

## CHAPTER 41

# Paleoethnobotanical study of Early Bronze II in the Upper Stryama Valley ( Dubene – Sarovka IIB)

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### Introduction

The Early Bronze Age site of Dubene-Sarovka gives the opportunity to study the development and changes in the agricultural economy during the later fourth and the first half of the third millennium BC in Southeast Europe. During this period some fluctuations in the climate are recorded (Popova & Bozlilova 1997; Nikolova et al 1999; Kenderova 2000) making the study of the vegetation and agriculture of Dubene very interesting. The location of the site in the Northwestern part of Thrace (Karlovo Hollow), i.e. in the middle of the Balkans allows observing the connections between Southwest Bulgaria and Thrace on the one hand, and between Thrace and North Bulgaria, on the other hand. The following study constitutes the first archaeobotanical analysis of the Dubene-Sarovka site. It has the aim to record the cultivated, gathered and other used plants (for medical purposes, dyeing, materials for building etc.) in the area of the Upper Stryama basin. Furthermore it aims at recording the wild vegetation and at comparing Dubene-Sarovka with the other sites from the same period, which have archaeobotanically studied.

### Geographical and archaeological setting

Dubene-Sarovka lies about 10 km south west to the town of Karlovo. The site is located between the mountain chains of the Balkan Mountains and the Sredna Gora Mountains. The microclimate of this valley (protected from the north-east winds) is very favourable for cultivation of some Mediterranean crop plants, which usually grow only in the southernmost parts of Bulgaria. It is the only place in Bulgaria where oil roses are cultivated. The climate is continental with Mediterranean influence, the precipitation per year is about 680 mm, the mean year temperature is 21,4 °C (Georgiev 1994). The potential natural vegetation are oak forests, which nowadays are strong degraded or replaced by agricultural areas.

In the surrounding region there is evidence of human occupation since the Neolithic period (Nikolova 2000). According to the preliminary archaeological studies the occupation in Dabene-Sarovka started in the Late Chalcolithic and continued again in the Early Bronze Age (Nikolova, Zaharieva1994). The Early Bronze layers are divided into three stages (Nikolova et al 1999). The archaeobotanical material presented in this communication comes from the second stage (Early Bronze II, Tab. 1.).

<b>Smple №</b>	<b>Quadrant</b>	<b>Depth [m]</b>	<b>Context</b>	<b>Volume [l]</b>
Dab96/1	F-16	0,95-1,00	building, occupation layer IIb	12
Dab96/2	F-15	0,95-1,00	building, oven	10
Dab96/3	I-15/16	0,75-0,80	western part of building	10
Dab96/4	I-19	0,75-0,80	building, floor	10
Dab96/5	E-14	0,85-0,94	occupation layer I	10
Dab96/6	E-16	0,65-0,70	occupation layer I	12
Dab96/8	G-14	0,76-0,98		10
Dab96/10	F-17	0,95-1,00		10
Dab96/13	O-13	1,60-1,65	building, oven	12
Dab96/14	P-13	1,39-1,45		20
Dab96/16	F-16	1,00-1,05	building, in vessel	5
Dab96/18	M-14	1,10-1,16	building, floor	20
Dab96/20	L-19	0,85-0,90		10
Dab96/21	F-19	0,90-1,00		10
Dab96/23	E-19	0,90-1,00	occupation layer II	12
Dab96/26	E-16	1,08-1,14	building, floor	10
Dab96/27	M-15	1,06-1,12	building with vessels	8
Dab96/28	E-14	0,65-0,70		8
Dab96/29	P-13	0,90-1,07	building, floor	20
Dab96/30	F-16	1,02-1,09	building	10
Dab96/31	I-15/16	0,75-0,80	western part of building	20

Tab.1. The archaeological context of the studied archaeobotanical samples.

### **Methods and materials**

During the summer of 1996 about 30 samples were collected by flotation at the site of Dubene-Sarovka. Many of them come from houses - their floors, ovens etc.; and about 5 samples originate from a storage found near Apses House No.1. The soil volume of each sample was about 10-20 l and manual flotation with sieves of 0,5 and 0,16 mm was applied. Because of the dry preservation conditions in the area the obtained plant material is only carbonized. Except for the samples from the storages the concentration of the charred plant remains is about 7 determinable units per liter flotation soil.

