COOKING WITH PLANTS
IN ANCIENT EUROPE AND BEYOND

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Interdisciplinary approaches to the archaeology of plant foods

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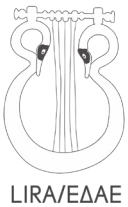

Contents

Chapter 9

The first five millennia of plant food production in the central and western Balkans: archaeobotanical evidence from the Neolithic to the Bronze Age

Dragana Filipović, Djurdja Obradović, Anne de Vareilles

Abstract

This paper takes a long-term perspective and looks at the development of plant food economies from the Neolithic through to the Bronze Age (6300-1000 BC) in the central and western parts of the continental Balkans (southeast Europe), more specifically – the territories of Serbia, *Kosovo[1], and Bosnia and Herzegovina. It does this by overviewing the archaeobotanical evidence of crop growing from sites archaeologically dated to the selected timespan. Farming started in the region with the cultivation of at least six crop species early in the Neolithic. Through time, the range grew steadily as new species were taken into cultivation whilst old ones were maintained. Some crops changed their role over time, from minor to major or vice versa, while the importance of others remained constant. Continuity, diversification and innovation mark the five millennia of farming practice in the region.

Keywords: *central and western Balkans, later prehistory, crops, archaeobotany*

9.1 Introduction

The central-western part of the Balkans is one of the oldest agricultural regions of Europe. Here, arable farming has been continuously practiced from the late 7th mill BC onwards, despite the tumultuous history of the region plagued with wars, large-scale migrations and exodus, and inter-annual scale economic downturns. Even today, agriculture is the major branch of production and is practiced both by smallholders (family run farms) and on an industrial scale. This paper looks at the first five millennia of crop cultivation in the region, from its beginnings in the Neolithic to the start of the Iron Age in the early 1st mill BC. The aim is to highlight changes evident between broad archaeological periods in terms of the cultivated crops and the expansion (or contraction) of their spectrum through time.

1 We adopt the European Commission's view on the disputed territory: "This designation is without prejudice to positions on status and is in line with UNSCR 1244/1999 and the ICJ Opinion on the Kosovo declaration of independence." (https://ec.europa.eu/neighbourhood-enlargement/countries/detailed-country-information/kosovo_en Last accessed 2 April 2021).

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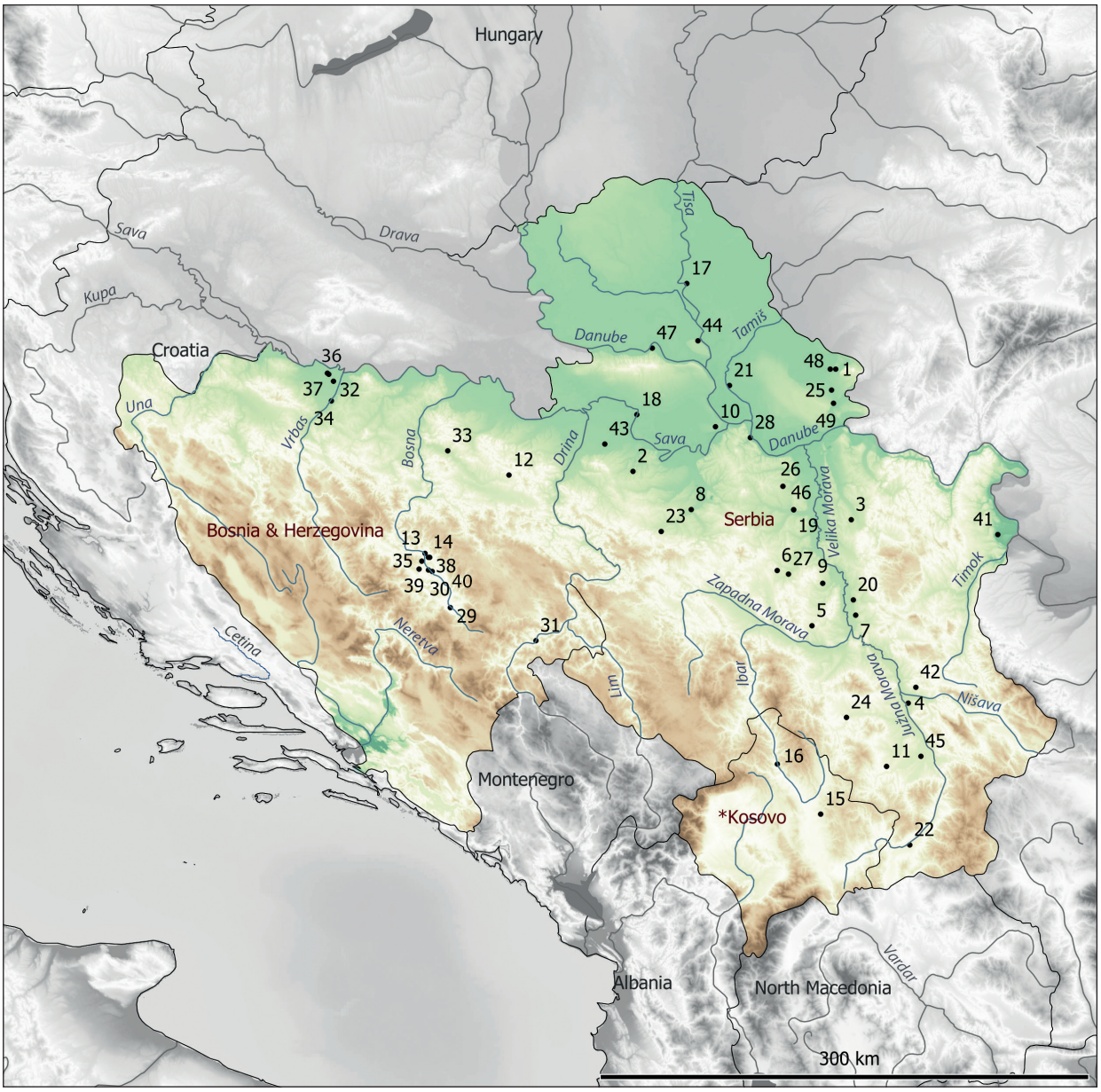

Fig 9.1 Map of the study region showing location of the sites with archaeobotanical data: 1. At 2. Belotić 3. Belovode 4. Bubanj 5. Blagotin 6. Divostin 7. Drenovac 8. Jaričište 1 9. Medjureč 10. Starčevo-Grad 11. Svinjarička Čuka 12. Gornja Tuzla 13. Kakanj 14. Obre I 15. Predionica 16. Valač 17. Bordjoš 18. Gomolava 19. Medvednjak 20. Motel Slatina 21. Opovo 22. Pavlovac-Gumnište 23. Petnica 24. Pločnik 25. Potporanj 26. Selevac 27. Vinča (Kragujevac) 28. Vinča-Belo Brdo 29. Butmir 30. Donje Moštre 31. Jagnjilo 32. Kočićevo 33. Korića Han 34. Kosjerovo 35. Kundruci 36. Laminci Jaružani 37. Laminci Jaružani-Njiva 38. Obre II 39. Okolište 40. Zagrebnice 41. Mokranjske Stene 42. Humska Čuka 43. Šanac-Izba 44. Feudvar 45. Hisar 46. Novačka Ćuprija 47. Petrovaradin 48. Vatin 49. Židovar.

