

# Appendix 3: Assessment of the archaeobotanical remains (Mai Walker)

## INTRODUCTION

This report presents an assessment of the environmental remains recovered during archaeological excavations at Yeoman Park Academy, Mansfield.

## AIMS AND OBJECTIVES

The aims and objectives of the environmental sampling programme and resulting assessment reflected those of the project. The project aims and objectives are focused on providing a detailed record of the archaeological remains prior to their loss through the proposed development, and the recovery and assessment of associated environmental evidence to determine the potential of the material to address specific research themes.

## METHODOLOGY

During excavations, eight 10 litre bulk paleoenvironmental samples were recovered and submitted for assessment of its environmental potential, which included processing to recover charcoal, small bones, cereal grains and macro-environmental material. Sediment from the samples was described as a light to mid-brown, firm, silty clay, with some charcoal flecks.

Samples were processed using standard 'Siraf'-style flotation tanks (Williams 1973) at Ecus facilities in Barnard Castle. The processing of environmental samples was undertaken in accordance with Historic England guidelines (Dobney 1992; Campbell *et al.* 2011). Light fractions (flots) were collected using a 500 µm (micron) mesh, and sieved to 1 mm. Sample fractions were dried, and light fractions were sieved using 2 mm and 1 mm Endecott sieves and sorted under a low-powered Microtec stereo zoom microscope. Dry heavy fractions were sieved at 4 mm and 2 mm, with the >4 mm fraction sorted and the <4 mm scanned for any artefacts or ecofacts. Each heavy fraction was scanned with a magnet to retrieve magnetic material/hammerscale.

Plant macrofossils were identified to the lowest taxon, where possible, using a reference collection of modern specimens and published identification guides (Ellis 2005; Cappers *et al.* 2006; Jacomet 2006; Hather 2016). During the assessment selected grains were identified to genus or species to provide a broad understanding of the plant remains from the site and assess the potential for further work on the assemblage. A taphonomic assessment of each fragment was undertaken, recording evidence of charring, surface deposits and surface condition. Any other surface modifications of note were also recorded. Fragments of grains that could be identified as cultivated were grouped as far as possible using size and class or order categories. Fragments representing >50 % of a complete grain were counted as one, while those smaller were counted as a grain fragment. All material has been counted and assigned an abundance score, listed as; a (1-10), b (11-50), c (51 – 100), d (101-200), e (201-500), f (501 – 1000), g (>1000). Results were recorded in an electronic proforma in Microsoft Excel.

## **OUTLINE OF THE ASSEMBLAGE**

A total of 1.89 grams of fragmentary charcoal was extracted from eight bulk soil samples, approximately 58 fragments of charcoal measured >2 mm in size and over 262 fragments measured <2 mm in size (Table 3.1). It was noted that moderate sediment concretion was present throughout charcoal fragments.

A single possible Barley cereal grain (cf. *Hordeum vulgare*) was present in context 1015. The cereal grain had notable high distortion and very poor preservation.

One wild charred Sun spurge seed (*Euphorbia Helioscopia*) was recorded within context 1015, and an indeterminate charred wild grass seed was recorded from context 8008.

A low abundance of uncharred modern plant remains were recorded within contexts 8006 and 8008. Low abundances of modern plant remains included Goosefoot (*Chenopodium a.*) (abundance a) and Elder (*Sambucus nigra*) (abundance a - b).

A low frequency of modern roots, Fungal Sclerotia and worm eggs were recorded in the samples, which may suggest evidence of some bioturbation within the deposits. Indeterminate insect Pupae fragments were found within context 9006. Contexts 1015 and 8008 contained low abundances of coal, and a fragment of industrial material was present in context 9006. A single fragment of possible bone was also identified from context 9006.

## **STATEMENT OF POTENTIAL**

The archaeobotanical material recovered from bulk samples at Yeoman Park Academy, Mansfield is too small an assemblage to allow for deeper interpretations or to determine archaeological importance; however, a very poorly preserved charred Barley cereal grain was present within fill 1015 of ditch 1014. A single fragment of industrial material and a low abundance of coal were also identified within fill 1015 of ditch 1014, and contexts 8008 and 9006.

The assessment recorded low frequencies of charcoal, with occasional fragments recorded as being vitrified. However, the assemblage is small and does not allow conclusions to be drawn on how fuel was used on the site. The moderate distortion to some of the charred remains may indicate that the cereals may have been exposed to moderate to high temperatures or reoccurring fires (see Charles *et al.* 2015).

