114-119 St Aldates and 4-5 Queen Street, Oxford: Insect remains from occupation deposit 10013

(Site code OXSTAD16)

Enid Allison

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INTRODUCTION

Excavations by Oxford Archaeology South (OAS) at 114-119 St Aldates and 4-5 Queen Street, Oxford (NGR SP 51320 06130) mainly provided evidence of medieval occupation and activity in one of the oldest and grandest parts of the city. During the 12th and 13th centuries the site formed part of the Jewish quarter of Oxford and two of the more substantial land holdings, corresponding approximately with 114-119 St Aldates, were in Jewish ownership. Two smaller properties held by the Bishop of Lichfield fronted onto Queen Street. By the 14th century all the properties were under Christian control following the expulsion of Jews from England in 1290. The types of deposits and features uncovered are consistent with backyards in which refuse from a succession of properties was dumped (Teague 2017).

One sub-sample from a waterlogged occupation deposit (10013) assigned to the 13th to 14th century (Phase 4) was submitted for examination of insect remains.

METHODS

The sub-sample had a volume of two litres and was received having been wet-sieved to 0.25mm by OAS. Paraffin flotation to extract insect remains was carried out following Kenward *et al*. (1980) with recovery on 0.3mm mesh. Beetle (Coleoptera) sclerites were removed from the paraffin flot onto moist filter paper for examination under a low-power stereoscopic zoom microscope (x10 – x45).

Identification was by comparison with modern insect material and reference to standard published works. Numbers of individuals and taxa of beetles and bugs were recorded, and taxa were divided into broad ecological groups for interpretation (Kenward *et al*. 1986, Kenward 1997, Smith *et al*. in prep.). Nomenclature of Coleoptera follows Duff (2018). Abundances of other invertebrates, including insects other than beetles and bugs, were recorded semi-quantitatively on a four-point scale as: + occasional; ++ moderately frequent; +++ frequent; ++++ abundant.

THE INSECT ASSEMBLAGE

Context 10013, sample <10000> [Occupation deposit]

The proportions of various ecological groups of insects in the assemblage are shown in Table 1, and a full list of insects and other invertebrates in Table 2.

The deposit had clearly contained a significant amount of cess. The most numerous insect remains were fly (Diptera) puparia, the dominant species being *Thoracochaeta zosterae* which is particularly characteristic of medieval cess deposits even though its natural habitat appears to be in wet decaying seaweed (Belshaw 1989; Webb *et al*. 1998). Huge numbers of *T. zosterae* were recorded in a 13-14th century cess pit excavated by the Oxford Archaeological Unit at 113-119 High Street, for example (Webb *et al*, 1998). The species appears to be indicative of cesspits containing foul matter graduating from saturated to damp

through to drier conditions (Smith 2013). Spiracles of rat-tailed maggots (the larvae of a hoverfly (Syrphidae), probably *Eristalis tenax*) were common, these being characteristic of foul standing liquids.

Beetles were well-represented (a minimum of 214 individuals of 47 taxa, a concentration of >100 individuals per litre), and a large proportion (75%) were synanthropes. The rove beetle *Creophilus maxillosus* is a predator typically found in carrion but it would probably also exploit other habitats rich in fly larvae (Lott and Anderson 2001, 252). Several *Bruchus* ?*rufimanus* are likely to have arrived directly in faeces adding to evidence for diet. The larvae develop within medium and large legume seeds, especially in field beans (Hoffman 1945, 43) and they were frequently consumed within infested pulses. The beetles survive passage through the gut well, and in archaeological contexts the presence of their remains is generally characteristic of faeces (e.g. Smith 2013). No pulses were noted among the plant remains from this sample (Giorgi, plant report) but this is not unusual in waterlogged deposits since legume seeds that are neither charred nor mineralised do not preserve well (e.g. Allison and Hall 2001; Carruthers and Allison 2015).