9.2 The study region

In political terms, the "central and western Balkan" region of our interest here denotes the territories of modern-day Serbia, *Kosovo, and Bosnia and Herzegovina (BaH) (Fig. 9.1). Within this region, we consider archaeological sites located approximately between the 42nd and 46th parallel north and 15th and 22nd meridian east of Greenwich. These are the areas where (a) our research in the region has taken place, which ensures familiarity with and direct control of most of the archaeobotanical data; and (b) south-to-north along our study region, the climate changes from sub-Mediterranean to increasingly continental, which may have influenced the range of cultivated crops. In the phase of agricultural spread at

the start of the Neolithic, the south-north environmental gradient in southeast Europe likely required adaptations of the early crops and cultivation practices to the colder and drier conditions compared to those in the Mediterranean (Halstead 1989; Ivanova et al 2018). The selected region is well-placed to capture this transition; however, we do not explore this in detail here, as we do that in a separate study (de Vareilles et al 2022; see also Gaastra et al 2019). Additionally, we look over the political borders and briefly consider the evidence from Montenegro, Albania and North Macedonia.

In geographical terms, our study region encompasses the southern end of the Carpathian Basin/Pannonian Plain (including the south section of the middle Danube), the eastern end of the Dinaric Alps (much of BaH, western Serbia and *Kosovo), the southernmost end of the Carpathians, and north-western ends of the Balkan Mountains (also known as the Stara Planina) and the Rhodopes in eastern Serbia. The region is dissected by numerous rivers, of which the major ones are the Sava, with its many tributaries in BaH and Serbia (e.g. Vrbas, Bosna, Drina, Kolubara), and the (southern section of the middle) Danube, with its key tributaries – the Drava, the Tisa and the Velika Morava. The Sava-Danube line marks the transition between the hilly to mountainous southern part and the predominantly flat northern part of the region. The northern part opens freely to central Europe and its rivers flow southwards. Rivers in the southern part mostly flow northwards, cutting through the mountains and creating basins and valleys, and forming natural communication lines between the Mediterranean (primarily Adriatic and Aegean) and continental sections of the Balkan Peninsula.

9.3 Brief Neolithic to Bronze Age culture-history

The archaeological evidence, of which the level of detail is generally low and quite varied across the region, reflects the past diversity of cultural practices. This evidence is traditionally described in the context of "cultures" differentiated based on the types, shapes and decoration of material remains (principally pottery). We here list the cultures associated with the Neolithic, Eneolithic (Copper Age) and Bronze Age (Tables 9.1-9.2) with a comment on the availability of archaeobotanical data.

9.3.1 Neolithic

Neolithic lifeways began here in the second half of the 7th mill cal BC and were led by relatively small communities designated as the Starčevo culture, which resided here until the second half of the 6th mill BC. Nearly a hundred Starčevo sites have been documented in the region, of which the vast majority are in Serbia and only a few in Kosovo and BaH, largely reflecting the low level of research and reporting, as well as high levels of erosion and destruction in modern times (Garašanin 1979; Srejović 1988; Tasić 1997). Many Starčevo sites were registered solely on the basis of ceramic scatters, eliminating the prospect of archaeobotanical sampling, although plant impressions in ceramics and daub were sometimes noted. Where excavations were possible, in most cases they took place decades ago and, in the absence of adequate expertise, did not include recovery of plant remains. There are, however, several exceptions, along with more recent excavations incorporating archaeobotanical analysis.

Around the mid-6th mill BC, the Starčevo culture underwent change or terminated, and a new phenomenon emerged, known as the Vinča culture (Garašanin 1979), which lasted to around 4500 cal BC (Borić 2009, 2015). At the peak of its development, it extended through the entire central and part of western Balkans, from southernmost Hungary to northern North Macedonia, and from easternmost Croatia and north-eastern BaH to western parts of Transylvania (Garašanin 1979; Chapman 1981; Borić 2015). Excavations of Vinča sites have frequently included archaeobotanical sampling and analysis.

The mid-6th mill BC in central BaH is described as the time when Starčevo was replaced by, or developed into, the Kakanj culture, documented at several sites in the lower-middle course of the Bosna River, including the key site of Obre I, where Kakanj layers sit directly on layers that combine elements of Starčevo and Adriatic-Impresso cultures (Benac 1979). The Butmir culture developed in the west simultaneously to the Vinča culture in the east. Some settlements were excavated long ago – Butmir, for instance, was first excavated at the end of the 19th c – and concentrations of plant remains (in pots) were collected for analysis. Imprints of plant parts on the surface of pots and daub were noted or studied. Recent investigations have included structured archaeobotanical research.

9.3.2 Eneolithic

At the turn of the 6th to 5th mill BC, the first copper smelting took place in Europe, in the context of the Vinča culture, in eastern Serbia (Radivojević et al 2010). Traditionally, the end of Vinča and the last phase of Butmir cultures, at c.4500 cal BC, are taken as the onset of the period termed Copper Age or Eneolithic (Jovanović 1979; Perić 1995; Borić 2009, 2015). The centuries around the mid-5th mill BC witnessed the abandonment of many settlements and, simultaneously, the colonisation of new areas considered by some as agriculturally marginal (Chapman 1990). A host of new cultural traditions were identified as developing across the region (Table 9.1), some starting synchronously with the younger phases of the Neolithic cultures, some derived from these and evolving into new phenomena. The majority of Eneolithic sites were excavated in the period between World War II and the Yugoslav civil wars in the

ENEOLITHIC, ca 4400-2500 BC	
Culture	Distribution in the study region
mid-5th – early 4th mill BC	
Tiszapolgár Bodrogkeresztúr	Higher ground in the Tisa and the Sava River valleys in Serbia (mainly cemeteries registered)
Lasinje	Northern Bosnia, in the low-lying Sava valley
Baden	Northern Bosnia and Vojvodina (along the Sava and its tributaries, and the Danube) and around the Velika Morava confluence
Bubanj-Sălkuța-Krivodol	East and south of the Velika Morava in Serbia, and *Kosovo
4th and first half of 3rd mill BC	
Cernavodă III-Boleráz	Along the Danube and in central and eastern Serbia
Kostolac-Coţofeni	Across much of Serbia and eastern Bosnia
Vučedol	Emerged in northern Croatia and northwestern Serbia (Slavonia and Srem regions), spread to west, east and south, covering the northern and western parts of the study region
Corded Ware and Yamnaya	Sporadic finds across the study region of: corded ceramic ware, horse-head sceptres, burials under mounds, horse remains
References: Tasić 1995; Marijanović 2003; Bulatović et al 2018; Miloglav 2018; Koledin et al 2020	

Table 9.1 Summary of Eneolithic cultures and their distribution in the study region.

1990s, during which archaeobotanical investigations were rarely included in the research. However, in the last couple of decades, excavations of some key sites have integrated archaeobotanical fieldwork and analysis.

9.3.3 Bronze Age

The diversity in material culture of the region grew even further during the 3rd and 2nd mill BC. More cultural traditions existed in the ca 1500 years of the Bronze Age than in the preceding 4000 years. The emergence of so many material culture styles (Table 9.2), with both distinctive and shared characteristics, is a reflection of the intensive interaction between groups within the region as well as between the Mediterranean and central and eastern Europe, with the cross-continental trade routes traversing the central-western Balkans (e.g. Sherratt 1993). Traditionally, the second half of the 3rd mill BC is taken as the time when Bronze Age developments began in the region (Garašanin 1982, 1983a-c). However, the last centuries of the 4th mill BC (the Kostolac-Coţofeni culture) have recently been relegated to the Bronze Age of the central Balkans, in order to align the local chronologies with those used in the neighbouring countries (Bulatović et al 2020). Some settlements were occupied during one phase of the period, or by one cultural group, others for (much) longer and by different cultures (e.g. Feudvar – Falkenstein et al 2016). Investigated Bronze Age sites are generally in a poor state of preservation, particularly those from the early part of the period. The cultural layers are often affected by erosion and modern-day agricultural use

