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Project Gallery

Crop choice, gathered plants and household activities at the beginnings of farming in the Pelagonia Valley of North Macedonia

Ferran Antolín[1,*], Amalia Sabanov[2], Goce Naumov[3] & Raül Soteras[1]

[1] Integrative Prehistory and Archaeological Science, University of Basel, Switzerland
[2] Laboratory for Bioarchaeology, University of Belgrade, Serbia
[3] Museum of North Macedonia, North Macedonia
* Author for correspondence: ✉ ferran.antolin@unibas.ch

A combined archaeobotanical and micro-refuse analysis is being implemented at two Early Neolithic tells currently under excavation in the Pelagonia Valley: Vrbjanska Čuka and Veluška Tumba. The first results suggest similarities with Greek sites that show a relatively broad crop spectrum.

Keywords: Europe, Neolithic, tell, archaeobotany, micro-refuse analysis

North Macedonia and the Neolithisation of South-eastern Europe

The current state of research suggests that the Neolithisation of South-eastern Europe started in Thessaly, after the arrival of early farmers from western Anatolia via maritime networks *c.* 6500 BC, and spread northwards, most likely along the Vardar River and the Pelagonia Valley (Naumov 2015; Krauss *et al.* 2018). These early farmers often settled in villages that developed into tell sites. Archaeobotanical investigations have provided highly valuable information on the set of crops grown in different areas (e.g. Ivanova *et al.* 2018; Gaastra *et al.* 2019). The crop assemblages found in sites located in Thessaly and Thrace kept many similarities with those known from Anatolia. Conversely, a more reduced crop assemblage spread into the Balkans (e.g. Colledge & Conolly 2007; Marinova *et al.* 2016; Marinova 2017), with a more limited range of pulses, and also lacking some of the cereals such as naked barley (*Hordeum vulgare* var. *nudum*). Nevertheless, with the exception of Bulgaria (e.g. Kreuz & Marinova 2017), the state of research for these early phases is still precarious because of the paucity of evidence (Valamoti & Kotsakis 2007). Despite new research in the Korça Basin, Albania (Allen & Gjipali 2014), the Struma Valley, Bulgaria (Marinova *et al.* 2016; Marinova 2017), and the Pelagonia Valley (Beneš *et al.* 2018), we have limited knowledge of the nature of farming, domestic activities, refuse management and the overall role of cultivated and gathered plants in the Neolithic diet. Our project aims to

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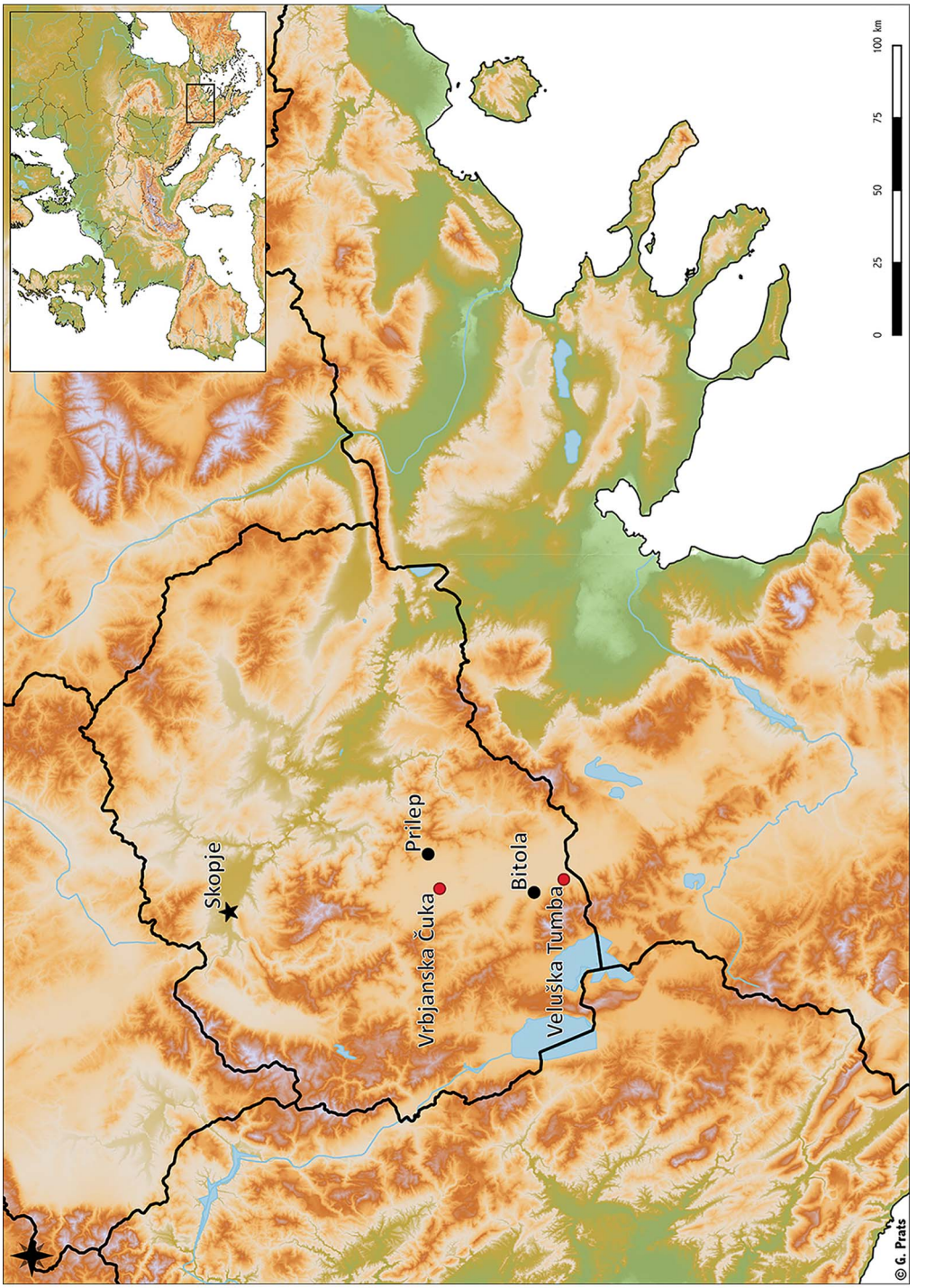