Almost half of the beetles (47%) consisted of taxa that are characteristic of litter from ancient houses or other buildings (Hall and Kenward 1990; Kenward and Hall 1995; Carrott and Kenward 2001). Such material appears to have been used in many cess-containing features, perhaps to reduce odours. It is also possible that some taxa within this group lived in the drier parts of cess deposits or in associated structures. The group was dominated by *Epauloecus unicolor* (formerly *Tipnus unicolor*) found in damp mouldy debris (O'Farrell and Butler 1948), on its own accounting for a fifth of the whole beetle assemblage. Archaeological evidence suggests that this spider beetle is particularly characteristic of long-lived high-quality buildings, with the proportion increasing with general cleanliness (Kenward 2009, 309). Other members of the building fauna included *Ptinus* ?*fur*, *Tenebrio obscurus*, *Blaps*, *Xylodromus concinnus*, *Latridius minutus* group, *Cryptophagus* spp., *Atomaria* spp., *Aglenus brunneus* and *Mycetaea subterranea*. Modern records of *Mycetaea subterranea* are mainly from decaying straw and wood in dry cellars, barns and stables and in association with the dry rot fungus *Merulius lacrymans* (Hinton 1945, Palm 1959). Woodworm (*Anobium punctatum*) and death watch (*Xestobium rufovillosum*) beetles were probably also associated with the building fauna. Death watch beetle primarily infests oak timbers that have been subject to microbial attack following exposure to damp.

Distinguishing the types of buildings that litter might have come from is often not possible, since from a beetle's point of view human dwellings with floors strewn with cut vegetation or other organic litter, would have included many of the same habitats as stables. Here, ectoparasites provided a hint that at least some of the litter was from human habitation: human louse (*Pediculus humanus*) can exist only in close proximity to man, although human flea (*Pulex irritans*), while primarily associated with human dwellings, can sometimes be found in buildings occupied by domestic animals (Smit 1957; George 2008, 14).

Stable waste can often be identified if several characteristic groups of insects are present, namely a fauna from within buildings, grain pests, insects either collected with hay or exploiting it in storage, and decomposers living in foul, open-textured nutrient-rich material (Kenward and Hall 1997). Two species of grain pests were recorded (*Sitophilus granarius*, *Oryzaephilus surinamensis;* 4% of the assemblage) and the numbers are probably

not high enough to indicate the dumping of spoiled cereals. In deposits interpreted as dumps of spoiled grain, the pest species often make up over 50% of the insect fauna (Smith and Kenward 2012). While an origin in human faeces is possible, is probably unlikely in this case since the cereal bran is indicative of finely milled flour (Giorgi, plant report) and the beetles are largely represented by complete undamaged sclerites. It may therefore be more likely that the grain pests arrived with stable litter or straw containing a residue of grain. The saw-toothed grain beetle (*0. surinamensis*) is particularly found in damp, mouldy cereals, and poor quality grain is more likely to have been used for animal feed rather than for human consumption. The plant remains have provided convincing evidence for the presence of a residue from hay in this deposit (Giorgi, plant report) and the beetles *Typhaea stercorea* and *Omonadus floralis* or *formicarius* are suggestive of mouldering hay. S*itona* and an ?apionid weevil, the only two plant-feeding taxa in the assemblage, are both common in grassland habitats and are often found with other insects where hay is suggested (Kenward 2009, 289). Decomposers associated with foul matter, typically dung, were very poorly represented, however (a single specimen of *Platystethus arenarius*; <1% of the assemblage), but it is possible that this might simply reflect the rapid and regular clearance of manure from stables, perhaps on a daily basis, leaving insufficient time for substantial populations of foul decomposers to develop.

There was hardly any unequivocal evidence for an outdoor component in the beetle assemblage (i.e. taxa not usually found within buildings or in accumulations of decomposing organic material), although *Lesteva longoelytrata* and *Dryops* may suggest damp ground and wet muddy conditions. The general lack of outdoor taxa suggests that the material making up the deposit had accumulated under closed conditions.

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Table 1

Proportions of beetles from different ecological groups

Ecological codes shown in square brackets are explained in Table 2

Total individual adult beetles	214
% Dry decomposers [rd]	41%
% Foul decomposers [rf]	<1%
% Eurytopic decomposers [rt]	32%
% Total decomposers [rd+rf+rt]	73%
% Aquatics [w]	0%
% Damp ground taxa [d]	1%
% Plant-associated taxa [p]	1%
% Outdoor taxa [oa]	2%
% Grain pests [g]	4%
% Wood/timber taxa [l]	3%
% House/building fauna [h]	47%
% Strong synanthropes [ss]	38%
% Typical synanthropes [st]	15%
% Facultative synanthropes [sf]	21%
% Total synanthropes [ss+st+sf]	75%