BRONZE AGE, ca 2500-1000 BC	
Culture	Distribution in the study region
mid-3rd – start of 2nd mill BC	
Maros	Banat (Serbia)
(Somogyvár-) Vinkovci	Srem (Serbia), along the Sava in northern Bosnia
Belotić-Bela Crkva	Western Serbia (only cemeteries registered)
Bubanj-Hum III	Central and southern Serbia
Armenochori	Southernmost Serbia
Glasinac	Eastern Bosnia, upper course of the Neretva, Bosna, Vrbas rivers
Cetina	South-eastern Bosnia
2nd mill BC	
Vatin	Vojvodina, central Serbia, northern Bosnia
Transdanubian Encrusted Pottery	Srem, the Sava-Danube confluence
Verbicioara	Eastern Serbia
Dubovac-Žuto Brdo	Along the Danube in eastern Serbia
Tumulus (Hügelgräber)	Bačka and Banat (Serbia)
Paraćin	Middle course of the Velika Morava River and lower course of the Južna Morava River
Bubanj-Hum IV – Ljuljaci	Central and western Serbia
Dinaric	South-western Bosnia
Glasinac	Eastern Bosnia
Urnfield	Northern Bosnia, the Sava-Danube interfluve in Vojvodina, western Serbia
Middle-Bosnian	Central Bosnia, upper and middle course of the Bosnia and Vrbas rivers
Dalmatian	South/south-western Bosnia
Donja Brnjica	Southern and south-western Serbia (the Južna Morava River, Sandžak region), and *Kosovo
Brezjak	Western Serbia
Belegiš II-Gáva	Local Urnfield variant (transition to the Iron Age)
References: Garašanin 1982, 1983a-c; Govedarica 1989; Tasić 2004; Ljuština 2012; Gligorić et al 2016; Bulatović et al 2018, 2020; Bulatović 2020	

Table 9.2 Summary of Bronze Age cultures and their distribution in the study region.

or have been truncated by post-Bronze Age occupations. In the 1980s, archaeobotanical sampling and recovery was conducted at a few Bronze Age settlements in Serbia, and at several others more recently; currently, only a single archaeobotanical sample has been taken in BaH (at the site of Kosjerovo – de Vareilles 2018).

9.4 The archaeobotanical evidence: materials and methods

The number of sites in the region from which archaeobotanical material has been retrieved, analysed and published has increased during the last 15 years (Table 9.3), although it is still low compared to, for

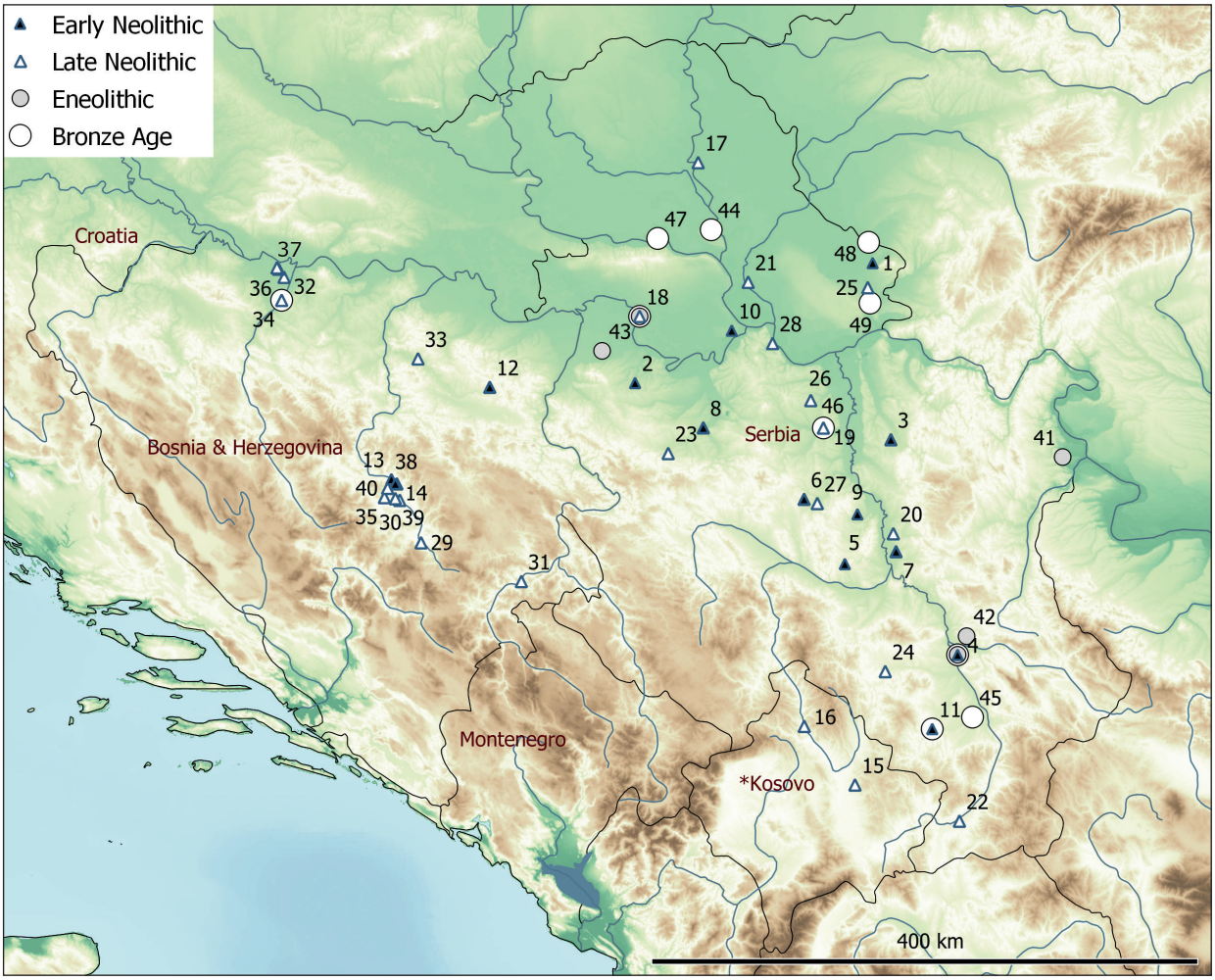

Fig 9.2 Archaeobotanical coverage of the region for the considered periods. For site names see caption for Fig. 9.1.

instance, central-western Europe. The coverage of the area is strikingly uneven (Fig. 9.2), which is dictated by the lack of research, research funds or archaeobotanical expertise.

We note the presence of cultivated taxa based on the archaeobotanical remains (seed/fruit/chaff) and imprints in pottery and daub (Table 9.4). The latter allow us to include more sites in this overview whilst relying on the proven expertise of renowned archaeobotanists Maria Hopf and Jane Renfrew (Hopf 1958, 1967, 1974; Renfrew 1974, 1979). The archaeobotanical remains are predominantly charred; mineralised preservation is occasionally reported.

So far, forty-nine sites in the central and western Balkans have offered sixty-two archaeobotanical datasets dated to the time between ca 6300 and ca 1000 BC. All of the sites are open-air settlements and the majority located in places of modern-day human habitation or agricultural activity. Many were used in or throughout different periods, some up to medieval times, and have a thick, diachronic cultural layer. In these cases, and particularly where the layers from different periods are directly superimposed, there is a possibility that some archaeobotanical remains have moved between the layers/periods due to natural or anthropogenic activities. This has most clearly been proven for the grains of broomcorn millet, through the radiocarbon AMS-dating of the grains themselves. Following the most recent results, demonstrating the presence of broomcorn millet in Europe not earlier than the mid-2nd mill BC (Filipović et al 2020), we have disregarded the records of millet in pre-Bronze Age contexts.

