

Archaeobotany at Kaman-Kalehöyük 2006

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INTRODUCTION

Archaeobotanical field research continued at Kaman-Kalehöyük in 2006, with the presence of three archaeobotanists at the site in July and August. Archaeobotanical field research aimed to continue sample collection, processing and assessment, thus adding to the site's archaeobotany archive (see Nesbitt 1993; Kennedy 2000; Fairbairn 2002; 2003; 2004; 2005; in press). The archaeobotany project's overall aims are to further understand the economic and environmental relations of past societies as evidenced through plant remains, especially during major phases of cultural and political change in the 2nd and 1st Millennia BC. The main focus of research effort in 2006 was the collection and processing of flotation samples – that is bulk soil samples from hearths, pits and other features – providing a sample of the plant remains used and discarded at the site. 102 flotation samples were processed during the season with >50 more collected from Strata I, II, III and IV. In addition 35 phytolith samples were collected from pit linings and other deposits, thus providing a means of evaluating pit and feature function (see Fairbairn and Omura 2005). Samples of daub, mudbrick, charred structural timbers and seed concentrations were also added to the research archive.

Flotation samples were processed using the on-site flotation tank (Nesbitt 1995) and 23 were subject to a brief scan and assessment of sample composition (Table 1). Most of the assessed samples were from pits and hearths, contexts which usually contained high concentrations of charred plant remains, directly linked to specific episodes of burning in the case of hearth debris. The assessment procedure consisted of estimating the abundance of key sample components (Table 1, Section B) and key plant taxa in the seed assemblage (Table 1, Section C) using a relative abundance scale

(see legend in Table 1). While not constituting final data, the assessment procedure provides a useful basis for evaluating sample composition and identifying samples that are of value for future full archaeobotanical analysis. The assessments are also a reliable basis for preliminary investigations of the presence of crop taxa in the site (see Fairbairn in press, Figure 4). The current report was prepared before full phasing data were available for the samples, hence only a few can be attributed to specific occupation phases (Table 1, Section A).

In addition to the overall composition, preliminary identification of 9 wood charcoal samples was undertaken by Catherine Longford. The wood charcoal investigations were by no means comprehensive, but provided the first insights into the use of wood resources at the site and the presence of tree taxa in past local environments. Botanical forays in the local area (<3km from the site), confirmed that the natural tree cover has all but disappeared. Apart from planted poplars and orchard species, the only native species were a small number of low-growing hawthorn (*Crataegus* sp.) and blackthorn (*Rhamnus* sp.) specimens growing on the slopes of the mountain to the south of the site and a small group of stunted hackberry (*Celtis* sp.) trees crowning its top.

PLANT REMAINS

Sample data are shown in Table 1. Most samples contained a mixture of wood charcoals and a familiar range of crop and wild plant seeds. The most common crop types were cultivated barley (*Hordeum vulgare*) and free-threshing wheat, mainly hexaploid (*Triticum aestivum*) on the basis of the rachis internode segments. Hulled wheats, most commonly einkorn (*Triticum monococcum*), were also commonly present, with

rye (*Secale cereale*) in one of the Ottoman samples. Cultivated legumes were also present sparsely through the sample set, with bitter vetch (*Vicia ervilia*) most common. A few fruit seeds and stones were also present. The wild plant seeds consisted of dryland and wetland plant species from agricultural, ruderal and grassland settings. A new taxon identified at a tentative level in only 1 sample was wild einkorn (*Triticum cf. boeoticum*), a common crop weed today in the fields and verges of the Kalehöyük area. Seed abundance varied widely, with chaff elements less abundant and common than cereal grains. Some of the pit fills contained highly diverse seed assemblages, perhaps indicating that a wide range of activities contributed to the deposits accumulated there.

Brief wood charcoal analysis identified the presence in several samples of numerous fragments of oak (*Quercus* sp.) and willow/poplar (Salicaceae), as well as a conifer species (Gymnosperm), possibly pine, in several samples (Table 1 Section D). Oak and conifer wood was present in the Early/Late Bronze Age samples, with both taxa and the willow/poplar in the Iron Age and Ottoman period samples.

