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Reports from the Centre for Human Palaeoecology, University of York

Report **2003/06**

Assessment of insect remains from ten archaeological sites in Aberdeen

by

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17 July 2003

THE UNIVERSITY of York

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Summary

Numerous samples from excavations carried out over a period of years in Aberdeen have been assessed for their content of invertebrate macrofossils, especially insects. A substantial proportion of the samples were shown to contain assemblages of insects which will be of value in reconstructing Aberdeen's past at the context, site or inter-site level, and for comparison with the fauna of towns elsewhere in Britain. A phase of detailed recording and analysis is recommended.

KEYWORDS: ABERDEEN; MEDIEVAL; POST MEDIEVAL; MACRO-INVERTEBRATES; INSECTS; ASSESSMENT

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Kenward, H. (2003). Assessment of insect remains from ten archaeological sites in Aberdeen. *Reports from the Centre for Human Palaeoecology, University of York* **2003/06**, 11 pp.

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Introduction

Samples from a series of sites in Aberdeen, excavated over many years, were submitted by the Aberdeen Archaeological Unit for assessment of their potential value in developing a synthesis of bioarchaeological evidence from the medieval to early modern town. The samples had lain in storage in polythene bags, and many contained only a small amount of sediment: in consequence a proportion of the samples had dried out to a significant extent.

Methods

Following description and selection (on the basis of sample size and condition and the archaeological data), processing of the raw sediment was carried out by Palaeoecology Research Services, using methods described by Kenward *et al.* (1980). The subsample size employed varied greatly, from the entire sample of less than a kilogramme, to a maximum of 5 kg for samples thought on inspection likely to have a low concentration of remains. A further stage of selection was carried out by Dr Allan Hall, who rejected any subsamples which were found to be barren of invertebrate remains during examination for plant macrofossils.

Insects in the flots were recorded using 'assessment recording' *sensu* Kenward (1992), creating a list of the taxa observed during rapid inspection of the flot, with an estimate of abundance, and a subjective record of the main ecological (e.g. aquatics, grain pests) or indicator (e.g. for stable manure, Kenward and Hall 1997) groups present. A record of the preservational condition of the remains was made using scales given by Kenward and Large (1998).

Results

Most of the subsamples yielded at least modest numbers of insects, and in some they were quite abundant. Beetles were generally the most numerous, with fly puparia frequent in a few cases. Almost all samples yielded some mites (Acarina), which were occasionally abundant. Preservation varied from good to very poor, with a substantial proportion of the assemblages showing varied decay states and a good deal of fragmentation; whether this degradation occurred in the ground (and if so whether in antiquity or recently) or in store is uncertain. Remains were generally identifiable, however, except where extremely comminuted. A few assemblages consisted only of almost completely decayed scraps of cuticle. The weight of sediment processed, size of resulting flot, and abundance, preservation, and general character of the insect assemblages are given in Table 2.

Three ecological groups predominated across most of the assemblages: occupation-site fauna including 'house fauna', species favoured by foul matter; and a range of taxa which were probably imported in peat or turf sods. Aquatics, usually beetles but sometimes also the resting eggs of water fleas (Cladocera), were usually present in small numbers, though it was not often clear whether they belonged to the last of these major categories, or of some other origin (background fauna, imported water, or via faeces, having been accidentally ingested with contaminated water). Some samples contained more dung beetles than might be expected as part of the 'background rain'; they may have had a local origin (attracted to faeces on the sites), or have arrived in turf sods from grazed land.

Some assemblages included components of the stable manure 'indicator group' put forward by Kenward and Hall (1997). More detailed analysis, together with a full integration of plant and insect

data, should confirm the presence of this material, historically abundant in some other towns, in the deposits in Aberdeen.

Only a trace of grain beetles was noted, but the characteristic spider beetle *Tipnus unicolor* (Piller and Mitterpacher) was rather frequent: it is particularly typical of later and post-medieval occupation sites and may have considerable implications concerning the quality of buildings. A few bean weevils (*Bruchus* sp., probably *rufimanus* Boheman) perhaps originated from food.