In addition to site formation processes, and the inherently selective preservation through charring (biased towards plant parts exposed to heating, and the hard/sturdy ones), the various methods of archaeobotanical recovery have also shaped the datasets (see Table 9.3). Therefore, we here record only presence/absence of crops, but are fully aware that this can undermine or exaggerate

	SITE	N	E	COUNTRY	Number of samples	Total sample volume (L)	Sampling	Hand-picking	From pollen sample	Imprint	Archaeobotany reference
EARLY NEOLITHIC, ca 6300-5500 BC											
1	At	45.136	21.281	Serbia	10	100	Y				de Vareilles 2018
2	Belotić	44.577	19.718	Serbia				Y			Borojević 1990
3	Belovode	44.311	21.401	Serbia	7	42	Y				Filipović 2021a
4	Bubanj	43.290	21.840	Serbia	5	50	Y				Filipović 2020
5	Blagotin	43.723	21.098	Serbia			Y				Jezik 1998
6	Divostin I	44.030	20.830	Serbia					Y		Grüger and Beug 1988
7	Drenovac	43.782	21.435	Serbia	63	524.3	Y				Obradović 2020
8	Jaričište 1	44.367	20.167	Serbia	7	55	Y				Borojević and Sheridan submitted
9	Medjureč	43.959	21.181	Serbia	10	30	Y				Filipović and Obradović 2013
10	Starčevo-Grad	44.822	20.354	Serbia	3	30	Y			Y	Renfrew 1979; Medović 2011
11	Svinjarička Čuka	42.934	21.673	Serbia	1	24	Y				Horejs et al 2019
12	Gornja Tuzla	44.557	18.762	BaH						Y	Hopf 1967
13	Kakanj	44.125	18.115	BaH	4		Y				Renfrew 1974
14	Obre I	44.103	18.141	BaH	23		Y				Renfrew 1974
LATE NEOLITHIC, ca 5400-4500 BC											
15	Predionica	42.664	21.165	*Kosovo						Y	Hopf 1974
16	Valač	42.947	20.831	*Kosovo				Y			Hopf 1974
17	Belovode	44.311	21.401	Serbia	41	257	Y				Filipović 2021a
18	Bordjoš	45.600	20.133	Serbia			Y				Medović et al 2019
19	Divostin II	44.030	20.830	Serbia					Y		Grüger and Beug 1988
20	Drenovac	43.782	21.435	Serbia	440	3672.5	Y				Obradović 2020
21	Gomolava	44.888	19.748	Serbia	41		Y				van Zeist 2002
22	Jaričište 1	44.367	20.167	Serbia	2	17	Y				Borojević and Sheridan submitted
23	Medvednjak	44.366	20.957	Serbia	6			Y			Renfrew 1979; Obradović 2020
24	Motel Slatina	43.867	21.417	Serbia	2	1.7	Y				Filipović and Obradović 2013
25	Opovo	45.047	20.462	Serbia	267	2916	Y				Borojević 2006
26	Pavlovac-Gumnište	42.489	21.852	Serbia	185	1664.5	Y				Obradović 2020
27	Petnica	44.246	19.936	Serbia				Y			Borojević 1990
28	Pločnik	43.210	21.364	Serbia	68	479	Y				Filipović 2021b
29	Potporanj	45.022	21.249	Serbia	11	110	Y				de Vareilles 2018
30	Selevac	44.495	20.874	Serbia	53		Y	Y			Hopf 1974; McLaren and Hubbard 1990; Obradović 2020
31	Vinča (Kragujevac)	44.010	20.917	Serbia						Y	Hopf 1974
32	Vinča-Belo Brdo	44.762	20.623	Serbia	195	2281.5	Y				Filipović et al 2019
33	Butmir	43.824	18.310	BaH			Y				Renfrew 1979
34	Donje Moštre	44.025	18.170	BaH	47		Y				Kroll 2013b
35	Gornja Tuzla	44.557	18.762	BaH				Y		Y	Hopf 1967,1974
36	Jagnjilo	43.640	18.970	BaH	185		Y				de Vareilles 2018; Kroll submitted
37	Kočićevo	45.070	17.409	BaH	16	90.5	Y				de Vareilles 2018
38	Korića Han	44.690	18.290	BaH	1			Y			de Vareilles 2018
39	Kosjerovo	44.963	17.393	BaH	26	412	Y				de Vareilles 2018
40	Kundruci	44.038	18.069	BaH	29		Y				Kroll 2013b
41	Laminci Jaružani	45.108	17.373	BaH	2	144	Y				de Vareilles 2018
42	Laminci Jaružani-Njiva	45.114	17.362	BaH	2	56	Y				de Vareilles 2018
43	Lisičići	43.700	17.896	BaH						Y	Hopf 1958, 1967
44	Lug (Goražde)	43.643	18.990	BaH				Y		Y	Hopf 1967

Table 9.3 Neolithic, Eneolithic and Bronze Age sites with archaeobotanical data. Note that some sites were occupied in more than one period (* value converted from kg).

	SITE	N	E	COUNTRY	Number of samples	Total sample volume (L)	Sampling	Hand-picking	From pollen sample	Imprint	Archaeobotany reference
45	Obre II	44.103	18.151	BaH	14		Y				Renfrew 1974
46	Okolište	44.033	18.141	BaH	58		Y				Kroll 2013a; Kroll pers. comm.
47	Zagrebnice	44.082	18.090	BaH	28		Y				Kroll 2013b
ENEOLITHIC, ca 4400-2500 BC											
48	Bubanj	43.290	21.840	Serbia			Y				Filipović 2020
49	Gomolava	44.888	19.748	Serbia	10		Y				van Zeist 2002
50	Humska Čuka	43.379	21.899	Serbia	8	80	Y				Bulatović and Filipović 2022
51	Mokranjske Stene	44.229	22.531	Serbia	1	10	Y				Filipović 2015
52	Šanac-Izba	44.727	19.501	Serbia	34	270	Y				Tripković et al 2017
BRONZE AGE, ca 2400-1000 BC											
53	Bubanj	43.290	21.840	Serbia	4	50	Y				Filipović 2020
54	Feudvar	45.290	20.219	Serbia	510		Y				Kroll 2016
55	Gomolava	44.888	19.748	Serbia	1		Y				Medović 2016
56	Hisar	42.991	21.938	Serbia	64	448	Y				Medović 2012
57	Novačka Ćuprija	44.366	20.957	Serbia	38	2900*	Y				Bankoff and Winter 1990
58	Petrovaradin	45.250	19.867	Serbia	7		Y	Y			Medović 2016
59	Svinjarička Čuka	42.934	21.673	Serbia	6	150	Y				Horejs et al 2019
60	Vatin	45.232	21.254	Serbia	21	231	Y	Y			Filipović and Jovanović 2018
61	Židovar	44.950	21.264	Serbia	21	210	Y				Medović 2003
62	Kosjerovo	44.963	17.393	BaH	1	12	Y				de Vareilles 2018

Table 9.3 continued.

TAXON / SITE	Einkorn	Emmer	Einkorn/emmer (where no einkorn or no emmer)	Timopheev's wheat	Free-threshing wheat	Bread wheat	Tetraploid free-threshing wheat	Barley naked	Barley hulled	Barley indeterminate	Flax/linseed	Lentil	Pea	Bitter vetch	Spelt	Rye	Gold-of-pleasure	Opium poppy	*Lallemantia*	Grass pea	Broad bean	Broomcorn millet	Foxtail millet
T. = Triticum; H. = Hordeum	*T. monococcum*	*T. dicoccum*	*T. monococcum* **or** *T. dicoccum*	*T. timopheevii* **s.l.**	*T. durum/ aestivum*	*T. aestivum*	*T. durum*	*H. vulgare nudum*	*H. vulgare vulgare*	*H. vulgare*	*Linum usitatissumum*	*Lens culinaris*	*Pisum sativum*	*Vicia ervilia*	*T. spelta*	*Secale cereale*	*Camelina sativa*	*Papaver somniferum*	*Lallemantia iberica*	*Lathyrus sativus/cicera*	*Vicia faba*	*Panicum miliaceum*	*Setaria italica*
EARLY NEOLITHIC, ca 6300-5500 BC																							
At	x		x	cf.					x														
Belotić					x			cf.	x														
Belovode	x	x		x						x		x	x										
Bubanj		x	x							x													
Blagotin	x	x								x		x											
Divostin I		x																					
Drenovac	x	x							x			x	x										
Jaričište 1		x								x		x	x										
Medjureč	x	x								x		x											
Starčevo-Grad	x	x			imp.					x			imp.										