The material was analyzed under binocular with magnification up to 40x, specialized literature (Beijerinck 1976, Dobrohotov 1959, Jacomet et al. 1989) and the reference collections of Sofia University "St. Kliment Ohridsky", Bulgaria and Lower Saxony Institute for Coastal Historical Studies, Germany were used to confirm the plant determinations.

### **Results**

In almost all of the samples hulled wheat, emmer (*Triticum dicoccum*, Fig. 1a and 2a) and einkorn (*T. monococcum*), are found. Considering the storage and the other samples it seems the emmer prevailed in the studied levels of Dubene-Sarovka (Tab. 2)

Near the apses building from IIB2 phase a big quantity of well-preserved cereal crops in carbonized state were documented. The studied storage samples (Tab. 2) presume cultivation of emmer and hulled barley (*Hordeum vulgare* L. var. *vulgare*). Among the emmer storage there were small quantities of einkorn (*T. monococcum* L.) and spelt wheat (*T. spelta* L. Fig. 1b and 2b), which obviously grew together with the emmer. Usually in this period the emmer and einkorn were sown together (Popova & Pavlova 1994) as well as in the prehistoric period as whole (Lisitsina & Filipovich 1980).

One comparison of the grains and spikelets forks of emmer and spelt is presented on Fig. 1 and 2. The spikelet bases of spelt (Fig. 2b) are a sure proof for this kind of wheat. The spelt found in Dubene is a crop plant, which occurs in small quantities in South-eastern Europe since the Bronze Age (Kroll 1983). In Bulgaria the spelt wheat was documented in the Bronze Age layers at the sites of Junazite, Djadovo and Nova Zagora (Popova 1995).

The most numerous and frequent weeds in the wheat storage are the typical winter crops: brome grass (*Bromus arvensis*-type), drooping brome (*B. tectorum*-type) and black bindweed (*Polygonum convolvulus*). Other probable weeds, which occur in the 5 storage samples are nipplewort (*Lapsana communis*), rough meadow grass (*Poa pratensis/trivialis*), bedstraw (*Galium* sp.), bristle-grass (*Setaria verticillata/viridis*) etc. The last plant species was found in Eserovo, Varna Lake (Tschakalova & Bozilova 1984) as a storage bundle of whole plants – maybe collected and used as food or fodder.

The pulses are present in small quantities in a few of the samples. Only the lentil (*Lens culinaris*) was found in about the 50% of the samples. In Tell Junacite (Arnaudov 1941, Popova & Pavlova 1994) the grass pea (*Lathyrus sativus*) is widely recorded, whereas it was not available in the studied from Dabene samples. This together with the small quantities of found pulses could be explained with the preservation condition and the small number of studied samples.

Flax was found in five samples. Because of the high oil content, the flax seeds are rarely preserved in carbonized state and usually are not so often presented in the archeobotanical record. In one of the samples good determinable seeds of cultivated flax (*Linum usitatissimum*) are present in form of seeds baked together. In some of the samples there are also very badly preserved flax capsules. The last are significantly smaller than is typical for *L. usitatissimum*.

Rather frequent in the studied archaeological contexts is the cornelian cherry (*Cornus mas*). Its stones as well as this of the plums (*Prunus* sp.) are preserved only in fragmented state.

The oak acorns very common in the Bronze Age of Bulgaria, are available in the samples of Dubene-Sarovka with some cupula fragments.

