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SITE ZAMOSTJE 2

AND LANDSCAPE EVOLUTION IN THE VOLGA-OKA REGION DURING THE HOLOCENE

РОССИЙСКАЯ АКАДЕМИЯ НАУК

ИНСТИТУТ ИСТОРИИ МАТЕРИАЛЬНОЙ КУЛЬТУРЫ

СЕРГИЕВО-ПОСАДСКИЙ ГОСУДАРСТВЕННЫЙ ИСТОРИКО-ХУДОЖЕСТВЕННЫЙ МУЗЕЙ-ЗАПОВЕДНИК

СТОЯНКА ЗАМОСТЬЕ 2

И РАЗВИТИЕ ПРИРОДНОЙ СРЕДЫ ВОЛГО-ОКСКОГО МЕЖДУРЕЧЬЯ В ГОЛОЦЕНЕ

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ГЛАВА 3

FIRST RESULTS OF THE ARCHAEOBOTANICAL STUDY OF THE TEST PIT 2 PROFILE COLUMN

Marian Berihuete

ПЕРВЫЕ РЕЗУЛЬТАТЫ АРХЕОБОТАНИЧЕСКОГО ИЗУЧЕНИЯ КОЛОНКИ ИЗ РАЗРЕЗА ШУРФА 2

М. Бериуэте

INTRODUCTION

Although the use of faunal resources (fish — Radu, Desse-Berset, 2013 — and "terrestrial" — for a compilation see Leduc, Chaix, 2014) is rather well known, our knowledge about the utilization of plants by the inhabitants of Zamostje 2 is not yet comparable.

Till date, archaeobotanical sampling has been non-systematic. Previous carpological analyses were conducted by E. Krutous in 1990/91 and have not been published. Pollen and botanical studies have been carried out by E. Ershova and L.I. Abramova (Ershova, 2013) without focusing on plant economy. A first insight into this topic was given in a previous paper (Berihuete, Lozovskaya, 2014), where preliminary results were presented. By then, over four thousand seeds, corresponding to 35 taxa had been identified. As the majority of those taxa have a variety of known uses, we suggest that the settlers of Zamostje 2 may have used them with alimentary or medicinal purposes and also as raw material (Berihuete, Lozovskaya, 2013). In this paper we present the results (analyses are still ongoing) of the first systematic sample, which consist of a column profile coming from Test pit 2 that was taken during the 2013 field season.

The main interest of archaeobotanical studies is to get information about past people relationships with plants, including the reconstruction of the diet, subsistence, agricultural strategies, social role of food, exploitation of wild resources, procurement of fodder, seasonality as well as the reconstruction of environment (Jacomet, 2013).

At the same time, archaeobotanical studies can also provide intra-site information, revealing workshops, stores, kitchen middens or other areas destined to specific activities.

On the other hand, seeds can be preserved charred in a fossil state or under waterlogged conditions as sub-fossils. In sites with waterlogged preservation, it has been observed that the number of charred remains is by far smaller than the quantity of waterlogged seeds, indicating that in sites where only fossil conservation is possible we are recovering just a few taxa in a reduced quantity. Therefore, because most of the studied sites around the world present a dry conservation, our image

of past plant use is highly biased (the same happens with other materials such as wood or fibres).

Of course that does not mean that it is not worth to study those sites, but reveals how important is that we study the remains coming from sites with special preservation conditions, where we can get a much more accurate picture of past plant use.

Until recent date, archaeobotanical studies have seldom been systematically incorporated to archaeological investigations. Last decades their number has grown progressively, but they usually are made on dry sites where the conservation is only possible thanks to carbonization. Is has already been noted by other researchers (e. g. Jacomet, 2013), that when preservation is poor, the main part of taxa may be missing. This fact has obviously not helped to enhance the understanding of the importance of plant resources for Mesolithic and early Neolithic peoples.

Which plants where used? For which purpose? From which ecosystems did they come from? How was their management? Are there changes in this management along time? These are some of the questions that we ask our archaeobotanical assemblages and that we try to answer in our studies.