Table 9.4 Crops recorded at Neolithic, Eneolithic and Bronze Age sites in the region; "imp." = imprints, "cf." = tentative identifications.

TAXON / SITE	Einkorn	Emmer	Einkorn/emmer (where no einkorn or no emmer)	Timopheev's wheat	Free-threshing wheat	Bread wheat	Tetraploid free-threshing wheat	Barley naked	Barley hulled	Barley indeterminate	Flax/linseed	Lentil	Pea	Bitter vetch	Spelt	Rye	Gold-of-pleasure	Opium poppy	*Lallemantia*	Grass pea	Broad bean	Broomcorn millet	Foxtail millet
T. = Triticum; H. = Hordeum	*T. monococcum*	*T. dicoccum*	*T. monococcum* **or** *T. dicoccum*	*T. timopheevii* **s.l.**	*T. durum/ aestivum*	*T. aestivum*	*T. durum*	*H. vulgare nudum*	*H. vulgare vulgare*	*H. vulgare*	*Linum usitatissumum*	*Lens culinaris*	*Pisum sativum*	*Vicia ervilia*	*T. spelta*	*Secale cereale*	*Camelina sativa*	*Papaver somniferum*	*Lallemantia iberica*	*Lathyrus sativus/cicera*	*Vicia faba*	*Panicum miliaceum*	*Setaria italica*
Svinjarička Čuka		x	x	x					x	x													
Gornja Tuzla			imp.																				
Kakanj	x	x			x					x			x										
Obre I	x	x			x							x	x										
Predionica		imp.																					
Valač													x										
LATE NEOLITHIC, ca 5400-4500 BC																							
Belovode	x	x		x	x	x				x	x	x	x	x						x			
Bordjoš	x	x		x						x			x										
Divostin II					x															cf.			
Drenovac	x	x		x	x					x	x	x	x	x									
Gomolava	x	x			x				x		x	x	x										
Jaričište 1		x		x							x												
Medvednjak	x	x				x						x		x									
Motel Slatina	x	x										x											
Opovo	x	x		cf.					x		x	x											
Pavlovac-Gumnište	x	x		x	x				x	x	x	x	x	x						x			
Petnica	x	x						x	x														
Pločnik	x	x		x	x	x	x	x		x	x	x	x	x						x			
Potporanj	x	x		cf.	x							x											
Selevac	x	x							x			x	x										
Vinča (Kragujevac)		imp.																					
Vinča-Belo Brdo	x	x		x	x					x	x	x	x	x									
Butmir	x					x			x			x	x										
DonjeMoštre	x	x			x			x	x	x	x	x	x										
Gornja Tuzla	x	x																					
Jagnjilo	x	x			x			x	x	x	x	x	x	x	cf.					x			
Kočićevo	x	x			x				x	x			x										
Korića Han	x	x						x		x		x				x							
Kosjerovo	x	x							x														
Kundruci	x	x						x		x										x			
Laminci Jaružani	x										x												
Laminci Jaružani-Njiva			x																				
Lisičići	imp.	imp.							imp.	imp.													
Lug (Goražde)	imp.	imp.						x	x	imp.													

Table 9.4 continued.

TAXON / SITE	Einkorn	Emmer	Einkorn/emmer (where no einkorn or no emmer)	Timopheev's wheat	Free-threshing wheat	Bread wheat	Tetraploid free-threshing wheat	Barley naked	Barley hulled	Barley indeterminate	Flax/linseed	Lentil	Pea	Bitter vetch	Spelt	Rye	Gold-of-pleasure	Opium poppy	*Lallemantia*	Grass pea	Broad bean	Broomcorn millet	Foxtail millet
T. = *Triticum*; *H.* = *Hordeum*	*T. monococcum*	*T. dicoccum*	*T. monococcum* **or** *T. dicoccum*	*T. timopheevii* **s.l.**	*T. durum/ aestivum*	*T. aestivum*	*T. durum*	*H. vulgare nudum*	*H. vulgare vulgare*	*H. vulgare*	*Linum usitatissumum*	*Lens culinaris*	*Pisum sativum*	*Vicia ervilia*	*T. spelta*	*Secale cereale*	*Camelina sativa*	*Papaver somniferum*	*Lallemantia iberica*	*Lathyrus sativus/cicera*	*Vicia faba*	*Panicum miliaceum*	*Setaria italica*
Obre II	x	x					x	x	x			x											
Okolište	x	x		cf.		x	x	x	x	x	x	x	x			x							
Zagrebnice	x	x						x	x	x	x				x								
ENEOLITHIC, ca 4400-2500 BC																							
Bubanj	x	x							x	x	x	x	x	x									
Gomolava	x	x				x		x		x	x	x		x									
Humska Čuka	x	x							x	x		x		x	cf.								
Mokranjske Stene	x	x						x		x		x	x										
Šanac-Izba	x	x																					
BRONZE AGE, ca 2500-1000 BC																							
Bubanj	x		x							x						x							
Feudvar	x			x		x		x	x		x	x	x	x	x		x	x	x	x	x	x	x
Gomolava	x			x					x						x						x		
Hisar	x	x			x			x	x		x	x	x	x	x		x		x		x	x	x
Novačka Ćuprija	x	x				x				x		x	x	x								x	
Petrovaradin	x	x				x			x				x										x
Svinjarička Čuka	x	x								x	x	x										x	
Vatin	x	x		x	x				x		x	x	x	x	cf.	x	cf.		x			x	x
Židovar	x	x		x		x			x			x	x	x	x		x		x			x	
Kosjerovo	x		x															x					

Table 9.4 continued.

the relevance of a cultivated resource. However, we adopt this approach here as we are indeed interested specifically in the presence, not importance, of different crop taxa and their spatial distribution in different periods of later prehistory.

Sampling was conducted at the majority of the sites; however, the volume of processed soil is seldom recorded. Some sites are represented only by the material visible to and collected by the excavators or pollen analysts (i.e. recovered without sampling and sieving); at several sites, only impressions were reported. In these cases (i.e. where there was no sampling), the datasets are particularly unlikely to represent the full suite of cultivated plant foods. Certainly, for these sites, and possibly for others too, the noted taxa *presence* does not necessarily imply taxa *absence*. Nevertheless, for each of the periods included, at least some if not all of the sites have been subjected to archaeobotanical sampling and careful recovery (in many cases performed by us), thus offering a more representative picture of plant use per period. We, therefore, describe the data by archaeological period, not individual sites. This also mitigates the bias incurred from the different archaeological contexts sampled at different sites. Namely, although the contexts included are houses, pits, fire installations, storage facilities and occupation layers, not all of these are represented among the archaeobotanical samples from each site. Moreover, even the comparison between periods is done with caution, since the number of sites and samples per period varies, as does the geographical coverage.