Two samples from E38 Context 549 (a 'sump fill') gave small but unusual assemblages, with (on the basis of inspection of part of the flot in each case) abundant woodworm beetles, *Anobium punctatum* (Degeer). The nature of this deposit requires careful evaluation.

Fragments of fleas were present in several samples, and an abdomen in one, but no heads (the most easily identifiable part). However, heads are easily overlooked during assessment, when flots cannot be examined as meticulously as during detailed analysis. A few lice were present (probably *Pediculus humanus* Linnaeus, the human louse, but confirming this requires closer examination).

Recommendations

Recommendations for further analysis are given in Table 2. Many of the samples deserve detailed recording, to amplify context interpretation or to gather data or analysis at the site or town level: certainly those afforded priority P1A or P1B should be recorded, but the P2 samples would provide useful data for higher-level analysis of site statistics. Any samples related to those found productive, but not included in the assessment to avoid duplication, might usefully be examined too.

A species association analysis (Carrott and Kenward 2001) of data from all of the insect analyses made for sites in Aberdeen (i.e. including those described by Kenward and Hall 2001 as well as those recommended here) would be worthwhile, as it might clarify, or at least illustrate, the various origins of the components of the fauna. It might, for example, show whether dung beetles were associated with peat/turf fauna or with occupation-site foul decomposers: in the former case, importation of turves from grazed land would be assumed, whereas in the latter *in-situ* colonisation would appear probable. Analyses of this kind have proved productive elsewhere (e.g. for Roman Carlisle, Kenward 1999, and for the rath site at Deer Park Farms, Co. Antrim, Ireland, Allison *et al.* 1999 a, b).

Acknowledgements

I am grateful to Allan Hall (University of York), Alison Cameron (Arts and Recreation, Aberdeen City Council), and John Carrott (Palaeoecology Research Services). The work was carried out with permission from English Heritage.

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Table 1. The sites in Aberdeen from which material was assessed.

Site code	Name
E15	No 3 Bonded Warehouse, Virginia Street
E19	Carmelite Friary
E21	43-57 Upperkirkgate
E34	Gallowgate Middle School
E35	16-18 Nether Kirkgate
E37	Castle Street
E38	Carmelite Friary
E45	St Clements Street
E47	Shiprow
E58	Dunbar Hall

Table 2. Assessment of insect (and other macro-invertebrate) remains from sites in Aberdeen. Key: CN - context number; SC - site code; SN - sample number (all suffixed /T in records); Wt - weight (in kilogrammes). Priority: P1A - important as a characteristic group, for context interpretation and for site-level statistics; P1B - for context interpretation and for site-level statistics; P2 - some; P3 - limited value for context interpretation, but useful for site-level statistics; NFA - no further action recommended. Some samples were found to be barren of invertebrates during assessment for plants by Dr Allan Hall (AH). Spot samples examined for plant remains have not been included unless they contained appreciable numbers of insects.

SC	CN	SN	Context type, date	Wt	Assessment notes	Action needed
E15	1	1	Floor, 17th-18th C	1.56	No invertebrates observed (AH)	NFA
E15	26	26	midden, 14th-15th C	2.024	Small flot, fine fibres (?hair) and yellowed plant debris. Invertebrates often very decayed (E 2.5-5.0, mode 4, weak; F 2.5-5.0, mode 3.5 weak; trend to yellow 1-4, mode 3 distinct). Numerous mites and puparia, small beetle group indicating litter such as stable manure.	Record, preferably using additional subsample. P1B.
E15	103	103	posthole fill 103AV, late 12th-13th	3.08	A few beetle fragments and trace of decayed cuticle from plant analysis.	NFA.
E19	269	269	fill in pit in church, Phase 1, 13th C	2.05	No invertebrates observed (AH)	NFA
E19	276	276	burnt area DT within church, Phase 1	0.3	No invertebrates observed (AH)	NFA
E19	279	279	pit fill in DU, Phase 1	1.226	No invertebrates observed (AH)	NFA
E19	314	314	fill of stone feature EC, Phase 2	1.1	No invertebrates observed (AH)	NFA
E19	315	315	lower fill of pit DH, Phase 1	1.68	No invertebrates observed (AH)	NFA
E19	320	320	layer in stone feature EC, Phase 3, 16th-17th C	0.662	Trace flot, only two insect fragments.	NFA
E19	322	322	fill in stone feature EC, Phase 2	1.1	No invertebrates observed (AH)	NFA
E19	323	323	fill in stone	1.1.5	No invertebrates observed (AH)	NFA