DISCUSSION AND CONCLUSION

In 2006 the Kalehöyük archaeobotany project provided a significant addition to the developing sample archive and sample assessment some new insights into plant use at the site. The seeds and fruits were of a familiar range, but the wild seed assemblages of such diversity to suggest that significant information about agricultural practices and land use may be available as a result of their analysis. The wood charcoal results, albeit provisional and by no means providing a comprehensive picture of wood collection and use, showed the use of species (oak and conifer) currently absent in the immediate vicinity of the site. Oak is part of the natural woodland of Central Turkey and has widely been reduced in abundance or totally lost as a result of over-harvesting, land clearance, agricultural and grazing pressures. Its presence in the past, along with conifer wood which is also absent from the local area today, suggests that either the environment was significantly different from that visible today, or that wood from those taxa were being

imported to the site from elsewhere. If the former is correct, the new data suggest a significant degradation in the local vegetation cover in the last 400 years. Further and fuller analysis will provide more data to investigate these possibilities and add to the limited wood charcoal record for Central Turkey in the last 4,000 years (e.g. Miller 1999).

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Table 1. Plant taxa recorded in samples from Kaman-Kalehöyük in 2006 using the following scale of abundance: * = rare; ** = occasional; *** = frequent; **** = abundant; ***** = very abundant

A. SAMPLE DETAILS		2006/012	2006/013	2006/046	2006/069	2006/010	2006/011	2006/014	2006/017	2006/056	2006/015	2005/016	2006/007
Sample	Area (e.g. Noth)	Noth	Noth	Noth	Noth	Noth	Noth	Noth	Noth	Noth	South	South	South
Sector		V	V	V	V	VIII	XXXII	XXXII	XXXII	XXXII	LVIII-LIX	LVIII-LIX	LV 49
Grid		XXXVII-54	XXXVIII-55	XXXVII-55	XXXVII-55	XLIII-50	XLIII-51	XLIII-51	XLIII-51	XLIII-50	Baulk	Baulk	92
Provisional layer		85	72	76	79	51	72	73	74	57	②	③	47
Feature		P281	P2935	P2951	P2962	P2934	P2934	R289	P2937	P2955	P637	P773	R152
Kaman Phase		IIIc/IV a	IIIc/IV a	IIIc/IV a	IIIc/IV a	II	II	II	II	II	I	I	-
Wood charcoal >4mm	*****	****	***	****	****	****	**	****	****	**	****	****	**
Wood charcoal >2mm	*****	***	*****	*****	*****	*****	****	*****	****	****	*****	*****	**
Cereal grain	*****	***	***	***	***	***	***	***	***	***	***	***	***
Cereal chaff	*****	***	**	**	**	**	**	**	**	*	**	**	*
Large-seeded legumes	***	**	**	**	**	**	**	**	**	*	**	**	*
Large fruits				*									
Nuts and nutshell								*	*			*	
Charred wild plant seeds	*****	***	**	***	***	***	**	***	***	***	***	*****	**
Siliceous seeds	**	*	**	**	**	***	***	**	***	**	**	*	**
Mineralised seeds	**	*	*	*	*	*	*	*	*	**	*	*	*
Dung	**	*	**	**	**	**	**	**	**	*	*	*	*
Straw etc	**	**	**	**	**	**	**	*	*	*	**	**	*
Siliceous awns	*****	**					*		****				
B. SAMPLE COMPOSITION													
C. ASSESSMENT													
Cereal taxa	Component												
<i>Hordeum vulgare</i>	Grain	***	**	*	**	****	**	**	**	**	**	****	*
<i>Hordeum vulgare/distichum</i>	Rachis internode							**	**			****	
<i>Triticum</i> free threshing	Grain	**	**	**	***	**	*	*	**	**	***	***	*
<i>Triticum</i> hexaploid type	Rachis internode	*	**	**	*	**	**	*	*	*	*	***	
<i>Triticum</i> sp. free-threshing type	Rachis internode	*	**	**	*	**	**	*	*	*	*	***	
<i>Triticum</i> sp.	Rachis internode	*	**	*	*	**	**	*	*	*	*	***	
<i>Triticum monococcum</i>	Grain	**	**	*	*	**	**	*	**	**	*	*	*
<i>Triticum monococcum/dicoccum</i>	Grain	**	**	*	**	**	**	*	**	**	*	*	*
<i>Triticum monococcum/dicoccum</i>	Glume base	*****	**	*	*	*	*	*	*	*	*	*	*
<i>Triticum</i> spp.	Grain						**	**					
<i>Secale cereals</i>	Grain											**	**
Cerealia	Grain	*****	**						**			***	**
Cerealia	awn fragments		**										*
Cerealia	Rachis internode	*	**	*	**	*	*	*	*	*	*	***	*
Cerealia	Culm nodes											***	
Cultivated legume taxa													
<i>Cicer arietinum</i>	Seed		*	*	*	*	*	*	*	*	*	*	*
<i>Lens</i> sp.	Seed		*	*	*	*	*	*	*	*	*	*	*
<i>Pisum</i> sp.	Seed		*	*	*	*	*	*	*	*	*	*	*
<i>Vicia ervilia</i>	Seed	***	*	*	*	*	*	*	**	*	*	*	*
Fruits													
<i>Vitis</i> sp.	Seed	*	*	*	*	*	*	*	*	*	*	*	*
<i>Prunus</i> sp.	Seed							*	*	*	*	*	*

