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O sítio arqueológico da Gaspeia

e a neolitização do território de Alvalade - Sado



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Museu de Arqueologia e Etnografia do Distrito de Setúbal /
/Associação de Municípios da Região de Setúbal



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Plant imprints in daub fragments from the early Neolithic site of Gaspeia (Alvalade, Portugal)

Hans-Peter Stika

Emergency archaeological excavations were undertaken in several fieldworks campaigns due to works on the train track of the high Sado basin, Alentejo Litoral region, Southwestern Portugal.

The early Neolithic site of Gaspeia was one of the archaeological sites which was affected. From Gaspeia (Alvalade, Portugal), daub fragments from 75 different contexts were analyzed for plant imprints. Therefore several hundred samples containing daub fragments were visually inspected with the naked eye and with the help of a binocular loupe. Number and quality of visible imprints on the surface of the daub were low. All the analyzed daub was tempered minerally but not intentionally with plant material. For better visibility, the imprints which are negative hollows in the clay matrix were transformed to silicon casts which are then positive molds of the former plant material which had decayed. For the casts, the dental silicon Xantopren L blue and the activator Universal Plus were used. Of all hollows on the surface of the daub in the size of cereal grains or seeds of pulses, silicon casts were taken as well as from structures that were suspected of being caused by vegetable remains like seed, fruit, florescence, calyx, leaf, culm, spikelet, rachis, rhizome, etc. Our attention was focused on imprints of cereal grain and chaff as well as seeds of pulses to reconstruct the crop cultivation at the early Neolithic site. The plant imprints most probably were caused by chance and not because of intentional use of chaff for tempering the clay and preventing desiccation cracks. Most of the analyzed cavities turned out to be caused by pebbles as suggested by the irregular and dull surface of the silicon casts.

In the daub fragments of the 75 samples of which silicon casts were taken, a total of 219 imprints were analyzed (s. Tab. 1). Only a small portion of these imprints were caused by plant material. In 32 samples a total of 89 plant imprints were found. Crops are represented by only 9 cereal imprints (s. Tab. 2) in 7 pieces of



Fig. 1 - Location in the Iberian Peninsula of Gaspeia and Casas Novas, sites compared in this paper.

daub from 7 different samples. Two grains were found, one grain identified as barley (*Hordeum vulgare*) another grain could not be determined further then indeterminate cereal (*Cerealia Indeterminata*). The silicon casts of other imprints showed parts of the spikelet most probably from einkorn (*Triticum cf. monococcum*) because of a narrow angle and another one possibly from emmer (*T. cf. dicoccum*) with a wide angle of the basal glumes (for details of determination see Jacomet *et al.* 2006). Only one silicon cast of a spikelet imprint is well enough preserved to be absolutely certain with the identification as emmer wheat (*Triticum dicoccum*). Some chaff imprints of culms and a rachis segment are less diagnostic and cannot be determined to species level. Those casts are listed in Tab. 1 as (*Cerealia Indeterminata*). The separation of cereal culms and wild grass culms is made by size. Culm fragments are rounded tubes with culm nodes, sometimes with a fine cellular structure in longitudinal direction visible under magnification on the outside. Other identification of plants as florescence/

(continuation) Table 1 - Sample of daub fragments analysed and some pottery sherds (brown).