SC	CN	SN	Context type, date	Wt	Assessment notes	Action needed
			feature EC, Phase 2			
E19	324	324	fill in stone feature EC, Phase 2	0.43	No invertebrates observed (AH)	NFA
E19	10041	10041	coffin remains DA, Phase 2c	1.48	No invertebrates observed (AH)	NFA
E21	-	-	-		10 samples examined: no invertebrates observed (AH)	NFA
E34	14	34	midden, late 12th-13th C	2.480	Small flot, woody and herbaceous plant debris. Insect group of modest size; many very pale (E2.0-4.5, mode 3.0 weak; F 2.0-5.0, mode 2.5, weak; trend to pale 1-4, mode 3 weak). Ecologically mixed, occupation fauna and perhaps a turf component?	Record (additional subsample would be useful). P1B.
E34	22	28	midden deposit, late 12th-13th C	3.0	Modest-sized flot. Abundant beetles and bugs, though most battered (E 1.5-4.5, mode 3.0 weak; F 2.0-4.0, mode 2.5 weak).Clear 'house fauna' component, but also peat or turf.	Worth recording despite fragmentation. P1A.
E34	33	37	pit fill in BG, 13th-14th C	2.2	Small flot, plant and fly puparial fragments and a few beetles, most very decayed (E 3.5-5.0, mode 4.0 distinct; F 3.0-5.0, mode 4.0, weak; trend to pale 3-4, mode 3 weak). Small mixed beetle group, with no interpretative potential.	NFA
E34	60	13	organic fill of barrel BN, late 14th C	3.0	Smallish flot. Useful numbers of insects, especially beetles. Preservation variable, mainly poor, but remains identifiable (E2.5-5.5, mode 3.5 weak; F 2.0-4.0, mode 2.5 weak). House fauna (including many *Tipnus unicolor*), foul decomposers and heath/moor taxa.	Notable group which should be recorded. P1A
E34	70	3	midden deposit, late 12th-13th C	3.0	Flot moderately large, mostly insect fragments. Preservation fairly good (E 2.0-3.5, mode 3.0 weak; F 1.4-4.0, mode 3.0 weak). Rich fauna, range of ground beetles, decomposers, plant feeders; primarily natural fauna: heathland, aquatics.	Characteristic peat/turf group. Record. P1A
E34	81	2	midden, 12th-13th C	3.0	Flot moderate size; useful numbers of insects, generally quite well preserved (E2.0-4.0, mode 2.5 weak; F 2.0-4.0, mode 2.0 weak).	Record (ideally with additional subsample). P1B.