MATERIALS AND METHODS

During the field season of 2013, a column of 1,40 meters in length was taken at Test pit 2 (see *Chapter 7, fig. 91*). Column profile samples are a proven tool to know the local vegetation and to clarify the sedimentation history and development of an archaeological site (Jacomet, 1985).

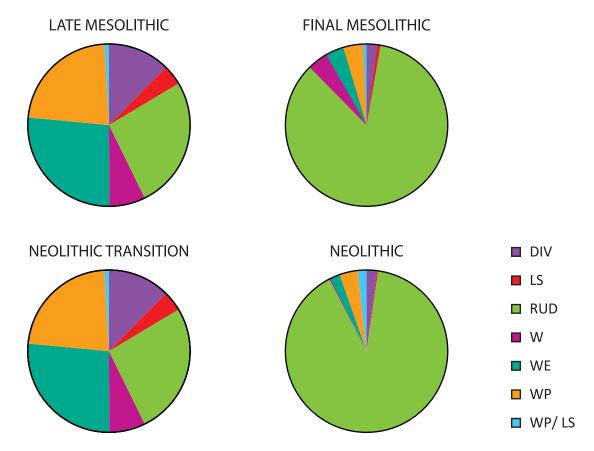
The column was excavated at the laboratory of archaeobotany of the University of Hohenheim (Germany) from bottom to top (following Antolín, 2013). The composition of the different layers was described and, in addition to the layers identified during fieldwork, we found two small sub-layers. The column yielded a total of 10.9 litres of sediment, distributed in 25 different samples. The excavation followed the natural layers and where their width was more than 5 cm they were split into smaller samples.

Table 1. Summary of samples with their corresponding chronologies, litres, remains and concentration values. **Таблица 1.** Сводная информация по образцам, включающая хронологию, объем, число остатков и их концентрацию.

SAMPLES	CHRONOLOGY	GY PROCESSED LITRES		CONCENTRATION	
M 4					
M 3.1.					
M 3a		3800	1405	369.74	
M 3b	LATE MESOLITHIC				
M 3.2.	LATE MESOLITHIC	3600	1405	309.74	
M 3.3.					
M 3.4.					
M 3.5.					
M 2.1.	FINAL MESOLITHIC	850	385	452.94	
M 2.2.	FINAL WESOLITHIC	650	300	452.94	
M 2.2. / 2.3.	MESO/ NEO	400	257	642.5	
M 2.3.					
M 2.4.	NEOLITHIC	2125	1785	840	
M 2.5.	INEOLITHIC	2125	1765	040	
M 2.6.					
TO	TAL	7175	3832		

Table 2. Details of the analysed samples: Processed volume, analysed fractions, seed remains, volume of the fractions, final analysed volume, real number of remains, estimated number of remains, density of remains per litre and number of taxa. **Таблица 2.** Детализация изученных образцов: обработанный объем, анализируемые фракции, объем фракций, финальный проанализированный объем, реальное число остатков, оценочное число остатков, плотность остатков на литр и количество таксонов.