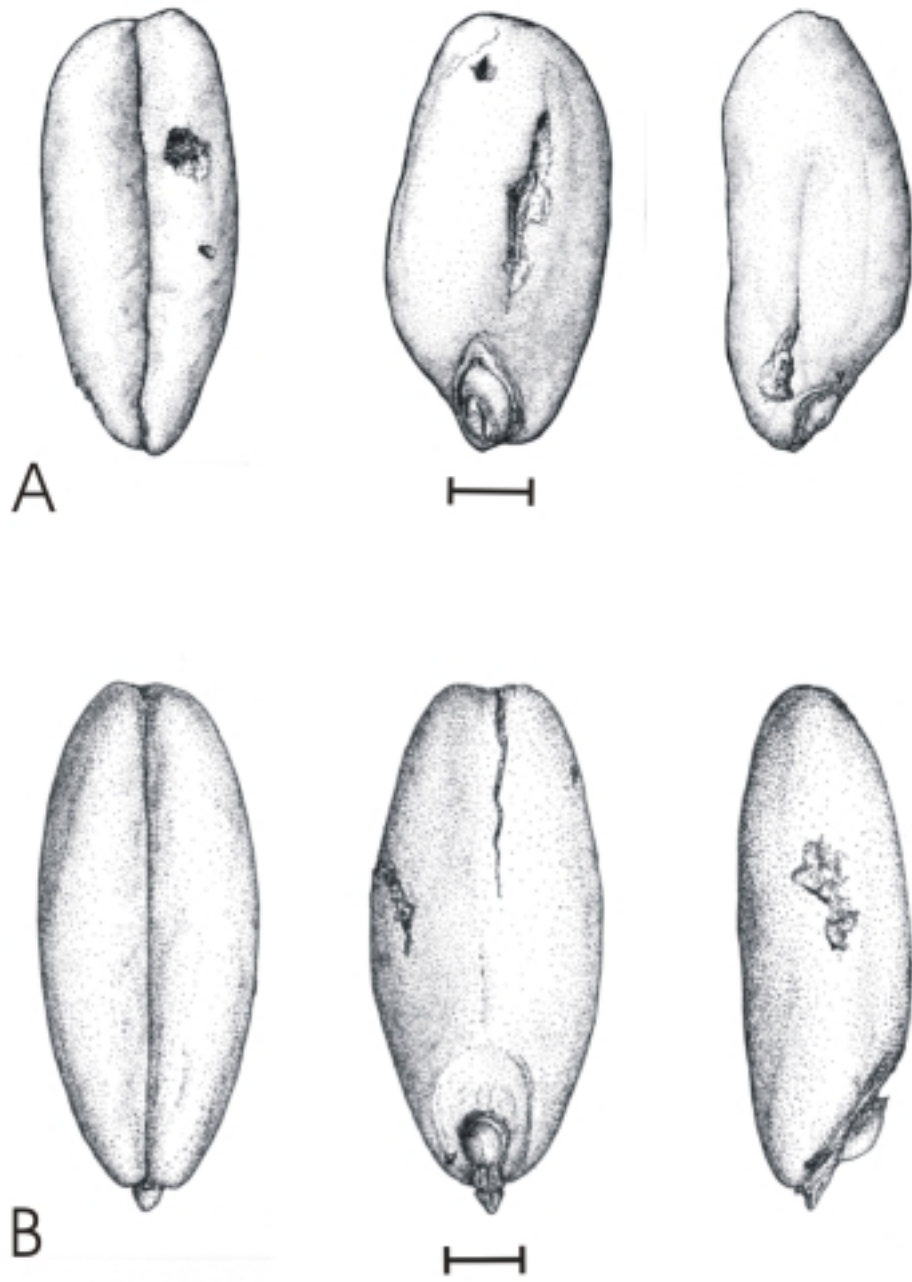


Fig.1. **A:** Emmer and **B:** spelt (grains)