SC	CN	SN	Context type, date	Wt	Assessment notes	Action needed
					Ecologically mixed, aquatics, decomposers, peat/turf components. *Aglenus brunneus*, *Tipnus unicolor*.	
E34	83	1	midden deposit, late 12th-13th C	3.0	Smallish flot, with useful group of variably preserved insects (E2.0-4.0, mode 2.5 weak; F 2.0-4.0, mode 2.5 weak). Occupation site decomposers and small peat/turf component.	Record (ideally with additional subsample). P1B.
E34	84	21	fill in leather-workers' pit CT, late 12th-13th C	3.0	Smallish flot, mostly insects, some bark and fine plant debris. Preservation often poor (E 2.5-5.0, mode 3.0 weak; F 2.0-5.0, mode 3.0, weak). Modest numbers of insects, from occupation site habitats and strong peat/turf group.	Record (preferably with additional subsample). P1B.
E34	85	5	midden, 12th-13th C	3.0	Small flot; smallish group of insects with variable, often poor, preservation (E 1.5-5.0, mode 3.0 distinct; F 2.0-4.0, mode 2.5 weak). Peat/turf and occupation site fauna.	Record for site-level analysis. P2.
E34	88	17	midden, lae 12th-13th C	3.0	Flot of moderate size: woody and herbaceous detritus and insect fragments. Insect preservation variable, generally a little poor (E 3.0-4.0, mode 3.5 weak; F 2.5-3.5, mode 3.0 weak; trend to pale 2-3, mode 3 weak). Subjectively different fauna from most samples reviewed here: perhaps 10 *Aphodius ?contaminatus* and *?prodromus*; some occupation site fauna but mostly outdoor forms. Imported grazed turf or of local origin?	Record. Preferably used additional subsample to confirm character. P1A.
E34	104	16	fill in leather-workers' pit CT, late 12th-13th C	3.0	Flot of modest size with quite large numbers of insects; preservation average (E 2.5-3.5, mode 3.0 weak; F 1.5-3.5, mode 2.5 weak). Mixed fauna, turf/peat, water, occupation site decomposers. Perhaps three *Aphodius* species.	Record (perhaps with additional subsample). P1B.
E34	107	27	fill in leather-workers' pit CT, late 12th-13th C	3.0	Flot a little large; woody plant debris and useful quantities of insects. Preservation very to moderately good (E 1.5-3.0, mode 2.0 weak; F 2.0-4.0, mode 3.0 weak). Mostly decomposers, perhaps somewhat foul conditions. Hints of house fauna (including *Tipnus unicolor*) and peat/turf	Record. P1A.

SC	CN	SN	Context type, date	Wt	Assessment notes	Action needed
					fauna.	
E34	111	15	fill of pit DA, 13th-14th C	3.0	Flot moderately large, mostly ?monocotyledon rhizome debris, and insects and mites. Small group of insects, preservation often good (E 1.5-3.5, mode 2.5 distinct; F 1.0-3.5, mode 2.5 weak), with occupation site and heath/moor components.	Record, ideally using additional subsample. P1B.
E34	233 EU	29	pit fill, Context 233EU, late 12th-13th C	5.0	Flot quite large, with moss, plant debris and obvious insects. Smallish group of beetles, often quite well preserved (E 1.5-3.5, mode 2.5 weak; F 2.0-4.0, mode 2.5 weak), with hints of foul matter, e.g. three *Aphodius (prodromus* and *contaminatus*).	Record, preferably needs additional subsample to confirm numbers of *Aphodius*. P1B.
E35	18	8	Context AH, Area B: turf stack, 13th-14th C	3.0	Flot quite large, with well-decayed plant debris and moss. Useful group of insects, fairly well preserved (E 2.5-3.5, mode 3.0 weak; F 2.5-4.0, mode 2.5 weak). Mixed turf/peat and occupation site fauna.	Record, ideally with additional subsample. P1B.
E35	37	22	Area B, midden, 13th-14th C	3.0	Large flot, fairly coarse plant debris. Needs careful sorting, but useful group of insects. Preservation variable, mostly good (E 1.0-4.0, mode 1.5 weak; F 1.5-3.5, mode 1.5 weak). Indications of very foul conditions. Possibly includes cut vegetation or fresh turf/surface peat?	Record. P1B.
E35	109	16	Area C, midden, 13th-14th C	3.0	Large flot, primarily herbaceous detritus. Rich and varied insect group, mostly well preserved (E 1.5-3.0, mode 2.5 weak; F 2.0-3.5, mode 2.5 weak). Three *Aphodius* species, rich outdoor component, probably turf/peat fauna,	Record, ideally with additional subsample (though with implications for sorting time). P1B.
E35	119	30	Area B, midden, 13th-14th C	3.0	Flot of modest size, with well-decayed plant debris and quite large numbers of insects. Preservation generally good (E 1.5-2.5, Mode 2.0 weak; F 2.0-3.0, mode 2.5 weak. Perhaps house fauna (including *Tipnus unicolor*); foul decomposers including three *Aphodius* species; smallish outdoor group.	Record, perhaps with additional subsample. P1A.
E35	306	26	Area C,	3.0	Small flot, modest-sized group of	Record, ideally