Figure 1. Map showing the location of the sites (map by G. Prats).

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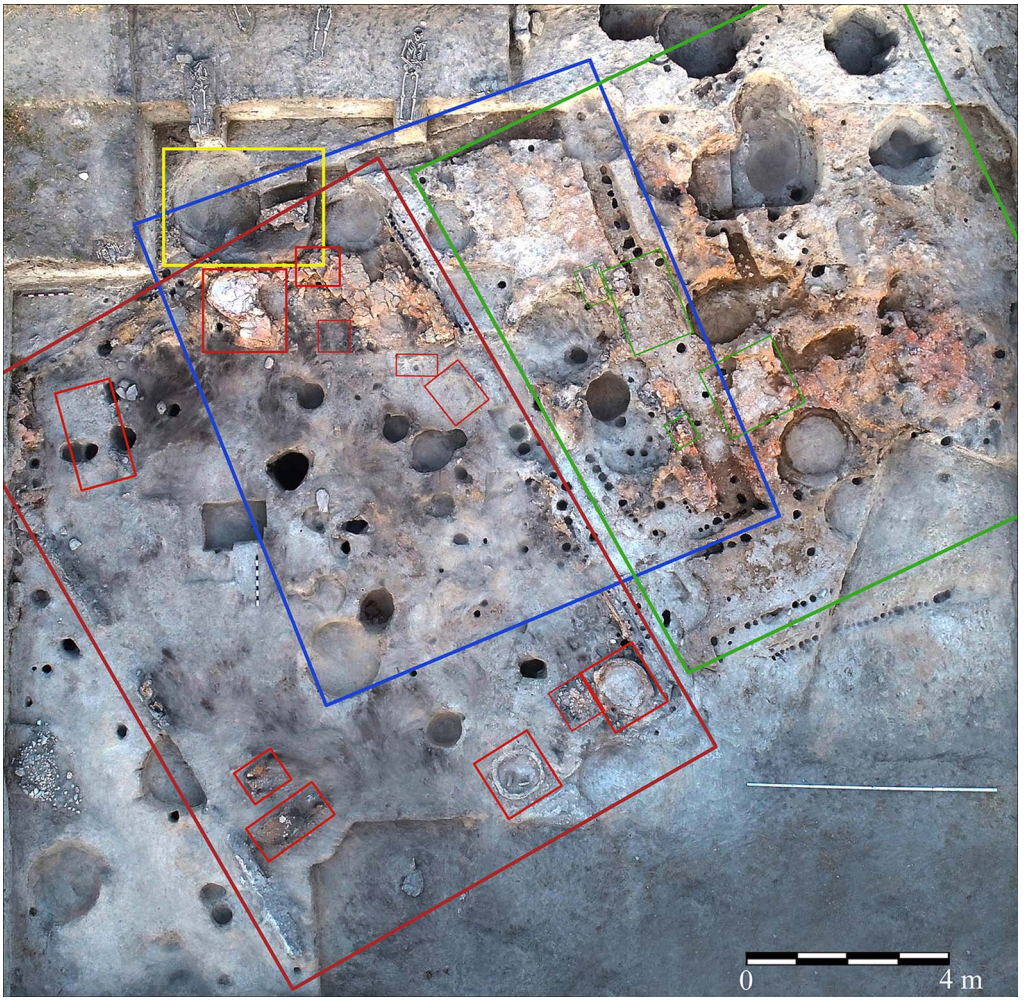

