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**Assessment of insect and parasite egg remains from two sites
on the M57 Merseyside Link Road - Brook House Farm (BHF34)
and Ochre Brook (OB35)**

by

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Summary

Twenty-three samples of sediment from two sites associated with the M57 Merseyside Link Road, Brook House Farm (BHF34) and Ochre Brook (OB35), have been assessed for their content of macro-invertebrate remains, and a small selection examined for eggs of parasitic nematodes.

No parasite eggs were found.

Only four samples, all from ditch fills, gave useful assemblages of insects; these are considered likely to provide a substantial amount of information concerning conditions within the infilling ditches and in their surroundings. There was no clear evidence of human activity or occupation from the insects, although this should be investigated further.

An intensive study of the insects (and some other invertebrates) from these four samples is recommended.

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Assessment of insect and parasite egg remains from two sites on the M57 Merseyside Link Road - Brook House Farm (BHF34) and Ochre Brook (OB35)

Introduction

Selected samples of sediment ('GBAs' *sensu* Dobney *et al.* 1992) from two sites on the M57 Merseyside Link Road - Brook House Farm (BHF34) and Ochre Brook (OB35) - were supplied by Liverpool Museum for assessment of their content of arthropod (especially insect) and parasite egg remains. Twenty samples from Brook House farm and five samples from Ochre Brook were submitted. Following an initial examination of the samples submitted (at which time a sediment description was made), all twenty of the samples from Brook House Farm and three of the five from Ochre Brook were processed for arthropod remains. Only three of the samples, all from Brook House Farm, were considered to be deserving of analysis for eggs of parasitic nematodes.

Methods

Eggs of parasitic nematodes

Analysis for eggs of parasitic nematodes as carried out using the 'squash' method of Dainton (1992). Other microfossils (e.g. phytoliths, diatoms, pollen and fungal spores) were also noted if present.

Insects and other arthropods

Test subsamples of 1 kg were employed in each case, following methods of Kenward *et al.* (1980) as modified by Kenward *et al.* (1986).

The flots or washovers were quickly examined for their content of arthropod remains, especially insects, a note being made of the principal species or communities present and of their preservational condition ('assessment recording' *sensu* Kenward 1992). An estimate of the time required for full

recording was made, and the assemblage prioritised for further work.

Results

Results from the parasite squashes are summarised in Table 1, and those from assessment of insects and other arthropods in Table 2.

Discussion and statement of Potential

The samples examined for parasite eggs contained none. This is not surprising in view of the nature of the insect assemblages from them; the deposits appear to be primarily naturally formed. Most of the samples from Brook House Farm contained either no macro-invertebrate remains or very few which were of no interpretative value. Some of them gave strongly yellowed or reddened remains which appeared to be the product of differential decay through the activity of micro-organisms under oxidising conditions; the beetles which had survived (mostly weevils) were typical of the last remnants in oxidised deposits.

The samples from four ditch fill contexts contained sufficient remains to deserve priority P1: Sample 3 from context 57; 46 from 185; 42 from 186; and 44 from 215 (Sample 3 would not be P1 if the other leaf-litter samples, with their much greater content of fossils, providing a baseline for comparison, were not present). This group should give a substantial amount of information about conditions in the ditches, and in their surroundings, as deposition took place. The impression obtained during assessment was of natural or semi-natural vegetation with no more than hints of human presence, although there may have been short vegetation such as grazing; this clearly requires careful elucidation.

Table 1. Records from assessment of parasite eggs and other microfossils from 'squashes' of samples from Brook House Farm and Ochre Brook. Recording times include taking measurements where appropriate, but do **not** include data entry and processing or writing. (F) following sample number = sample marked for flotation by excavator. (PS) following sample number = sample marked as priority sample by excavator.

Site/area/ context	Sample	Nature of Context	Notes	Priority for parasite eggs	Time to record (minutes)
Brook House Farm (BHF34)					
Samples taken from the internal enclosure ditch					
Section One - the shallow southern section					
53	2 (PS)	FILL of internal enclosure ditch (37)	Some organic debris. No microfossils seen.	P0	0
57	3 (PS)	ditto	Very slightly sandy (quartz), moderate humic content (mostly in lumps), a few plant hairs and some ?modern pollen (several types).	P0	0
Section Two - the deeper northern section					
215	44 (F, PS)	FILL of internal enclosure ditch (381)	Large amount of humic matter, often in discrete lumps. Abundant plant fragments (including leaf epidermis and hairs), pollen (several types) and a <i>Lycopodium</i> ? <i>annotinum</i> spore).	P0	0