SITE	Dated material (plant = charred)	Laboratory code	Radiocarbon age (BP)
Blagotin (pit dwelling [ZM-zemunica] No.7)	Red deer antler	OxA-8608	7480 ± 55
	Human infant bone	OxA-8609	7270 ± 50
	Bone perforator	OxA-8760	7230 ± 50
Medjureč (trench 1, square 1)	*Ovis/Capra*, pelvis sin.	BRAMS-2250	7313 ± 29
	Bos taurus, intermedium	BRAMS-2254	7266 ± 28
	Bos taurus, Ph II	BRAMS-2248	7225 ± 31
	Bos taurus, ulnare dext.	BRAMS-2249	7225 ± 31
	Bos sp., scapula	BRAMS-2247	7212 ± 31
Medjureč (trench 1, square 2)	*Bos taurus*, vertebra lumbal	BRAMS-2251	7316 ± 29
	Bos taurus, mandibular sin.	BRAMS-2252	7208 ± 29
Medjureč (trench 1, square 4)	*Ovis/Capra*, pelvis dext.	BRAMS-2253	7308 ± 29
Svinjarička Čuka (SU 26, Starčevo context)	1 (hulled) barley grain	MAMS-40136	6734 ± 25
Svinjarička Čuka (SU 22, Starčevo context)	1 emmer grain	MAMS-40137	6611 ± 24
	1 barley grain	MAMS-40138	6597 ± 24
At (Starčevo context, bottom of pit-dwelling)	charcoal	COL-3247	6868
	Bos taurus, metapodial	OxA-8594	6615 ± 70
Zagrebnice (context 10390, feature 10081)	1 emmer grain	KIA-45627	6565 ± 30
Zagrebnice (context 34060, feature 34002)	flax seeds	KIA-45630	5895 ± 35
Pločnik (horizon 5, feature 39, NE room)	1 cf. einkorn grain	MAMS-22093	6145 ± 26
Obre I (occupation phase B, start of Kakanj culture)	*Bos taurus*	OxA-23291	6665 ± 35
	Bos taurus	OxA-23292	6432 ± 35
	charcoal	UCLA-1605 F	6430 ± 60
	Sus scrofa	OxA-23290	6421 ± 35
	Bos taurus	OxA-23289	6390 ± 34
Jaričište 1 (sector 66, quad. M12, trench 39)	1 Cornelian cherry (*Cornus mas*) fruit	NOSAMS OS-78624	6660 ± 35
Jaričište 1 (sector 54-55, quad. U25, trench 57)	12 flax seeds	NOSAMS OS-78623	6260 ± 35
Belovode (Starčevo horizon)	charcoal	MAMS-22078	6422 ± 23
Drenovac (burnt Starčevo structure)	Medium/large mammal long bone/ metapodial	BRAMS-2245	7133 ± 27

Table 9.5 Details on the radiocarbon-dated finds of crops or associated materials from the Neolithic sites in the region.

Where available, we highlight the radiocarbon-dated earliest occurrences of crops, either the dates obtained directly on the plant remains or on material with which they were associated (i.e. found in the same archaeological feature or layer). The details for these dates are given in Table 9.5.

9.5 Results and discussion: The first five millennia of plant food production in the central and western Balkans

9.5.1 Neolithic

In the central and western Balkans, no less than nineteen crop species were associated with prehistoric agriculture (Table 9.4). At least six were cultivated from the earliest days of food production, the Early Neolithic, and continued to be cultivated throughout the period covered here (Fig. 9.3). The initial, diverse suite of crops persisted for five millennia. Most of these "first" crops co-occur at many of the sites, making the regional picture of diversity discernible also at the local scale. They may have been cultivated, or at least consumed already in the final centuries of the 7th mill BC.

The radiocarbon dates (Table 9.5) obtained directly on grains/seeds, or relating to the deposits containing crop remains, suggest that hulled wheats (einkorn, emmer and Timopheev's wheat) and barley (hulled type) were present in the region at the end of the 7th and very early in the 6th mill BC. Einkorn grains were discovered in a Starčevo pit dwelling at Blagotin, from which human and animal remains were radiocarbon dated to between 6440 and 5990 cal BC (Whittle et al 2002); recent dates on faunal remains from Blagotin are somewhat later (Porčić et al 2020, SI 2). The site of Medjureč has only an Early Neolithic occupation, for which the radiocarbon dates on animal bones suggest a start after around 6200 cal BC (Porčić et

Published calibrated date	Comment	Source
6440 BC (95.4%) 6230 BC	Einkorn and emmer grain discovered in the same Starčevo pit-dwelling	Jezik 1998, Table 4; Whittle et al 2002
6230 BC (95.4%) 6020 BC		
6220 BC (95.4%) 5990 BC		
	Archaeobotanical samples taken from these excavation units yielded hulled wheat and barley grains	Filipović and Obradović 2013; Porčić et al 2020
6232 BC (95.4%) 6087 BC		
5706 BC (95.4%) 5620 BC	Timopheev's wheat chaff and emmer grain found in the same sample	Horejs et al 2019
5616 BC (95.4%) 5494 BC		
5613 BC (95.4%) 5486 BC		
5842 BC (95.4%) 5668 BC	A cf. Timopheev's wheat grain found in the same Starčevo pit-dwelling	Whittle et al 2002; Chu et al 2016; de Vareilles 2018
5607 BC (95.4%) 5477 BC	From Butmir culture layer but Kakanj culture pottery also found	Müller-Scheeßel and Hofmann 2013; Vander Linden et al 2014
	From Butmir culture horizon	Müller-Scheeßel and Hofmann 2013
5207 BC (95.4%) 5009 BC	Tetraploid free-threshing wheat chaff concentration found in the oven fill from which the dated grain derived	Filipović 2021b; Marić et al 2021
Obre IB is bounded between 5666-5536 cal BC (68.2%) and 5410-5278 cal BC (68.2%)	Emmer and compact free-threshing wheat grains found in the layer attributed to this phase (in trench VI, level 5)	Gimbutas 1974; Renfrew 1974, 47; Vander Linden et al 2014
5639 BC (95.4%) 5523 BC	Lentil and pea found in the Starčevo grave from which the fruit derived	Marić 2013; Borojević and Sheridan submitted
5318 BC (95.4%) 5206 BC	The seeds were found in a Vinča culture pit	
Modelled start of Starčevo horizon 5648-5338 cal BC (2σ)	Lentil and pea documented in the Starčevo layer	Filipović 2021a; Marić et al 2021
	Concentration of lentils and cache of peas found in the same context	Filipović et al 2018; Obradović 2020; Porčić et al 2020

al 2020). The small collection (ca 50) of hulled wheat and barley grains recovered are, therefore, not older than the last centuries of the 7th mill BC. The starch and phytolith evidence preserved in dental calculus of individuals buried at Early Neolithic sites in the Danube Gorges shows that cereals were here consumed from about 6000 cal BC (Jovanović et al 2021).

A Starčevo context at Svinjarička Čuka yielded a (likely hulled) barley grain directly dated to 5706-5620 cal BC. Timopheev's wheat chaff and emmer grains were found in the same sample. Further north, at At, a tentatively identified Timopheev's wheat grain came from a Starčevo context dated to 5842-5668 cal BC. This species is a relatively recent discovery in archaeobotany (Jones et al 2000) so its apparent absence at sites analysed prior to its recognition must be revisited. One emmer grain from Svinjarička Čuka was directly dated to 5616-5494 cal BC and one from Zagrebnice to 5607-5477 cal BC (Müller-Scheeßel and Hofmann 2013). Belotić was described as a late Starčevo site but the grains derived from an unclear location (perhaps from mixed fill of a pit) and their association with the context (and the period) is unconfirmed (Borojević 1990, 74).