Figure 2. Area of the 2019 excavation at Vrbjanska Čuka, with the different buildings and associated features shown via colour-coding (photograph by Hristijan Talevski, edited by Goce Naumov).

understand these factors by applying micro-refuse and archaeobotanical analyses to Macedonian sites.

Two roughly contemporaneous sites located in the northern part of the Pelagonia Valley, in North Macedonia, are currently being investigated: Vrbjanska Čuka and Veluška Tumba (Figure 1). Vrbjanska Čuka is one of the biggest Early Neolithic tell sites in the valley with a surface area of around 2500m^2, and both sites have stratigraphic deposits reaching 2–4m in height, with several building phases dated to *c.* 6000–5700 cal BC. Vrbjanska Čuka shows a remarkable preservation of floor levels, clay storage bins, grinding areas and hearths (Naumov *et al.* 2018a & b) (Figure 2). The continental climate of the Pelagonia Valley makes these sites of particular interest for the Neolithisation process.

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Table 1. Preliminary results of the 2019 campaign at Vrbjanska Čuka; only cultivars and gathered plants shown (*Secale* sp. and *Setaria* sp. finds excluded).

	NR	Ubiquity (19 samples)
Cultivated plants		
Naked barley (*Hordeum vulgare* var. *nudum*), grain	3	15.8
Hulled barley (*Hordeum vulgare* var. *vulgare*), grain	7	15.8
* Barley (*Hordeum distichon/vulgare*), chaff	7	15.8
Emmer (*Triticum dicoccum*), grain	12	21.1
* Emmer (*Triticum dicoccum*), chaff	69	52.6
Einkorn (*Triticum monococcum*), grain	28	63.2
* Einkorn (*Triticum monococcum*), chaff	743	57.9
2-gr einkorn (*Triticum monococcum*), grain	4	15.8
Lentil (*Lens culinaris*)	5	21.1
Pea (*Pisum sativum*)	45	36.8
Bitter vetch (*Vicia ervilia*)	2	10.5
Gathered plants		
Hazelnut (*Corylus avellana*)	1	5.3
Sloe (*Prunus spinosa*)	6	21.1
* Bramble (*Rubus fruticosus*)	17	15.8
Elderberry (*Sambucus* sp.)	4	10.5
* Wild strawberry (*Fragaria vesca*)	5	10.5
Crab-apple (*Malus* sp.)	1	5.3
Volume of sediment (L)	89.08	

* These taxa are underrepresented in the table because the 0.35mm fraction has only been analysed in 13 of the 19 samples.

Reconstructing 'taskscapes': a micro-refuse approach

The 2019 campaign allowed the testing of the methodology for the study of refuse management and indoor activities at Vrbjanska Čuka. This approach involves a systematic sampling of multiple contexts from each house (samples of 10 litres), wet-sieving of the samples with the wash-over technique (Steiner *et al.* 2015), and sorting of all fractions (organic and inorganic or heavy fractions). For the analysis of the elements found in the different fractions, a micro-residue approach was applied (Ullah *et al.* 2015). Over 30 variables, including any recognisable category preserved in the fractions (sand and daub fragments, calcined bone, tubers and the like), are quantified. The main aim is to identify patterns in the small-sized remains that would otherwise be hidden in the sediment and that reflect anthropogenic activity and may better show the spatial patterns of domestic tasks (e.g. areas of cereal processing, meat processing and refuse disposal).