Table 2. Assessment of subsamples for insect and other invertebrate macrofossil remains from Brook House Farm and Ochre Brook. Priority: P1 - should be studied further; P2 - study if time; P3 - little or no archaeological value, although records may be of use at a more general level; P0 - barren or effectively so. Time to record: estimated time for a scan record (sensu Kenward 1992) of the insects; this does **not** include time for data entry, processing, analysis and writing. (F) following sample number = sample marked for flotation by excavator. (PS) = sample marked as priority sample by excavator. In notes: E - measure of chemical erosion and F - measure of fragmentation (in each case 1 indicates fossils resembling modern material, 3 is about average in fossiliferous archaeological deposits, and 5 indicates extreme erosion and fragmentation). E0 or F0 indicated insufficient material to estimate. Assigned priorities assume fairly close dating.

Site/area/ context	Sample	Nature of Context	Notes	Priority	Time to record
Brook House Farm (BHF34)					
Samples taken from the internal enclosure ditch					
Section One - the shallow southern section					
53	2 (PS)	FILL of internal enclosure ditch (37)	Moderate numbers of fossils but all oxidised; range of remains suggests there has been differential preservation. Conceivably recent.	P3	30 minutes
57	3 (PS)	ditto	Very large flot (only part examined) containing modest numbers of insects and huge numbers of <i>Daphnia</i> ephippia.	P1	Sort: 16 hours Record: 2 hours
Section Two - the deeper northern section					
185	46 (F)	FILL of internal enclosure ditch (381)	Immense numbers of <i>Daphnia</i> ephippia and many beetles and bugs: aquatic and terrestrial forms, the latter able to give useful clues as to surrounding vegetation. Hints of human influence. Desirable to process more. (E2 F3)	P1	Process more: 4 hours Sort two sub-samples: 8 hours Record both: 10 hours

186	42 (F, PS)	ditto	Huge flot. Only part examined. Many <i>Daphnia</i> ephippia. Substantial insect assemblage, ecologically rich and varied. Will give useful information concerning conditions at point of deposition and in surroundings. Good preservation (E2 F2)	P1 ⁺	Sort: 16 hours Record: 8 hours
215	44 (F, PS)	ditto	Huge flot. Part examined. Many <i>Daphnia</i> ephippia. Modest group of terrestrial and aquatic beetles and other insects; probably will be useful in ecological reconstruction. (E3 F4)	P1	Sort: 16 hours Record: 4 hours
217	45 (F)	ditto	Only a trace of insect cuticle.	P0	0
Samples taken from the East-west ditch					
112	12 (PS)	FILL of East-West ditch (89)	Poorly preserved remains of three species of weevil, and a trace of cuticle of other forms. Certainly the product of differential decay and strong oxidation. (E4 F0)	P3	0 (existing record adequate)
114	13 (PS)	ditto	Small numbers of well-rotted fragments; only worth recording as an example of a group showing differential decay. (E4 F4)	P3	15
Samples taken from the external enclosure ditch					
47	20	FILL of outer ditch (37=52)	Traces of beetles only. (E4 F0)	P3	0 (existing record adequate)
49	21	ditto	Pale, very eroded scraps of cuticle only, although some could be identified; clearly strongly oxidised. (E4 F0)	P3	1 hour
Samples taken of a series of possible floor layers in the area of a group of stone packed post holes					
229	36 (PS)	LAYER (floor)/plough soil?	Only traces of insect remains, some at least possibly modern. (E4 F0)	P3	0 (existing record adequate)
343[=278]	52 (F, PS)	floor LAYER/trampled area	Only traces of insect remains, all possibly modern. (E4 F0)	P0	0

Samples taken from a four posted structure - consisting of a series of interconnecting linear features and post-holes/pits.					
101	5	FILL of rectilinear structure? (123). (Post-medieval pot)	Only traces of arthropod cuticle. (E4 F0)	P3	0 (existing record adequate)
124	6	ditto	Only traces of arthropod cuticle. (E0 F0)	P0	0 (existing record adequate)
163	33 (PS)	FILL of post hole (177)	A single fly puparium; no other invertebrates seen. (E0 F0)	P3	0 (existing record adequate)
174	28	FILL of post hole (175)	Only a few ?earthworm egg capsule fragments. (E0 F0)	P0	0
194	34 (PS)	FILL of post hole (177)	Several <i>Daphnia</i> ephippia and a ?fly puparium only. (E0 F0)	P0	0 (existing record adequate)
Other samples					
91	53 (F, PS)	FILL of linear feature (272). (Pre-historic pot/daub)	A single cladoceran ephippium only. (E0 F0)	P0	0 (existing record adequate)
105	11 (PS)	FILL of linear feature (126). (Pre-historic pot/daub)	No invertebrate remains seen.	P0	0
285	54 (F)	FILL of gully? (284). (Pot/ceramic)	Effectively barren. (E0 F0)	P0	0
Ochre Brook (OB35)					
Sample taken from a rubbish pit; one of a series found in the area of structure 1					
246	14	No further details supplied.	Effectively barren. (E0 F0)	P0	0
Sample taken from an internal boundary ditch; phase 8.2					
344	68	No further details supplied.	A single beetle only. (E4 F0)	P3	0 (existing record adequate)
Samples taken from the ditches in which the large quantities of Roman roof tile (including the two consular stamped tiles) were recovered					
338	69	No further details supplied.	NFA		