Table 2

Insects and other invertebrates recorded from the samples

Ecological codes shown in square brackets are: d - damp ground/waterside, g - grain pests, h - house/building, l - wood/timber, oa - outdoor taxa not usually found within buildings or in accumulations of decomposing matter, p- plant-associated, rd - dry decomposers, rf - foul decomposers, rt - eurytopic decomposers, sf - facultative synanthropes, ss - strong synanthropes, st - typical synanthropes, u - uncoded. Abundance of taxa other than beetles and bugs has been recorded on a four-point scale as follows: occasional +, moderately frequent ++, frequent +++, abundant ++++

Context	**10013**
Sample	**<10000>**
Sub-sample volume	2L
INSECTA	
PHTHIRAPTERA (lice)	
Pediculus humanus Linnaeus	+
COLEOPTERA (beetles)	
Hydrophilidae	
Cercyon sp. (decomposer group) [rt]	1
Histeridae (clown beetles)	
Histerinae sp. [rt]	3
Histeridae sp. [u]	1
Staphylinidae (rove beetles)	
Phyllodrepa floralis (Paykull) [rt-sf]	7
Omalium ?*allardii* Fairmaire & Brisout de Barneville [rt-sf]	30
Xylodromus concinnus (Marsham) [rt-st-h]	4
Lesteva longoelytrata (Goeze) [oa-d]	1
Aleochariinae spp. [u]	15
Platystethus arenarius (Geoffroy in Fourcroy) [rf]	1
Anotylus complanatus (Erichson) [rt-sf]	1
Anotylus rugosus (Fabricius) [rt]	1
Oxytelus sculptus Gravenhorst [rt-st]	1
Gyrohypnus sp. [rt]	1
Creophilus maxillosus (Linnaeus) [rt]	1
Bisnius or *Philonthus* spp. [u]	16
Staphylininae spp. indet. [u]	2
Dryopidae (long-toed water beetles)	
Dryops sp. [oa-d]	1
Dermestidae (larder beetles)	
?Dermestidae sp. [rt-sf]	1
Ptinidae (spider and woodworm beetles)	
Epauloecus unicolor (Piller and Mitterpacher) [rd-ss-h]	42
Ptinus ?*fur* (Linnaeus) [rd-st-h]	4
Xestobium rufovillosum (De Geer) [l-sf-h]	1
Anobium punctatum (De Geer) [l-sf]	5
Monotomidae	
Monotoma sp. indet. [rt-st]	1
Silvanidae	
Oryzaephilus surinamensis (Linnaeus) [g-ss]	6
Cryptophagidae (silken fungus beetles)	

Cryptophagus scutellatus Newman [rd-st-h]	2
Cryptophagus sp. [rd-st-h]	7
Atomaria spp. [rd-st-h]	4
Endomychidae (handsome fungus beetles)	
Mycetaea subterranea (Fabricius) [rd-ss-h]	18
Latridiidae (minute brown scavenger beetles)	
Latridius minutus group [rd-st-h]	6
Dienerella sp. [rd-sf]	3
Corticariinae spp. [rt]	4
Mycetophagidae (hairy fungus beetles)	
Typhaea stercorea (Linnaeus) [rd-ss-h]	1
Tenebrionidae (darkling beetles)	
Tenebrio obscurus Fabricius [rt-ss-h]	1
Blaps sp. [rt-ss-h]	1
Salpingidae	
Aglenus brunneus (Gyllenhal) [rt-ss-h]	10
Anthicidae (ant-like flower beetles)	
Omonadus floralis or *formicarius* (Goeze) [rt-st]	1
Chrysomelidae (seed and leaf beetles)	
Bruchus ?*rufimanus* Boheman [st]	4
Apionidae	
?Apionidae sp. [oa-p]	1
Dryophthoridae	
Sitophilus granarius (Linnaeus) [g-ss]	3
Curculionidae (weevils)	
Sitona sp. [oa-p]	1
DIPTERA (flies)	
Syrphidae sp., probably *Eristalis tenax*, larval spiracular processes	+++
Diptera spp. fragments	+++
Diptera spp. puparia	++++
HYMENOPTERA (bees, wasps and ants)	
Formicidae spp.	+
Hymenoptera Parasitica spp.	+
SIPHONAPTERA (fleas)	
Pulex irritans Linnaeus	+
Siphonaptera sp. indet. leg segments	+
Insecta spp. indet. larval fragments	+++
ARACHNIDA	
Acarina spp. (mites)	++++
Pseudoscorpiones sp. (pseudoscorpions)	+
TOTAL ADULT BEETLE INDIVIDUALS	214