SC	CN	SN	Context type, date	Wt	Assessment notes	Action needed
			Context 306 BU, midden, 13th-14th C		variably-preserved insects (E 2.0-4.5, mode 3.0 weak; F 2.0-3.5, mode 2.5 weak). Hints of peat/turf but primarily occupation-site fauna, including *Bruchus ?rufimanus* (pulses) and human or pig lice. Segment of hydroid 'stalk' resembling *Eudendrium* or *Obelia*.	with additional subsample. P1A.
E35	482	1	Area E, Context 482 KM, pit fill, 13th-14th C	3.0	Smallish flot, containing very few, poorly preserved, insects, including unidentifiable scraps of cuticle (E 4.5-5.5, Mode 5.5 weak; F 4.0-5.5, mode 5.0 weak).	NFA.
E37	396	7	quarry pit fill in 396GG, 13th-14th	1.0	No invertebrates observed (AH)	NFA
E38	61	44	pit fill in BI, Phase 3	0.772	Trace flot with no recognisable invertebrate remains.	NFA.
E38	342	33	loam (general layer), Phase 5	1.208	No invertebrates observed (AH)	NFA
E38	393	30	pit fill in HD, Phase 2a	1.84	Flot of modest size, mostly plant debris (especially moss), with a smallish group of variably preserved insects (E1.5-4.0, mode 3.0 weak; F 1.5-4.0, mode 3.0 weak). Mixed fauna, perhaps indications of foul matter; *Bruchus* sp.	Record, preferably with additional subsample. P1B.
E38	549 KV	47	sump fill in KV (?549), Phase 7	1.310	Large flot, only part examined. Small group of insects but worth recording as characteristic (as Sample 50). E 2.5, F 1.5.	Record. P1A.
E38	549 KV	50	sump fill in KV (?549), Phase 7	1.952	Large flot, only part examined. Small group of insects but worth recording as characteristic, with abundant *Anobium punctatum*. E 2.5, F 1.5.	Record. P1A.
E38	645	24	organic deposit in water channel LU, Phase 1	1.274	Trace flot, entirely strongly yellowed. Only a single earthworm egg capsule.	NFA.
E38	863	13	grave soil ND, Phase 5	5.0	Smallish flot, with plant debris but large proportion of insects. Preservation fairly good (E 2.0-3.5, mode 3.0 weak; F 2.0-4.0, mode 2.5 weak). Small ecologically varied but rather characteristic beetle assemblage including	Record. P1A.

SC	CN	SN	Context type, date	Wt	Assessment notes	Action needed
					Bruchus sp.	
E38	864	27	black organic layer, Phase 6	0.986	Flot of moderate size; mostly granular charcoal or burnt soil. Very eroded scraps of insect (E 5.5, F 5.0).	NFA.
E38	929	70	soil in church, Phase 5	2.205	Small flot, mostly charcoal with mica and rotted plant fragments. Only a few very decayed insect scraps (E5.5)..	NFA.
E38	113 88	40	pit fill ND, Phase 5	-	Spot sample: a few insects from plant analysis.	NFA.
E45	11	11	organic layer in sand dune (?Context 398)	3.0	No invertebrates observed (AH)	NFA
E45	13	13	organic layer in sand dune (?medieval)		No invertebrates observed (AH)	NFA
E47	15	15	pit AD, layer 15: 12th C oven or kiln	1.0	No invertebrates observed (AH)	NFA
E47	25	25	pit AD, layer 25: 12th C oven or kiln	1.0	No invertebrates observed (AH)	NFA
E47	34	34	pit AD, layer 34: 12th C oven or kiln	1.0	No invertebrates observed (AH)	NFA
E47	96	96	fill of shallow oval cut AK/AL	2.0	No invertebrates observed (AH)	NFA
E58	3	3	pit fill, 13th-14th C	1.484	No invertebrates observed (AH)	NFA
E58	5	5	pit fill, 13th-14th C	1.274	No invertebrates observed (AH)	NFA
E58	6	6	pit fill, 13th-14th C	1.208	No invertebrates observed (AH)	NFA
E58	99	99	ditch fill in AF, ?medieval	2.056	No invertebrates observed (AH)	NFA