Preliminary results from Vrbjanska Čuka

Four cereal crops and three pulses were documented at Vrbjanska Čuka; no oil plants have been discovered so far (Table 1 & Figure 3). The crop spectrum is similar to that known from sites in Greece, although naked wheat (*Triticum aestivum/durum/turgidum*) and new glume wheat (*Triticum* sp./new type) are absent. Gathered plants were found, including

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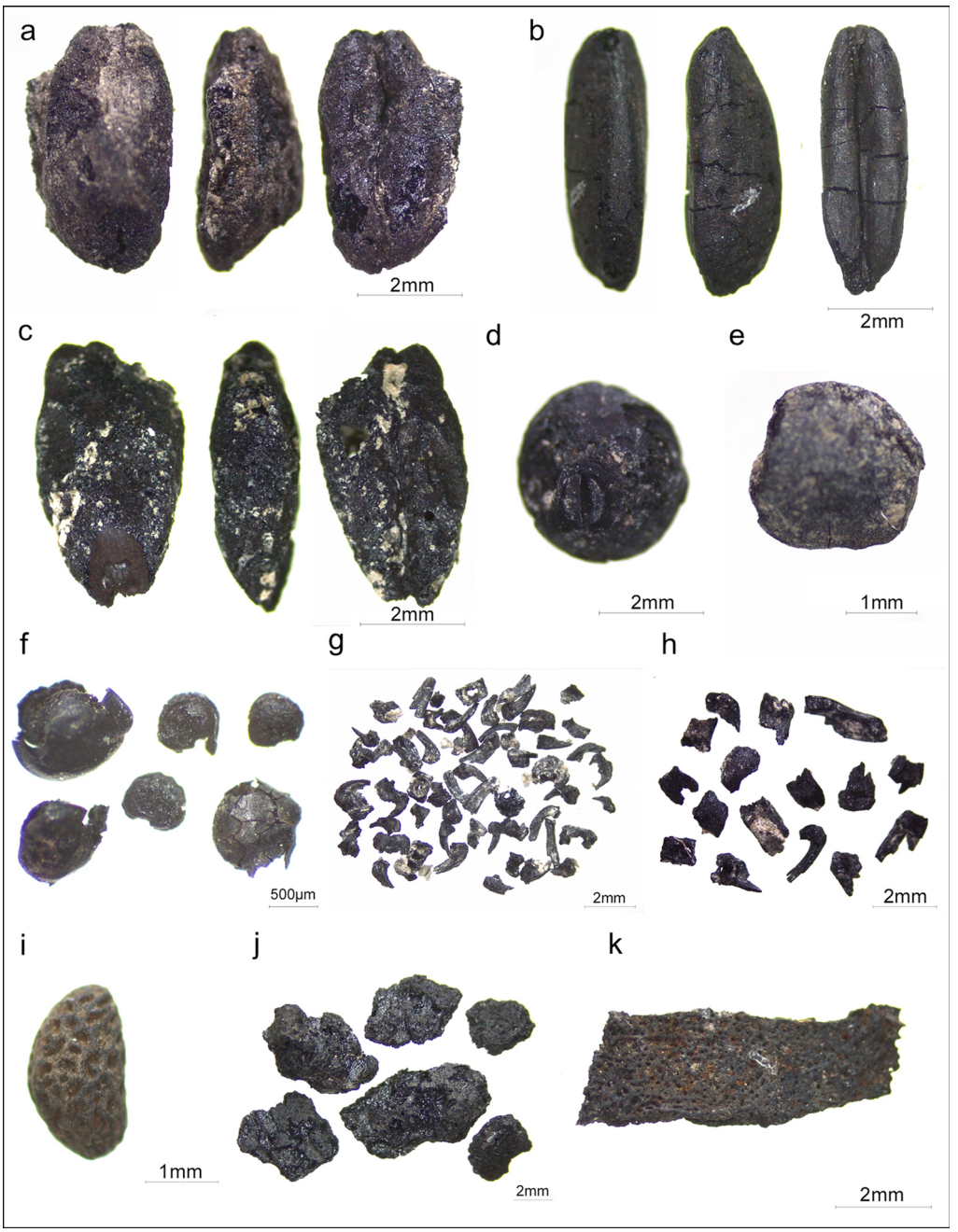

*Figure 3. Archaeobotanical remains found at Vrbjanska Čuka: a) emmer (*Triticum dicoccum*); b) 2-grained einkorn (*T. monococcum*); c) barley (*Hordeum distichon/vulgare*); d) pea (*Pisum sativum*); e) lentil (*Lens culinaris*); f) fat-hen (*Chenopodium album*); g) einkorn (*Triticum monococcum*) glume bases; h) emmer (*Triticum dicoccum*) glume bases; i) bramble (*Rubus fruticosus*); j) amorphous charred object (possible food remains); k) charred food crust (photographs by R. Soteras).*