Sample	Layer	Vol. (ml)	Fract.	Fract. (Vol.)	Analyz. Vol.	Remains (Total)	Remains (estim.)	Density (r/l)	Taxa				
M 4 9–10	500	2	90	90	7	7	- 60	23					
	500	0,315	60	60	23	23	- 60	23					
M 3.1. 8	450	2	150	150	34	34	717,78	27					
	450	0,315	135	50	107	289							
^	8	100	2	35	35	2	2	- 270					
Α	ŏ	100	0,315	12	12	25	25	270	13				
В	8	400	2	150	150	30	30	245	15				
В	8	400	0,315	60	60	108	108	345	15				
M 3.2.	7	550	2	150	150	65	65	F24 24	2.4				
IVI 3.2.	/	550	0,315	125	50	92	230	536,36	26				
Maa		0 7	2 7	_	_		2	137	137	45	45	425	2.4
M 3.3.	7	600	0,315	200	50	54	216	435	24				
M 2 4	7	600	2	200	200	39	39	411 47	20				
W 3.4.	M 3.4. 7		0,315	260	50	40	208	- 411,67					
M 3.5.	7	4.00	2	225	225	107	107	736,37	25				
IVI 3.5.	/	600	0,315	215	50	78	335	730,37					
M 2.1.	6	400	2	75	75	50	50	- 1100	19				
IVI Z. I.	0	400	0,315	195	50	100	390	1100	19				
Maa	,	450	2	100	100	24	24	2102.22	15				
M 2.2.	6	450	0,315	240	50	192	922	2102,22	15				
M 2.2./2.3. 5	400	2	150	150	15	15	1042 F	1.1					
	2.2./2.3.	2.3.	400	0,315	160	50	228	729,6	1862,5	14			
M 2.3. 4	2 4	425	2	210	210	102	102	- 3252,8	15				
	4 625	0,315	215	50	449	1931	3252,8	15					
M 2.4. 4	4	4 500	2	210	210	107	107	2242	10				
	4		0,315	158	50	495	1564	3342	19				
M 2.5.	4	450	2	150	150	61	61	1240	17				
IVI Z.5.	4	450	0,315	154	50	179	551	- 1360					
MOG	4	EEO	2	150	150	41	41	1042 64	17				
M 2.6. 4	IVI ∠.6.	4	550	0,315	210	50	127	533	1043,64	17			



Graphic 1. Ecological origin of species for each period. Diverse (DIV); Lake Shore species (LS); Ruderal (RUD); Woodland (W); Woodland Edges (WE); Water Plants (WP) and Water Plants or Lake Shore Plants (WP/LS).

График 1. Экологическое происхождение видов для каждого периода. Разные (DIV); Берега озера (LS); Рудеральные (RUD); Лесные (W); Кромки леса (WE) виды; Водные растения (WP) и Водные или Прибрежные растения (WP/LS).

Fifteen samples with a total of 7175 ml (table 1) were processed following the "wash-over" technique (Kenward, 1980) and the floating remains were recovered in sieves of 2 and 0,315 mm mesh size. The inorganic fraction, as well as the 2 mm fraction, were analysed in their totality, while from the 0,315 mm fraction a subsample of 50 ml was studied under the magnification of a stereoscope.

Plant remains, mainly seeds and fruits, have been retrieved and identified according to their anatomical features. Charcoal and wood materials are still under study. Other remains such as *opercula* of Bithynia or fish scales have also been quantified or semi-quantified, as well as archaeological remains such as small ceramic or twine fragments.

Graphs were produced with the program R-studio (0.98.945, R-Studio Inc.) using the package ggplot2 (Wickham, 2009).

RESULTS

A total of 3832 remains, corresponding to 51 plant taxa have been identified, along with oospores of *Chara* sp. and sclerotia of *Cenococcum* sp. (table 1). The majority of the remains are preserved in a subfossil state, thanks to the waterlogged conditions of the site, and only a few individuals of some species show signs of alteration by fire (*Najas marina*, *Nuphar lutea*, *Pinus* sp. and *Rubus idaeus*).

The taxa have been classified into ecological groups following actualistic criteria, in order to try to describe and understand the composition of the archaeobotanical assemblage. These groups are: Ruderal (RUD); Woodland (W); Woodland Edges (WE); Lake Shore species (LS); Water

Plants or Lake Shore Plants (WP/LS); Water Plants (WP) and Diverse (DIV) (table 3).