One or more free-threshing wheat species were also a component of the basic crop suite, though perhaps not from the outset. In Serbia, first records of free-threshing wheat could be the four bread wheat grains reported for Belotić and the imprint of grain in pottery at Starčevo-Grad, but both their age and identification are questionable. Earliest secure records of free-threshing wheat from Serbia are those from the Late Neolithic/Vinča culture site of Pločnik. Here, a tetraploid-type chaff concentration was found in an oven fill dated to 5207-5009 cal BC (Filipović 2021b; Marić et al 2021). In BaH, Renfrew (1974) discovered small amounts of *Triticum compactum* (club wheat) at Obre I (trench VI, level 5) and Kakanj (trench II, level 6). At Obre I, the layer is attributed to the site-phase B, ca 5600-5400 cal BC (Gimbutas 1974), or, modelled using new and old radiocarbon dates, from 5666-5536 cal BC to 5410-5278 cal BC (Vander Linden et

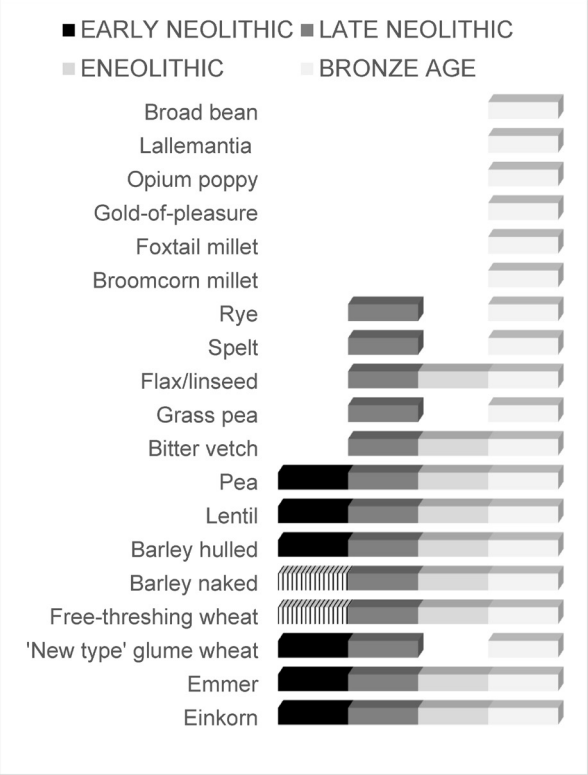

Fig. 9.3 Diachronic development of the crop spectrum in the study region (pattern fill denotes unconfirmed identification or period).

Fig 9.4 Percentage ubiquity of crop types in different periods based on the sites where archaeobotanical sampling was employed.

al 2014). Obre IB is associated with the first phase of the Kakanj culture. Free-threshing wheat was also found at other Late Neolithic sites in the region, including both tetraploid and hexaploid species.

Pulses were a part of the basic crop spectrum from the start. Lentil and pea from Jaričište 1 came from a Starčevo grave from which Cornelian cherry (*Cornus mas*) fruit stone fragments were dated to 5639-5523 cal BC (Marić 2013; Borojević and Sheridan submitted). They were also present in the Starčevo layer at Belovode placed in the period 5648-5338 cal BC (Marić et al 2021). Most prominently, concentrations of lentils and peas, likely to have been stored separately, were discovered in a burnt Starčevo structure at Drenovac (Filipović et al 2018); animal bone from this context was dated to the end of the 7th/start of the 6th mill BC (Porčić et al 2020). These are unique finds for the Early Neolithic in the region, as no other storage deposits of pulses, or crops in general, have been found. Renfrew (1974) notes a "significant" presence of emmer at Kakanj but does neither state the amount/density of the find (i.e. if concentration) nor the approximate age of the finds (based on the site's occupation phase), so they need not be Early Neolithic (phase Kakanj II is Late Neolithic – cf. Gimbutas 1974).

It seems that the basic crop suite was introduced at a similar time across the central and western Balkans, with the possible exception of free-threshing wheat, which looks like it reached central Bosnia some time before Serbia, perhaps taking the route along the Adriatic coast (Orton et al 2016; Vander Linden et al 2021) and then north into the continental zone. In addition to the wider distribution of free-threshing wheat from the second half of the 6th mill BC, some new crops arrived or began to be used with the emergence of the Vinča and Butmir cultures.

One of these is flax/linseed. At Jaričište 1, the seeds from a Vinča pit were dated to 5318-5206 cal BC (Marić

2013; Borojević and Sheridan submitted). Flax normally occurs in low numbers, but a deposit from a late Vinča house at Vinča-Belo Brdo contained more than 400 seeds and a sample from Pavlovac had over 50 seeds. Remains of textile and cord made of flax fibres were discovered at Opovo (Tringham et al 1992, 378) and impressions of flax fibres were recognised on pottery from Vinča (Ninčić 2016). Bitter vetch was another addition and, apparently, more common in the central Balkans, where in some cases it outnumbers other pulses. In a burnt house at Vinča-Belo Brdo, a concentration of about 1400 seeds was encountered, remaining from a bitter vetch store. Grass pea has only been recorded at a few sites and in minute quantities (a maximum of four at Belovode), perhaps because it was not as important as other pulses, or not recognised/considered a crop in its own right. Spelt wheat and rye likely had a similar "non-cultivation" status, as few of their remains have been discovered, all in BaH (in case of spelt, glume bases were reported for the two sites, offering a more secure basis for spelt identification than grains). In Serbia, only a wild form of rye is registered, from the Vinča culture layer at Gomolava.

In addition to hulled barley, naked barley is found at Late Neolithic sites; both types occur across the region but more frequently in BaH. Moreover, although generally present in small quantities, even on extensively sampled sites (e.g. only 8 grains at Drenovac), barley is more abundant in BaH. At Korića Han, over 160 naked barley grains were found within a concentration of cereals dominated by einkorn. The greater visibility of barley in the western Balkans echoes the increase in barley cultivation seen at this time (Late Neolithic) along the Adriatic coast, perhaps because it could be grown on the local, thin karstic soils (de Vareilles 2018).

9.5.2 Eneolithic and Bronze Age

Eneolithic evidence is available only for the eastern portion of the study region (Serbia). It is further limited by the small number of sites and the low number of remains per site (Bulatović and Filipović 2022). The Eneolithic layer at Gomolava is an exception, as it yielded almost 4000 crop remains, though the range of crops is comparable to that from other sites. Just like in the Neolithic, there may have been differences between the sites or successive phases of the period, perhaps reflecting changing roles of or interests in certain crops. At Bubanj, where early, middle and late Eneolithic phases were documented, a tentative observation is that emmer becomes less and lentil more frequent through time, whereas flax/linseed is present only in the early phase. At Gomolava, einkorn and naked barley are much more prominent than all the other crops. The lack or low presence of Timopheev's, spelt and free-threshing wheats could be due to the limited datasets or low identification potential, though their genuine absence from the suite of cultivars of this period cannot be excluded.

Apparently, the rise of many new cultural traditions during the Eneolithic did not add any new crops to the spectrum known from the Late Neolithic. If anything, some crops may have been (gradually) abandoned or forgotten. This is in opposition to the succeeding period – the Bronze Age. Of the ten available Bronze Age site-archives, nine come from Serbia, hence the observations apply mainly to the eastern part of the study region. Here, the great cultural diversity of the period finds strong parallels in the diverse choice of cultivars. This is consonant with the evidence of Bronze Age diversification and innovations in plant economies at the continental scale (Harding 1989; Behre 1998; Stika and Heiss 2013).

Besides the full Late Neolithic suite, the Bronze Age crop spectrum also included species that only sporadically occurred in previous periods (spelt wheat, rye and grass pea), as well as several new ones: gold-of-pleasure, *Lallemantia*, opium poppy, broomcorn millet, foxtail millet and broad bean. Much of this assortment is visible first in the early 2nd mill BC, in the Vatin culture contexts at the archaeobotanically richest and, so far, best-documented site of the region – Feudvar – from which first finds of gold-of-pleasure and *Lallemantia* were recovered, and in large quantities (Kroll 2016). Samples from the later occupation of this site, associated with the Belegiš II-Gáva culture, yielded mass finds of broomcorn millet. By the last few centuries of the 2nd mill BC, the Bronze Age crop suite included nineteen species of cereals, pulses and oil/spice/fibre plants.