Sond.	Sector	Square	Layer	Number	Grain	Spikelet	Cer culm	Cer rachis	Poac culm	Plant Indet	Plant Rhizom	Calyx/ fruit	Plant twig	Leaf frag.	Pebble	Indet.	
XIX	26	Struct.26.D6	2C	GASP.05.2971													
XIX	16	Struct.16.F19	2C	GASP.05.2972	Poaceae culm frag. 2, Plant Indet. Frag. 2		1		2	2							
XIX	16	D1	2C base	GASP.05.2973	Poaceae culm frag. 4				4								
XIX	16	E16 - Struct.16.E16	2C	GASP.05.2974	Poaceae culm frag. 4				4								
XIX	26	E4	2C base	GASP.05.2975	Poaceae culm frag. 2				2								
XIX	16	Estr. 16.F20	2C	GASP.05.2976	Poaceae culm frag. 3				3								
XIX	16	E20	2C base2	GASP.05.2977	Plant Indet frag. 3, pebble 2				3						2		
XIX	16	E8	2C base2	GASP.05.2980	pebble 1										1		
XIX	16	E8	2C base2	GASP.05.2981	pebble 1										1		
XIX	16	E16 (1/2 S)	2C		pebble 4										4		
XIX	16	F17 (1/2 S)	2C		pebble 2										2		
XIX	16	F19 (1/2 E)	2C		Plant Indet. 3, pebble 1					3					1		
XIX	16	F20	2C		pebble 2										2		
XIX	16	E16	2C		Plant Indet. 1, pebble 2					1					2		
XIX	16	D18	2C base2		pebble 2										2		
XIX	16	E17	2C base2		pebble 2										2		
XIX	16	F20	2C base	GASP.05.3074	Cerealia culm frag. 1, plant Indet. frag. 1, pebble 2		1			1					2		
XIX	16	E20	2C base2		twig frag. 1								1				
XIX	16	E16 (1/2 N)	2C		Plant Indet. calyx/fruit frag. 1							1			3		
XIX	16	E19 (1/2 N)	2C		pebble 3												
XIX	26	F1 (1/2 E)	2C base		Indet. 1											1	
XIX	NW	E9	2C base2		pebble 3										3		
XIX	26	F12	2A		pebble 2										2		
XIX	26	E8	2A base		pebble 2										2		
XIX	26	D2	2D		pebble 7										7		
XIX	26	D14	2C base		evergreen broad-leaved frag. 2 with spines									2			
XIX	26	F10 - Struct.26F10 (1/2 O)	2C	GASP.05.3075	Triticum dicoccum spikelet 1							1					
XIX	26	F9	2C base2		pebble 4										4		
XIX	26	F9	2C base2		Plant Indet. frag. 1, pebble 3					1					3		
XIX	26	F10 (1/2 O)	2C		Plant Indet. frag. 4, cf. florescence/calyx 1					4		1					
XIX	26	F1	2C base /2D		pebble 4										4		
XIX	26	F10 (1/2 E)	2C		pebble 1										1		
I		K10	2C	GASP.81.3119 Pottery sherd	Indet. 1											1	
III		C13	2C	GASP.81.3120 Pottery sherd	pebble 6										6		
III		C16	2C	Pottery sherd	pebble 3										3		
I		C9	2C	Pottery sherd	pebble 3										3		
					2	3	3	1	54	20	1	2	1	2	124	6	
					in 32 daub pieces												219 total
					in 7 daub pieces												89 plant
																	9 cereal

Table 2 - Cereal imprints in daub from the early Neolithic sites of Gaspeia and Casas Novas.

Cereal imprints in daub		Gaspeia	Casas Novas	
	rest type	Sum	Sum	
daub from x samples		75	26	
Cerealia				Cereals
<i>Hordeum vulgare</i>	grain	1	1	barley
<i>Triticum cf. monococcum</i>	spikelet frag.	1	1	cf. einkorn
<i>Trit. monococcum/dicoccum</i>	spikelet frag.		6	einkorn/emmer
<i>Triticum dicoccum</i>	spikelet frag.	1		emmer
<i>Triticum cf. dicoccum</i>	spikelet frag.	1		cf. emmer
<i>Triticum cf. dicoccum</i>	grain		1	cf. emmer
Cerealia Indet.	grain	1		cereal grain
Cerealia Indet.	chaff frag.	4	7	cereal chaff
		9	16	Total

calyx, rhizome, twig, and broad-leafed evergreen cannot be specified further. Evergreen broad-leafed plants are typical for the local vegetation with evergreen oak species as an example.

For the early Neolithic site of Gaspeia only very few imprints were found and identified. The short plant list indicates a developed agriculture with at least barley, einkorn and emmer. The comparison of the daub analyses of Gaspeia and Casas Novas (Stika, 2018) display similar results (s. Tab. 2). Early Neolithic sites of Portugal where carbonized plant remains were analyzed e.g. São Pedro de Canaferrim yielded in addition to the hulled wheat species of einkorn and emmer free-threshing wheat (*Triticum "nudum"*) and there, barley could be specified: free-threshing (*Hordeum vulgare* var. *nudum*) and hulled barley (*Hordeum vulgare* var. *vulgare*) (López-Dóriga, 2015). The new data from Gaspeia enrich the knowledge for early Neolithic cereal cultivation of the Iberian Peninsula but do not change its pattern (see Zapata Peña *et al.* 2004a and b). The spatial density analysis map for the Neolithic transition of the Iberian Peninsula (García Puchol *et al.* 2018) should be updated with new archaeobotanical data to fully understand the neolithization process.

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