According to the archaeological information, these samples correspond to three cultural phases. For the first one, Late Mesolithic (upper layer, 6400-6000 cal BC), 3,8 litres have been processed, and 1405 remains have been recovered, with a concentration of 369,74 remains per litre (table 1). This layer is characterized by species coming from the "Wood edge" zone (graphic 1), especially raspberry (Rubus idaeus L.) and also guelder rose (Viburnum opulus L.). Woodland species like bird cherry (Prunus padus L.) and ruderal plants like pale persicaria (Polygonum lapathifolium L.) or goosefoot (Chenopodium album L.) are relatively abundant. Water plants like yellow water lily (Nuphar lutea L.) are also more abundant in this period than in the later phases. The average amount of taxa among the samples of this layer is 21 taxa, a value higher than in the following layers. This species richness could be due to the higher amount of processed litres; however the concentration of remains per litre of sediment is lower than during the other periods (table 3).

The second layer corresponds to the Final Mesolithic (with a preliminary date of ca. 6000–5800 cal BC). 850 ml were processed and 385 remains recovered, being the average concentration per litre of 452,94 remains. The ruderal species, mainly goosefoot species (*Chenopodium glaucum /rubrum* and *Ch. album* L.), are predominant (graphic 1), while bird cherry (*Prunus padus* L.) and guelder rose (*Viburnum opulus* L.), growing in the woodlands and woodland edge are also represented.

Table 3. Species identified in the Test Pit 2 profile sample. W= waterlogged; C= charred **Таблица 3.** Виды, идентифицированные в образцах из профиля шурфа 2. Обозначения сохранности: насыщенный водой (W); карбонизированный (C).

SPECIES	LATE MESO	FINAL MESO	MESO/ NEO	NEO	TOTAL	PRESER.				
RUDERAL PLANTS										
Chenopodium album L.	51	71	64	358	544	W				
Chenopodium glaucum/ rubrum	39	178	142	959	1318	W				
Polygonum lapathifolium L.	142	37	17	187	383	W				
Solanum cf. nigrum L.	2	1	-	-	3	W				
Urtica dioica L.	15	4	11	17	47	W				
WOODLAND PLANTS										
Alnus glutinosa (L.) Gaertn.	23	9	-	2	34	W				
Betula sp.	27	2	-	2	31	W				
cf. Pinus sp. needle	1	-	-	-	1	C/W				
cf. Pinus sp. scale	1	-	-	-	1	W				
Prunus padus L.	67	9	1	9	86	W				
Scrophularia sp.	1	-	-	-	1	W				
Solanum cf. dulcamara L.	1	-	-	-	1	W				
	woo	DDLAND EDGE	PLANTS							
cf. Potentilla sp.	1	-	1	1	3	W				
Rubus cf. saxatilis L.	1	-	-	-	1	W				
Rubus idaeus L.	502	16	1	45	564	C/W				
Viburnum opulus L.	54	20	5	27	106	W				
	L/	AKE SHORE P	LANTS							
Alisma plantago-aquatica L.	8	1	-	2	11	W				
Bidens cf. cernua L.	2	2	3	-	7	W				
Carex rostrata type	23	-	-	1	24	W				
Carex sp.	14	-	-	4	18	W				
Filipendula ulmaria (L.) Maxim	1	-	-	-	1	W				
Lycopus europaeus L.	1	1	-	-	2	W				
Phragmites sp.	2	-	-	-	2	W				
Polygonum cf. persicaria L.	1	-	-	-	1	W				
Ranunculus cf. sceleratus L	2	1	-	-	3	W				
Rumex cf. maritimus L.	3	-	-	-	3	W				
	LAKE	SHORE/ WAT	ER PLANT							
Sagittaria/ Alisma	1	-	-	-	1	W				
Schoenoplectus sp.	12	3	4	45	64	W				
WATER PLANTS										
Ceratophyllum demersum	4	1	-	-	5	W				
Characeae	18	-	1	-	19	W				
Hippuris vulgaris L.	2	-	-	-	2	W				
Menyanthes trifoliata L.	16	3	2	5	26	W				
Myriophyllum spicatum L.	5	-	-	2	7	W				
Najas marina L.	31	-	-	5	36	C/W				
Nuphar lutea (L.) Sm.	48	16	1	25	90	C/W				
Nymphaea sp.	9				0	14/				
<i>y</i> , .	9	-	-	-	9	W				