In sum, both the choice of crops and the degree of their use across the region changed over time. Considering only the sites with archaeobotanical sampling, Fig. 9.4 summarises the frequency of occurrence of crops at these sites. The temporal trends may reflect fluctuating importance of different crops, though the uneven regional coverage, the low number of sites and the small size of the datasets call for caution and refraining from definite conclusions. Einkorn becomes more frequent through time; emmer displays the opposite tendency, particularly in the Bronze Age. Barley is initially widespread (though seemingly more common in the west), then dips slightly until the Bronze Age, during which hulled was more prominent than the naked variety. Free-threshing wheat is frequent in times of an expanding crop spectrum. Lentil, pea and bitter vetch occur at the majority of sites, with lentil found at more Eneolithic sites than the other two pulse species. The presence of grass pea and rye is low throughout, while spelt wheat sees an increase in frequency in the Bronze Age. Of the new crops introduced during the course of the Bronze Age, broomcorn millet is found at the majority of sites, though never at more sites than the core, original crops.

Fig. 9.5 Map of the region considered, showing location of the Neolithic to Bronze Age sites with archaeobotanical data: 1. Vrbička cave 2. Vashtëmi 3. Maliq 4. Sovjan 5. Vršnik 6. Anza 7. Tumba Madžari 8. Vrbjanska Čuka 9. Veluška Tumba.

9.6 Crops at prehistoric sites in Montenegro, Albania and North Macedonia

Whereas for this overview we remained within the political borders of our study area, the broad geographical zones we covered extend beyond these borders and into the surrounding regions. More specifically, the Sava and the Danube plains in the north are parts of the Pannonian Basin, the largest such in Europe. The Dinaric Alps in the west extend all the way along the eastern Adriatic coast and meet the Rodopes in the east. Here, the territories of Montenegro, Albania and North Macedonia belong to the northern (sub-)Mediterranean zone (Fig. 9.5). The archaeobotanical evidence from these regions could help better understand the nature of the spread of crops and crop cultivation practices, particularly in the context of the south-north (maritime-continental) bioclimatic gradient (see Ivanova et al 2018). However, there is currently very limited archaeobotanical information for these countries, unlike, for instance, for the central and north-eastern sections of the Adriatic coast (southern Croatia), where recent archaeobotanical research has enabled detailed reconstruction of prehistoric plant economies (e.g. Reed 2015, 2017).

In Montenegro, data on plant remains are currently available for only one site, and this is Vrbička cave, located 60 km inland from the Adriatic Sea. The cave was used during different periods of prehistory (Borić et al 2019). Only the layer that contained fragments of Early Neolithic Impressed Ware yielded crop remains, and these were two barley grains.

Several prehistoric sites in Albania have been sampled for archaeobotanical remains. With the exception of the Iron Age site of Grunas (Galaty et al 2013), situated in the northern mountainous area, other analysed sites are located in the south-eastern part of the country, in the similarly mountainous Korçë Basin west of the Prespa Lake (in the Maliq Lake area). They are, therefore, culturally akin to the traditions documented in continental Greece and North Macedonia. For instance, the pottery from the Early Neolithic site of Vashtëmi shows elements of the Proto-Sesklo/Sesklo style, characteristic of northern Greece. Systematic sampling and water-sieving at this site resulted in the recovery of the remains of einkorn, hulled barley, lentil, pea and grass pea. Radiocarbon dates on charcoal and cereal grains from an intact pit fill fall in the time around 6400 cal BC (Allen et al 2014; Allen 2017). At the nearby site of Maliq, a similar set of crops was identified in the Late Neolithic layers, with the addition of emmer and bitter vetch (Xhuveli and Schultze-Motel 1995).

Sites in the Korçë Basin were first excavated in the 1960s and showed that, here, the lakesides and wetland environments were occupied and exploited from prehistory; little archaeobotanical data have been made available, however. The region has in recent decades attracted attention of scholars from outside Albania and high-resolution archaeological, geomorphological and palaeoenvironmental investigations are underway (e.g. Fouache et al 2001, 2010; Allen et al 2014; Maczkowski et al 2021). Of note are the archaeobotanical results from the Bronze Age layers at the site of Sovjan, which show the presence of hulled barley, einkorn, emmer, free-threshing and spelt wheat, broomcorn and foxtail millet, rye, lentil, pea, bitter vetch, broad bean, flax and poppy (Allen 2002; Forste 2012).

Initial archaeobotanical analyses of the prehistoric material from North Macedonia were carried out in the 1960-70s for two Early Neolithic sites of the Anzabegovo-Vršnik cultural complex in the Vardar River valley: Vršnik (Hopf 1961) and Anza (also known as Anzabegovo or Barutnica) (Renfrew 1976, 1979). They yielded the remains of einkorn, emmer and free-threshing wheat, barley, lentil and pea; many of these crops were also present in the Late Neolithic layers at Anza. Recent archaeobotanical work at the 6th mill BC site of Tumba Madžari in the Skopje Basin identified emmer, naked barley, grass pea and possibly pea, and a "cache" of bitter vetch seeds within a child burial (Stojanova-Kanzurova and Rujak 2013, 71).

Most recently, archaeobotanical research has been incorporated in the archaeological excavations at two Early Neolithic sites in the Pelagonia Valley, in the western part of North Macedonia – Vrbjanska Čuka and Veluška Tumba (Antolin et al 2020). The crop spectrum recorded is comparable to that from other broadly contemporary sites in the country and includes hulled and naked barley, emmer, einkorn, lentil, pea and bitter vetch.

9.7 Conclusion

The continental part of the Balkan Peninsula is one of the earliest farming regions in Europe; its archaeobotanical evidence thus offers a particularly deep-time perspective of the plant food production on the continent. This paper focuses on the first five millennia of this activity – from the Neolithic to the end of the Bronze Age – in the central and western parts of the peninsula. The first period of food production in the region, the Early Neolithic, was characterised by the cultivation of a core set of crops which were to remain in use throughout prehistory. In the Late Neolithic, additional crops were introduced, broadening and diversifying the choice of cultivars. During the Eneolithic, the Neolithic crop suite may have contracted since evidence is lacking for some of the species, but this may be due to the limited dataset. A "boom" in the crop spectrum is evident during the Bronze Age, which also saw a re-evaluation of the existing suite; some major crops declined in importance whilst previously minor

ones appear to have become more common. Continuity, diversification and innovation mark the five millennia of food production in the region.

Thanks to its geographical position, the region served as conduit for the advance of agriculture and other Neolithic practices towards central Europe. The pace and nature of this advance were determined both by cultural and natural factors and would likely have resulted in differences between early agricultural niches in the range of plant foods produced and the degree of reliance on individual or groups of crops. In our overview, inter-regional variation is apparent in the absence of grass pea in the continental zone during the Early Neolithic – a time when it seems to have been present in the sub-Mediterranean zone (e.g. at Vashtëmi). In that period too, free-threshing wheat emerged in the western Balkans but was seemingly not yet established in the central part of the peninsula. In the Late Neolithic, barley may have been more favoured in, and/or better suited to, the coastal and inland Adriatic zone. Intra-regional variation may be visible in the changeable crop spectrum when comparing Late Neolithic sites. However, a more nuanced view into these possible differences in food production observed at a regional level demands larger, systematically produced and temporally better framed datasets from under-researched parts of the region.

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