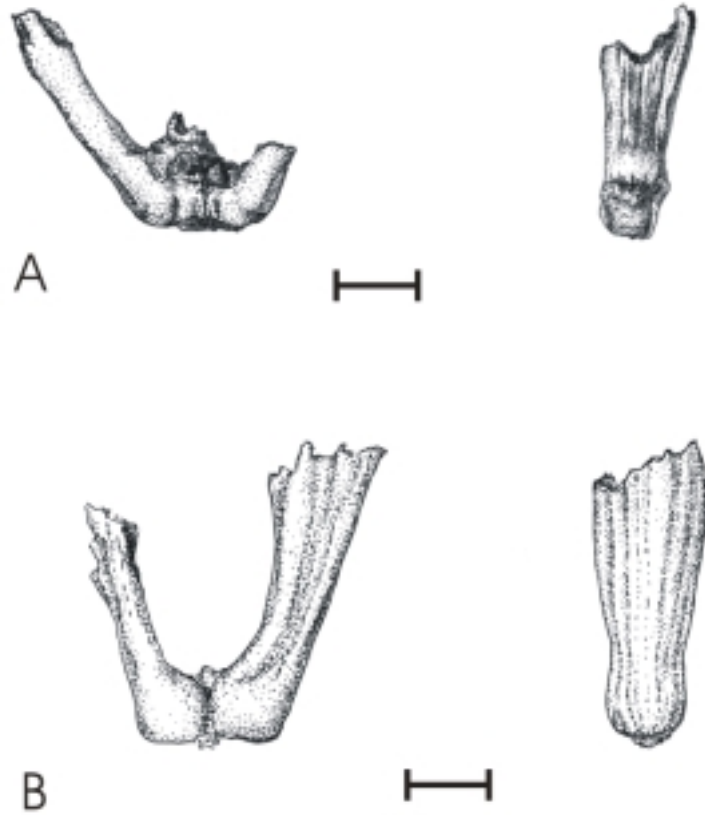


Fig. 2. **A:** Emmer and **B:** spelt (spikelet forks)

### Conclusions

The studied material gives a general frame of Early Bronze Age agriculture and vegetation use at Dabene-Sarovka, which shows the typical tendencies observed in Bulgaria and in the Balkans during that period. Accordingly, the archaeobotanical study of the site Dubene-Sarovka revealed a wide scale of used plants. The main crops were the hulled wheat, dominated by emmer. The hulled barley was in the second place after the wheat. The weeds found in the storage are typical for winter crops. Of the pulses the most important seems to be the lentil. The rear preserved in the sites with dry conditions oil/fiber crop – flax – was recorded in big quantities in a building from layer IIB. The most important for the period collected plant cornelian cherry is well presented in the site. The further investigation of the different levels would represent a diachronic view on the Late Copper and Early Bronze Age paleobotany in the region of the Upper Stryama valley.

		Sample Number											
		1	2	3	4	5	6	8	10	11	14	16	
<b>Cultivated plants</b>													
Einkorn	Triticum monococum	131	16	34	6	2	9	-	6	8	7	162	
Emmer	T. dicocum	1786	327	51	3	6	11	-	6	2	21	258	
Spelt	T. spelta	46	8	-	-	-	+	-	-	-	-	-	
Nacked wheat	T. cf. aestivum s. l.	3	-	-	-	1	-	-	-	-	-	-	
Barley	Hordeum vulgare	36	-	9	7	-	35	27	1	1	-	4	
Lentils	Lens culinaris	-	3	-	1	-	2	-	-	-	-	2	
Bitter wetch	Vicia ervilia	-	-	-	-	-	-	-	1	-	-	-	
Pea	Pisum sativum	-	-	-	-	-	-	-	-	-	-	-	
Cultivated flax	Linum usitatissimum	1	-	-	1	-	-	-	-	-	-	-	
Flax	Linum sp.	-	-	2	-	-	-	1	-	-	-	-	
<b>Collected plants</b>													
Cornelian cherry	Cornus mas	-	-	-	-	-	-	-	-	-	-	1	
Plums	Prunus sp.	-	2	-	-	-	-	-	1	-	-	-	
Oak	Quercus sp.	-	1	-	-	-	-	-	-	-	-	-	
Dwarf elder	Sambucus ebulus	-	-	-	-	-	-	-	4	-	-	-	
<b>Weeds and other wild plants</b>													
Brome grass	Bromus arvensis	17	-	-	-	-	1	-	-	-	-	-	
Drooping brome	Br. cf. tectorum	8	-	-	-	-	-	-	-	-	-	-	
Brome grass	Bromus sp.	44	4	-	-	-	7	-	-	-	2	-	
False cleavers	Galium cf. spurium	-	-	-	-	-	-	-	-	-	-	-	
Bedstraw	Galium sp.	-	-	-	-	-	-	-	-	-	-	-	
Nipplewort	Lapsana communis	-	-	-	-	-	-	-	-	-	-	-	
Field gromwll	Lithospermum arvense	-	1	-	-	-	-	-	-	-	1	-	
Meadow grass	Poa sp.	-	2	-	-	-	-	-	2	-	-	-	
Rough meadow grass	Poa pratensis/trivialis	4	-	-	-	-	-	-	-	-	-	-	
Knotgrass	Polygonum aviculare	1	-	-	-	-	-	-	-	-	-	-	
Black bindweed	P. convolvulus	7	4	-	-	-	-	-	-	-	-	6	
bindweed	Polygonum sp.	-	10	-	-	-	-	-	-	-	-	-	
Tormentil	Potentilla sp.	-	1	-	-	-	-	-	-	-	-	-	
Sorrel	Rumex sp.	1	-	-	-	-	-	-	-	-	-	-	
Bristle-grass	Setaria verticillata/viridis	4	-	-	2	-	-	-	-	-	-	1	
Dover	Trifolium sp.	-	2	-	-	-	-	-	-	-	-	-	
Smooth tare	Vicia cf. tetrasperma	-	-	-	1	-	1	-	-	-	-	-	
Daisy family	Asteraceae	-	-	-	-	-	-	-	-	-	-	-	