SPECIES	LATE MESO	FINAL MESO	MESO/ NEO	NEO	TOTAL	PRESER.
Potamogeton sp.	176	-	-	3	179	W
Ranunculus cf. aquatilis L.	1	-	-	-	1	W
Sagittaria sagittifolia L.	8	-	-	3	11	W
Sagittaria/ Alisma	1	-	-	-	1	W
Sparganium sp.	46	6	4	54	110	W
cf. Stratiotes aloides L.	2	-	-	-	2	W
Trapa natans L.	2	-	-	-	2	W
		DIVERSE				
Apiaceae	1	-	-	3	4	W
Cenococcum	3	-	-	-	3	W
Cyperaceae/ Polygonaceae	-	-	-	15	15	W
Cyperaceae	26	2	-	3	31	W
Indet Najas type	1	1	-	2	4	W
Linum type	-	1	-	-	1	W
Ranunculaceae/ Solanaceae	-	-	-	1	1	W
Ranunculus sp.	7	-	-	1	8	W
cf. Rubiaceae	1	-	-	-	1	W
TOTAL	1405	385	257	1785	3832	-
CONCENTRATION (r/I)	369.74	452.94	642.5	840	530.07	-

While excavating the column in the laboratory, we found that sample "2.2/2.3." had characteristics of both Final Mesolithic and Neolithic layers and we labelled it as Meso/ Neo transition. This name does not correspond to a layer identified by archaeologist in the field, but to the characteristics observed in a single sample that presented mixed features of both phases and that could not be exclusively related to only one of them. This sample had a volume of 400 ml and yielded 257 remains, being its concentration of 642,5 remains per litre. Its composition is led by ruderal species, in particular by goosefoot species (*Chenopodium glaucum /rubrum* and *Ch. album* L.) (graphic 1).

The most recent analysed layer corresponds to the Early Neolithic (ca. 5800–5200 cal BC). From this layer a total of 2125 ml of sediment have been processed and 1785 remains have been recovered, with a density of 840 remains per litre. For this period, woodland and woodland edge species constitute only a 5% of the total quantity of remains, while the assemblage is clearly dominated by goosefoot species (*Chenopodium glaucum | rubrum* and *Ch. album* L.) that represent 84% of the remains (graphic 1).

DISCUSSION

It is thought that the activities carried out by the people of Zamostje 2 were located at the shore of an ancient lake. The retrieved remains and artefacts comprise a wide range of fishing tools (nets, traps, hooks) as well as a large amount of fish bones and spines. However, water plants and lake shore species, although varied (28 taxa in the Late Mesolithic and 12 in the Neolithic phase) and ubiquitous along time (their amount and variety decreases, but some of them are present along all the periods) are not the main component in quantitative terms of the archaeobotanical assemblages.

Moreover, this difference among the chronological phases could be taken as a sign of the importance of the human factor in the formation of the archaeobotanical assemblages. The amount of remains affected by fire is quite low, but the quantity of wood charcoal is not much higher, what seems to indicate that activities that implied the use of fire/ hearths were not frequently or regularly performed in the area, more than a lack of human intervention.

On the other hand, several of the identified species have many known uses and have been recurrently retrieved from other Mesolithic and Neolithic sites. In the following lines we present some of those species, which are thought to have been important contributors, if not staples, for the diet of past populations.

This is the case of the **goosefoot** species, frequently found at Mesolithic sites. Its presence is often an indicator of areas disturbed by human action and among agricultural societies it is classified as a weed. However, seeds and leaves of most Chenopodiaceae are edible and widely used for food (for instance white goosefoot (*Chenopodium album* L.) leaves among the Native of Alaska, Moerman, 1998). Achenes of white goosefoot have been found at the Mesolithic site Tybrind Vig in Sweden (Kubiak-Martens, 1999) or at the Neolithic Stare gmajne in Slovenia (Tolar et al., 2011).