374	80	ditto	A single <i>Daphnia</i> ephippium; no other invertebrates seen. (E0 F0)	P0	0
403	115	ditto	NFA		

Recommendations and resources required

It is recommended that insect and other arthropod remains from the four P1 samples should be studied fully, an attempt being made to identify as many of the remains as possible in order to achieve a detailed picture of the surroundings.

It has been suggested for the sample from context 185 that further material should be processed in view of the rather thinly distributed fossils. It would also be useful to process further subsamples of the remaining three P1 samples; the diversity of the assemblages seen indicates that many additional taxa should be recovered, and these would probably give useful information. A second reason for processing more material is to determine whether species indicative of human occupation or other activity are present. Such a course of action would, however, be rather time-consuming.

Two programmes of further work may be considered:

1. The minimum programme of work (as stated in Table 2) would require, for basic practical work and recording (with the addition of an allowance of time for associated peripheral tasks), the following:

<i>Further processing</i>	<i>5 hours tech</i>
<i>Sorting</i>	<i>60 hours tech</i>
<i>Recording</i>	<i>25 hours RF</i>
	<i>8 hours RA</i>

To this should be added:

<i>Data entry and processing</i>	<i>6 hours RF</i>
<i>Writing technical report</i>	<i>30 hours RF</i>
	<i>8 hours RA</i>
<i>Contingency</i>	<i>4 hours tech</i>
	<i>4 hours RF</i>

<i>Total for minimum programme</i>	<i>69 hours tech</i>
	<i>65 hours RF</i>
	<i>16 hours RA</i>

2. If further material from all four samples were processed:

<i>Further processing</i>	<i>20 hours tech</i>
<i>Sorting</i>	<i>104 hours tech</i>
<i>Recording</i>	<i>40 hours RF</i>
	<i>12 hours RA</i>

To this should be added:

<i>Data entry and processing</i>	<i>10 hours RF</i>
<i>Writing technical report</i>	<i>35 hours RF</i>
	<i>8 hours RA</i>
<i>Contingency</i>	<i>4 hours tech</i>
	<i>4 hours RF</i>

<i>Total for preferred programme</i>	<i>124 hours tech</i>
	<i>89 hours RF</i>
	<i>20 hours RA</i>

Some compromise between these two courses is, of course, possible.

A modest quantity of reagents and other consumables would be required.

Duration of project

The critical path will be RF, with 65 hours (minimum programme) or 89 hours (preferred programme). Allowing for other known commitments, the maximum reasonable effort will be 30%, giving a project duration of 217 hours (5.79 weeks) or 297 hours (7.9 weeks). Allowing for the possibility that the work may span a period of leave, a duration of 8 or 10 weeks, respectively, should be allowed for.

Retention/disposal

The remaining sediment from the P1 samples should be retained pending further study, and vouchers from them set aside for long-term storage. There appears to be no reason to retain the low-priority samples in the long term.

Archive

Sample material and paper and electronic archives from this study are currently retained at the EAU.

References

Dainton, M. (1992). A quick, semi-quantitative method for recording nematode gut parasite eggs from archaeological deposits. *Circaea* **9**, 58-63.

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.

Kenward, H. K. (1992 for 1991). Rapid recording of archaeological insect remains - a reconsideration. *Circaea, the Journal of the Association for Environmental Archaeology* **9** (2), 81-8.

Kenward, H. K., Engleman, C., Robertson, A., and Large, F. (1986). Rapid scanning of urban archaeological deposits for insect remains. *Circaea* **3** (for 1985), 163-72.

Kenward, H. K., Hall, A. R. and Jones, A. K. G. (1980). A tested set of techniques for the extraction of plant and animal macrofossils from waterlogged archaeological deposits. *Science and Archaeology* **22**, 3-15.