Table 1 (continued)

	Sample	2006/012	2006/013	2006/046	2006/069	2006/010	2006/011	2006/014	2006/017	2006/056	2006/015	2005/016	2006/007
	Kaman Phase	IIIc/IV a	IIIc/IV a	IIIc/IV a	IIIc/IV a	II	II	II	II	II	I	I	-
Wild plant taxa													
<i>Arnebia/Lithospermum</i>	Seed	***	*	**	**	**	***	**	**	**	*		**
<i>Bolboschoenus maritimus</i>	Seed				**	*	*						
<i>Bromus</i> sp.	Mineralised Seed						*				**		
<i>Caryophyllaceae</i>	Seed					*		**		*			
<i>Chenopodium/Atriplex</i> sp.	Seed		*			*				*	***		
Cruciferae	Seed					*				*	****		
Cyperaceae	Seed	*											
<i>Eleocharis</i> sp.	Mineralised Seed	*				*							
<i>Gallium</i> type	Seed	*	*	*	**	*					***		*
Gramineae (small types)	Seed	****	**	**		**		**	**	**	****		*
Gramineae (large types)	Seed	***	**			**				**	**		*
<i>Helictropium</i> sp.	Seed												*
<i>Hordeum</i> wild types	Seed					*							
Lamiaceae	Seed	***	**			*					**		**
Leguminosae (small)	Seed	*				*	**	***		**	*		*
Leguminosae (large)	Seed			*	**	*				**	**		
<i>Lolium</i> sp.	Seed	*	*			*							
<i>Papaver</i> sp.	Seed												*
<i>Plantagosp.</i>	Seed												*
<i>Polygonum</i> sp.	Seed	**				*		**	*				
<i>Rumex</i> sp.	Seed										*		
<i>Stipa</i> sp.	Seed					**							
<i>Taeniatherum caput medusae</i>	Seed	**	*			*							
<i>Tenacium</i> sp.	Seed					*							
<i>Ziziphora</i> sp.	Seed	**	*			*					**		**
Indeterminate	Seed	****	**	**	***	***	**		**	***	****		***
Indeterminate	Mineralised Seed					****							
D, WOOD CHARCOAL													
Gymnosperm					P					P			
<i>Quercus</i>				P	P		P			P			
Salicaceae							P						

Table 2 (continued)

Wild plant taxa	Kaman Phase										
	2006/003	2006/008	2006/005	2006/001	2006/006	2006/004	2006/009	2006/023	2006/031	2006/035	2006/037
Seed			*								
<i>Adonis</i> sp.									*		
Asteraceae		***							**	*	***
<i>Arnebia/Lithospermum</i>		*				*	***		**	*	***
<i>Bolboschoenus maritimus</i>		*				**	*			*	
<i>Caryophyllaceae</i>						**	**				
<i>Chenopodium/Atriplex</i> sp.							**				
Cruciferae		*		*			**				
Cyperaceae		**		*			*				
<i>Galium</i> type		**	*	*		*	*		*		
Gramineae (small types)		**	*	*		**	***		**	**	
Gramineae (large types)		**	**	*		**	*		**	**	
<i>Hordeum</i> wild types		*					*				
<i>Juncus</i> sp.				**			*				
Lamiaceae				**		*	*				
Leguminosae (small)		**		**		**	*		**		
Leguminosae (large)		*	*	*		**	*		**	**	
<i>Lemna</i> sp.							*				
Mineralised Seed							*				
<i>Lolium</i> sp.		*					*				
<i>Papaver</i> sp.		**					*				
<i>Polygonum</i> sp.				*			*				
Primulaceae			*				*				
<i>Rumex</i> sp.							*				
<i>Setaria</i> sp.				*			*				
<i>Salsola</i> type				*		*	*				
Umbelliferae				*		***	*				
<i>Ziziphora</i> sp.		**		*		**	*		**	**	***
Indeterminate		***		**		**	*		**	**	***
Indeterminate		*					*				
Mineralised Seed							*				
D. WOOD CHARCOAL											
Gymnosperm									P	P	P
<i>Quercus</i>									P	P	P
Salicaceae									P	P	P