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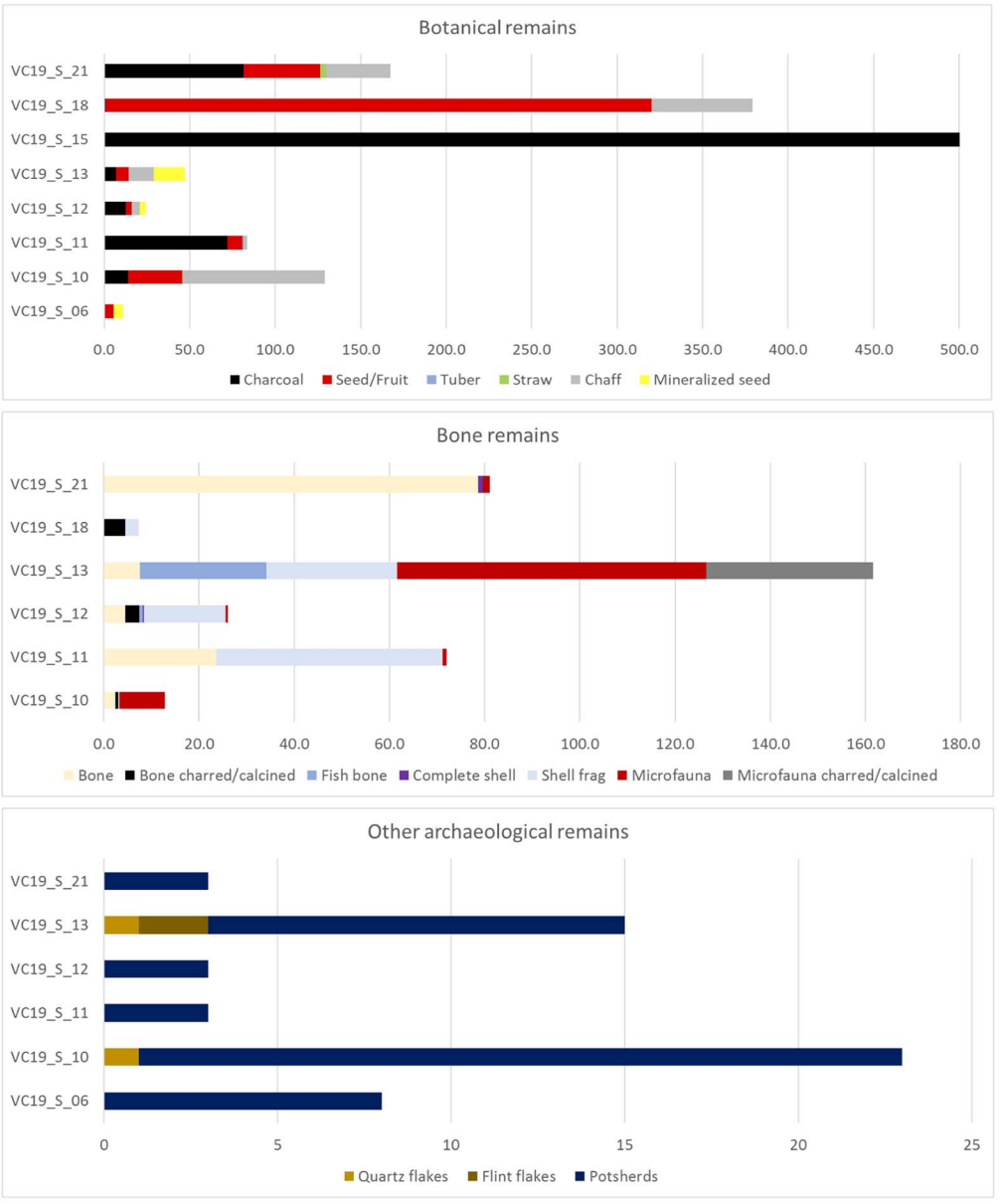

Figure 4. First results obtained from the micro-refuse analysis at Vrbjanska Čuka (graphs by F. Antolín).

whole charred fruits, suggesting that gathering was an important activity, with harvested goods stored within the house.

Preliminary results of the micro-refuse analysis indicate promising trends (Figure 4). Some of the observed patterns might be obvious, as is shown by sample 15, an *in situ* burnt posthole where only charcoal was found. Others are more significant, such as a sample coming from an oven (sample 18), where almost exclusively grains and chaff were recovered. Refuse deposits

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are characterised by a mixture of charcoal, seeds, chaff, bone fragments and potsherds (samples 21, 12 and 11). Sample 13 is indicative of consumption residues (calcined bones, fish remains and the like), while sample 10, with a dominance of chaff remains, might be the result of discarding the by-products of dehusking.

Future perspectives

The investigation of additional sites in Pelagonia Valley and the Ohrid region is envisaged in order to understand better the Neolithisation process and the connections between these regions. Radiocarbon dating of all crop species will be essential to exclude contaminations from younger layers and to reconstruct house cycles.

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