenance of Dacian communities, which in turn were very much influenced by the availability and abundance of plant resources but also of the climate conditions (Table 1). The evolution of human communities from this phase has been heavily influenced by the potential sources for life sustenance accessible in the area where they lived.

Choosing, preparing and consuming of food is more than simple subsistence habits. These activities can also be interpreted as complex social rituals. Evidence regarding the category of food consumed by Dacian communities and under what circumstances, and how it is procured and prepared under normal conditions gives us valuable information about certain periods and civilizations[18]. Also, the possibility of storage for long periods was another reason to prefer them instead of other plants[19].

Even today, cereals and legumes represent a major source in human nutrition. They had this important role since earliest times. From these ancient times people appreciated their nutritional value and it is not surprising, given their high carbohydrate content which is an excellent source of calories.

Summarising, we noticed that *Triticum aestivum* is the preferred cereal in Sarmizegetusa Regia and Augustin Tipia Ormenișului sites, together with barley. Instead in Piatra Craivii and Căpalna sites, rye and barley appear in large quantities recovered directly from the silos/granaries. Barley was revealed also in Simleul Silvaniei setlement. From leguminous category, garden bean was predominant, followed by lentils.

[13] MACREA *et alii* 1966, 9; GLODARIU/MOGA 1989, 18-33.
[14] GLODARIU *et alii* 1996, 92-130. FLOREA *et alii* 2013, 63-65.
[15] CIUTA/PLANTOS 2005, 401-405.
[16] A repertoire of cereal and leguminous species on lots from pre-Roman Dacia was published by L. Suciu in 2001.
[17] A detailed study on the plant species included in the diet of the Dacian communities from the Sarmizegetusa Regia site will be published in the following period.
[18] FLINT-HAMILTON 1999, 371.
[19] SUCIU 2001, 173-174.

Tab. 1. Table with the percentage of plant species in the Dacian settlements

Nr crt	Latin species name	Piatra Craivii	Cetea-*La Pietri*	Simleul Silvaniei-Cetate	Simleul Silvaniei-Observator	Augustin-Tipia Ormenisului	Capalna	Sarmizegetusa Regia
1	*Triticum aestivum*					**XXX**		**XXX**
2	*Triticum di-coccum*							**X**
3	*Hordeum vulgare*	**XX**				**XX**	**XX**	**XX**
4	*Secale cereale*	**XXX**					**XXX**	**X**
5	*Panicum miliaceum*		**X**					**XX**
6	*Camerlina sativa*							**X**
7	*Setaria viridis*							
8	*Linum usitatisimum*							
9	*Vicia faba*			**XX**	**XX**			**XX**
10	*Pisum sativum*							**XX**
11	*Lens culinaris*	**XX**						
12	*Vicia angustifolia*					**X**		
13	*Alium sativum*							
13	*Prunus domestica*			**XX**				

(explanation: **XXX**- high; **XX**- medium; **X** -small)

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