Tab. 2.a. The plant taxa identified in the Dubene-Sarovka IIB, Early Bronze Age II.

		Sample Number	18	21	22	23	26	27	28	29	30	31
<b>Cultivated plants</b>												
Einkorn	Triticum monococum	7	6	69	10	60	27	12	18	9	5	
Emmer	Tr. dicocum	4	4	21	4	21	56	16	5	7	9	
Spelt	Tr. spelta	-	-	-	-	-	+	-	-	+	-	
Nacked wheat	Tr. cf. aestivum s. l.	-	-	-	-	-	-	-	-	1	-	
Barley	Hordeum vulgare	-	-	18	-	-	1	2	6	2168	31	
Lentils	Lens culinaris	-	1	2	-	-	1	-	-	3	7	
Bitter wetch	Vicia ervilia	-	-	-	3	-	-	-	2	-	-	
Pea	Pisum sativum	-	-	1	-	-	-	-	1	-	-	
	Linum usitatissimum	-	-	-	-	-	-	-	-	-	-	+
	Linum usitatissimum	-	-	-	-	-	-	-	-	-	-	+
<b>Collected plants</b>												
Cornelian cherry	Cornus mas	3	-	1	1	-	1	-	-	-	-	
Plums	Prunus sp.	1	-	-	-	-	-	-	-	-	-	+
Oak	Quercus sp.	-	-	-	-	-	-	-	-	-	+	-
Dwarf elder	Sambucus ebulus	-	1	-	2	-	-	-	-	-	-	-
<b>Weeds and other wild plants</b>												
Brome grass	Bromus arvensis	-	-	-	3	-	-	-	-	-	39	-
Drooping brome	Br. cf. tectorum	-	-	-	-	-	-	-	-	-	-	-
Brome grass	Bromus sp.	-	-	12	-	-	18	-	-	-	171	-
False cleavers	Galium cf. spurium	-	-	-	-	-	-	-	-	-	-	-
Bedstraw	Galium sp.	1	-	-	-	-	1	-	-	-	-	-
Nipplewort	Lapsana communis	-	-	-	-	-	1	-	-	-	-	-
Field gromwll	Lithospermum arvense	-	-	-	-	-	-	-	-	-	-	-
Meadow grass	Poa sp.	-	-	-	-	-	-	-	-	-	-	-
Rough meadow grass	Poa pratensis/trivialis	-	-	-	-	-	6	-	-	-	9	-
Knotgrass	Polygonum aviculare	-	-	-	-	-	-	-	-	-	-	-
Black bindweed	P. convolvulus	1	-	-	-	-	-	-	-	-	-	-
bindweed	Polygonum sp.	-	-	-	-	-	-	-	-	-	-	-
Tormentil	Potentilla sp.	-	-	-	-	-	-	-	-	-	-	-
Sorrel	Rumex sp.	-	-	-	-	-	-	-	-	-	-	-
Bristle-grass	Setaria verticillata/viridis	-	-	3	-	1	-	-	-	-	-	-
Dover	Trifolium sp.	-	-	-	-	-	-	-	-	-	-	-
Smooth tare	Vicia cf. tetrasperma	-	-	-	-	-	-	-	-	-	-	-
Daisy family	Asteraceae	-	-	-	-	-	6	-	-	-	-	-

Tab. 2.b. The plant taxa identified in the Dubene-Sarovka IIB, Early Bronze Age II.

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