A low frequency of modern roots, Fungal Sclerotia and worm eggs were recorded within context 9006, which may suggest evidence of some bioturbation within the sample. The remains of an indeterminate insect Pupae were fragmented and unfortunately did not allow for further identification.

## **CONCLUSIONS AND RECOMMENDATIONS**

Components of the assemblage may have the potential to provide sufficient material for radiocarbon dating should this be desirable, such as the cereal grain within ditch fill 1014. The charcoal assemblage would require species identification and sample selection in advance of submission for C14 dating. The charred plant remains should be retained for the duration of the project and may be discarded at project archiving.

## REFERENCES

- Campbell, G., Moffett, L. and Straker, V. (2011) *Environmental Archaeology. A Guide to the Theory and Practice of Methods from Sampling and Recovery to Post-excavation*.
- Cappers, R., Bekker, R. M., and Jans, J. E. A. (2006) *Digitale Zadenatlas van Nederland* (Digital Seed Atlas of the Netherlands). Groningen: Barkhuis Publishing & Groningen University Library.
- Charles, M., Forster, E., Wallace, M. & Jones, G. (2015) "Nor ever lightning char thy grain": establishing archaeologically relevant charring conditions and their effect on glume wheat grain morphology, *STAR: Science & Technology of Archaeological Research*, 1:1, 1-6.
- Dobney, K., Hall, A. R., Kenward, H. K. and Milles, A. (1992) A working classification of sample types for environmental archaeology. *Circaea, the Journal of the Association for Environmental Archaeology* 9 (for 1991), 24-6.
- Delorit, R.J. (1970) *Illustrated Taxonomy Manual of Weed Seeds*. Wisconsin, Agronomy Publications.
- Ecus Ltd (2023) Yeoman Park Academy – Archaeological Evaluation Report.
- Ellis, R.H. (2005) *Seed identification handbook: agriculture, horticulture and weeds*. 2nd ed., Steve Jones, Jane Taylor and Felicity Ash (eds), NIAB, Cambridge, UK, 2004, 94.
- Jacomet, S. (2006) *Identification of Cereal Remains from Archaeological Sites* (2nd edition, trans. by James Greig), Basel, Archaeobotany Laboratory, IPAS, Basel University.
- Williams, D. (1973) Flotation at Siraf. *Antiquity* 47 (Issue 188), 288-92.

**Table 3.2: Data table**

<b>Context</b>		<b>1017</b>	<b>1015</b>	<b>1021</b>	<b>1031</b>	<b>1007</b>	<b>9006</b>	<b>8008</b>	<b>8006</b>
<b>Sample</b>		<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>1</b>	<b>2</b>	<b>3</b>
Flot Vol (ml)		1.6	3.2	0.9	1	2.5	-	-	-
Sufficient for AMS?		Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
Further analysis?		No	No	No	No	No	No	No	No
Sediment concretion		Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate	Moderate
Unidentified mineralised nodules		No	No	No	No	No	No	No	No
Preservation / Distortion of CPR		-	Very poor / Very distorted	-	-	-	-	Very poor / Very distorted	-
<b>Cereal</b>									
cf. Hordeum vulgare	Hulled Barley	-	1	-	-	-	-	-	-
<b>Charred seeds</b>									
"Euphorbia									
helioscopia (1-2mm)"	Sun spurge	-	a	-	-	-	-	-	-
Indet wild	Indet	-	-	-	-	-	-	a	-
<b>Uncharred plant remains</b>									
Chenopodium a.	Goosefoot	a	a	-	a	-	-	a	a
Sambucus nigra	Elder	-	-	b	b	-	-	a	a
<b>Charcoal</b>									
Weight (g) RT	-	0.1	0.58	0.05	0.1	0.3	0.1	0.34	0.32
Charcoal >2mm	Qty	4	13		3	2	4	14	18
Charcoal <2mm (approx.)	Qty	30	70	12	15	45	20	25	45
Roundwood	-	-	-	-	-	-	-	-	-
Notes	-	-	-	-	Some vitrification	-	-	-	-
Coal	Qty	-	10	-	-	-	-	13	-
<b>Finds</b>									
Bone	Qty						1		
Industrial waste / Fuel	Qty	-	1	-	-	-			
<b>Other Modern</b>									
Modern roots	-	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Insects	-		Yes	Yes	No	No	No	No	No
Worm eggs	-	Yes	No	No	Yes	No	Yes	No	No