Charred and waterlogged remains of **yellow water lily** (*Nuphar lutea* L.) have been recovered at Zamostje 2. Leaves, roots and seeds are edible. The seeds for instance, contain 80% of carbohydrates. This species has also some medicinal properties, as an anti-inflammatory for instance. It has been recorded in large quantities or even in a charred state, at other sites, like in the Neolithic Russian sites of Naumovo, as well as Serteya I and specially II (Berihuete et al., 2013) or Hoge Vaart in the Netherlands (Brinkkemper et al., 1999).

Bird cherry fruits (*Prunus padus* L.) have many known uses: as food, being edible its fruits, flowers, leaves and even the bark, and also as a medicine. The fruits, although very bitter in taste, are rich in vitamins A and C and Beta-carotene. They ripen in summer (July to August) and could have been dried for later use, like other *Prunus* species (interestingly, not only the fruits without preparation, because the Iroquois for instance made cakes with smashed fruits and let them dry for storage, with species like *Prunus pensylvanica L. f.*, Moerman, 1998). Bird cherry fruit stones have been found in relatively high amounts in the Neolithic site of Serteya I and II (Berihuete et al., 2013), and at other Neolithic sites all around North and Central Europe, till the Iberian Peninsula (Cova del Sardo et al., 2012).

Also very frequent is **raspberry** (*Rubus idaeus* L.). The fruits are edible, and seeds have been found at many archaeological sites, like the Mesolithic Tagerup in Sweden (Regnell, 2011), or the Neolithic site of Can Sadurní in Catalunya (Antolín, Jacomet, 2014) or the alpine site of "La Chenet des pierres" in France (Martin et al., 2008). Roots and young stems can also been consumed. The leaves of raspberry are also used in traditional medicine to prepare a tea that has birthing aid, astringent, antiinflammatory and decongestant properties (PFAF). In Zamostje 2 it is the main species during the oldest phases. Most of the seeds have been preserved in a waterlogged state, but two seeds appeared charred.

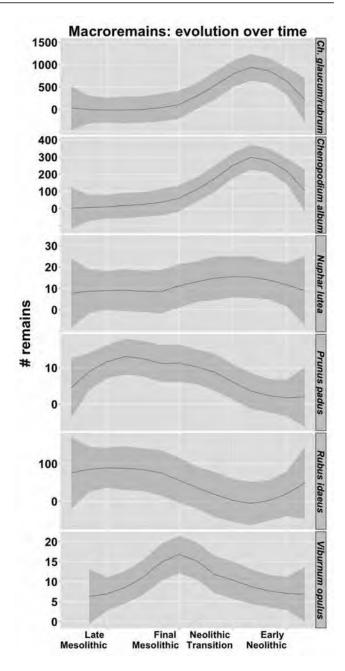
Guelder rose seeds have been found waterlogged. The edible fruits are very rich in minerals such as potassium, magnesium, phosphorus and iron (Hakki et al., 2013) and they have also high antioxidant properties (Rop et al., 2010). There are many ethnographical references to them as a food or to the bark as a medicine with antispasmodic and astringent properties. Moreover, the fruits can be used fresh to make a red dye and dried for a black one (PFAF). The fruits ripen in autumn and can be dried and stored for later consumption. Seeds and fruits of Guelder rose have been found in the Neolithic layers of the site Serteya I and II (Berihuete et al., 2013), or of the lake shore site of Stans Kehrsiten in central Switzerland (Brombacher, 2010).

Other species that are frequently found at archaeological sites of these chronologies and thought to have been an important contributor to the diet (possibly as a staple), is **water chestnut** (*Trapa natans* L.), retrieved at the sites Usviaty IV (Лозовская, 2011) and Serteya I and II (Berihuete et al., 2013) and in the Federsee in Germany (Karg, 2006).

Beyond of the possible uses that the identified species could have had, we can appreciate that the intensity in their exploitation varies over time. First of all, we see that within Mesolithic levels, there is a wider range of represented taxa. Secondly, the quantity of recovered remains for some species is significantly different, not only regarding the number of remains (graphic 2), but also their concentration within the samples.

In the case of the goosefoot family, we can see that their amount starts to increase from the Final Mesolithic onwards, to arrive to their maximum in the Neolithic, with significant differences in concentration. In the case of *Chenopodium glaucum/rubrum*, we find the peak in the Neolithic, with a concentration of 2391 remains per litre of sediment in sample 2.3. Regarding *Ch. album* we find the higher values at 801,84 remains per litre in sample 2.4. It is notable that both species present a similar tendency (graphic 2), what could be related to the places where they were growing, but also with the uses that people could have given them.

Regarding yellow water lily, although not present in high amounts in any period, its presence is continuous from Mesolithic to Neolithic. After a maximum in Late Mesolithic, the abundance of this species remains stable on a low level.



Graphic 2. Evolution of representative species over time.

График 2. Эволюция репрезентативных видов с течением времени.

Bird cherry is another of the taxa which maintains their presence in all phases. It has its peak between the Late and the Final Mesolithic. Afterwards, the amount of retrieved remains decreases.

Raspberry abundance shows strong differences along time. While high amounts are found in Late Mesolithic samples, it almost disappears from our samples at the end of the Final Mesolithic, and only few remains are found in the Early Neolithic sediments.

Finally, guelder rose is completely absent from the oldest analysed samples. Later on, its presence starts to grow with a peak towards the Final Mesolithic, falling down abruptly to reach very low levels during the Neolithic.

According with the data we observe, in the first place, a reduction of the overall variety of exploited taxa, and, in the second place, a change in the intensity on the use of some of these species.

But which factors could influence these changes and the evolution of plant use? The pollen record (Ershova, 2013) does not show any significant change in available species, which could point to natural causes as the agent responsible of this shift. If these changes were to be related to human activities, the hypothesis and possible explanations that we are working with are the following: a) There is a shift in the ecosystems that are exploited. A tendency towards terrestrial above lake shore/ water resources is observed in the exploitation of faunal resources (Leduc, Chaix, 2014). However, in the case of the plant resources it is not so easy to explain. Although it is true that a water species (yellow water lily) seem to have had certain importance during Late Mesolithic that would not explain the changes in plant exploitation, since the main represented species (raspberry) comes from the woodland edges, which constitutes also a potential place to harvest goosefoot species.

Other possible explanations are: b) A change in the traditions, habits or tastes; c) As it happens with other materials like pottery, new knowledge is available and maybe species that till then were not recognized as edible or to which no attention was given, took a relevant role in the diet; d) A new economic organization starts to develop in which the exploitation of other kind of resources becomes more important. That could explain the switch from a species difficult to store like raspberry, to an easy storable product like goosefoot seeds and finally, e) There are new possibilities of exploiting other kind of resources, for instance thanks to the use of pottery, new cooking techniques or storage facilities become feasible.

CONCLUSION

The results, yielded by the study of the first 15 samples of the profile coming from Test pit 2, are highly interesting. The retrieved information can be interpreted in its synchronic context, but also allows diachronic estimations. That means that we can track the evolution in the use of a particular taxon or the introduction of a new species, and try to fit this information to the interpretation of the other archaeological remains. We do not have yet an explanation to these changes regarding the presence of the different taxa within our samples and it has still to be proved if this tendency is confirmed by further samples, since the results of the profile cannot be directly related to the whole site. Nevertheless, although preliminary, they form the basis of our future research and allow us to draw some hypothesis.

It seems that fruits and berries were systematically gathered and their use extends to the Neolithic phase. Wild plant resources may have played valuable role for the communities that lived there, contributing with important nutrients to the diet, and additionally used as raw material and as medicine.

Apparently, there is a change in which resources are being exploited, that starts at the end of the Final Mesolithic (all the tendencies vary in this moment, some decreasing and others increasing). Further studies will allow us to give shape to this picture.

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