Centre for Human Palaeoecology
Department of Archaeology
The King's Manor, York YO1 7EP

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Technical report: Insect and other invertebrate remains from an early 11th century settlement at Viborg Søndersø, Denmark

by

Harry Kenward

Centre for Human Palaeoecology, Department of Archaeology, University of York, The King's Manor, York YO1 7EP

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Harry Kenward

Address: Harry Kenward, Department of Archaeology, University of York, The King's Manor, York YO1 7EP UK. Telephone: 01904 433905; email hkk1@york.ac.uk

Summary

A series of samples from deposits formed in the first quarter or third of the 11th century at the Søndersø site in Viborg, Denmark, have been analysed for their content of invertebrate remains, principally insects, as part of an integrated research project. An assessment had generated a series of specific questions, and analysis was largely targeted towards these, although other samples shown by further assessment to be of interest were also recorded. There were at least a few insect remains in all of the deposits, and although their concentration was often low and preservation sometimes poor, a substantial amount of information could be extracted. The component of insects favoured by human occupation (synanthropes) was rather limited, suggesting intermittent or short-term, probably non-domestic, use of the site. There were, however, a few fleas and lice. Records of the beetle Trox scaber suggested leather processing, or perhaps stored skins. The insects gave little indication of flooding (something suggested by some other evidence). There was a range of remains which appeared likely to have been imported in moss and cut herbaceous vegetation. The evidence generally accorded well with that from plant remains, parasite eggs, bones and other vertebrate remains, and also that from excavation and finds analysis. The findings will be published in Iversen, Mette, David Robinson, Jesper Hjermind & Charlie Christensen (eds.) (2005). Viborg Søndersø II. Arkæologi og naturvidenskab i et værkstedsområde fra det tidlige 1000-tal (= Jysk Arkæologisk Selskabs Skrifter*). Højbjerg.*

KEYWORDS: DENMARK; VIBORG; SØNDERSØ; INSECT REMAINS; EARLY MEDIEVAL

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Introduction

The medieval town of Viborg was extensively excavated in 1981-85 (Hjermind *et al.* 1998). During 2001 a further phase of excavation was carried out at the Søndersø site, with a series of explicit research objectives which included the full integration of multiple lines of evidence. On dendrochronological evidence the deposits formed in the first quarter or third of the 11th century. They represent structures and external layers, and are believed to have formed in or near to what was already an urban area, although perhaps very recently established. On excavational evidence, the structures recorded at the present site appear to have been workshops rather than dwellings. A range of crafts were carried out, and there seem to have been pens for livestock, some deposits being interpreted as animal manure.

A substantial number of samples were collected during excavation for later bio-archaeological analysis. In 2002, one-kilogramme subsamples from 25 of these were submitted for assessment of their content of invertebrate remains, especially insects. Many of the samples were found to be rich in interpretatively-useful remains, and a main phase of analysis was recommended (Kenward 2002). The assessed samples were assigned priorities, though it was suggested that as many as possible should be subjected to detailed analysis in order to obtain a range of information concerning ecological (and thus human living) conditions at the site, activity, and deposit formation processes. Particular problems which were identified (in addition to any driven by the excavation record and other lines of post-excavation work, and to be integrated with other evidence) included:

- why was the input of insect remains so low for many of the deposits? Is this related to 'industrial' use?
- why was synanthrope diversity (apparently) so low at Viborg?
- reconstruction of vegetation and land use at earliest stage prior to construction of the building.
- were honey bees regular and frequent enough in the deposits to suggest beekeeping? Was there beeswax in the samples (see Kenward and Hall 1995, 765-767)?
- was the concentration of *Trox scaber* found in one layer in some way related to the storage or processing of skins?
- could the insect remains provide clearer evidence of the importation of materials, perhaps turf and cut vegetation?
- why were so few ectoparasites of humans or livestock recorded?

The importance of integration and feedback, with other evidence, especially with botanical results, was reiterated. Some other specific questions emerged subsequently, including determining whether the aquatic plants and invertebrates (insects, cladocerans) in the deposits hade been deposited by flooding or introduced by human activity.

Assessment showed that the concentration of invertebrate remains, and of adult beetles and bugs in particular, in the deposits was generally low, so it was recommended that larger subsamples than those of 1.0 kg used in assessment should be processed in the main phase of analysis. Unfortunately this was not always possible, and this limited results to some extent. Nevertheless, a great deal has been learned about the site from those analyses which have been carried out.

Twenty-five assemblages were recorded during the assessment. In the main phase of analysis reported here, 25 invertebrate assemblages were recorded in detail, and a further 9 assessed but not fully recorded through time constraints. Archaeological priority over-rode that assigned on the basis of the

insect remains, so that some 'Priority 1' assemblages identified in the assessment have not been fully analysed. In other cases, insufficient (or no) sediment remained for the recovery of an assemblage large enough for a detailed analysis. The results of the assessment are incorporated into this report, which gives a rather detailed account of each of the sample assemblages for reference purposes.

Methods

Practical methods

For the main phase of analysis, samples were selected for extraction of invertebrate remains following priorities (a) assigned by the excavators and (b) based on the results of the assessment. Some samples were too small to provide useful quantities of insect remains, and this influenced the selection process in some cases. Main-phase processing was carried out by Palaeoecology Research Services, Shildon, Durham. In the laboratory, a record was made of their lithology, using a standard *pro forma*. Where possible, 3kg of sediment was processed; where less sediment was available, it was all processed apart from a small subsample retained as a 'voucher'. The sediment was sieved to 300 μm, and invertebrate macrofossils recovered using procedures broadly following the paraffin (kerosene) flotation method described by Kenward *et al*. (1980; 1986). In some cases during the assessment a stage of 'wet paraffin flotation' was applied in the hope of recovering larger numbers of delicate remains in an undamaged state. This procedure involves shaking or stirring the gently sieved sample as a slurry with water and paraffin. The flots were examined for invertebrate remains.

During the main phase of analysis, most assemblages were recorded at the 'detailed' level of Kenward (1992), an attempt being made to identify all adult beetles and bugs as far as practicable, the parts recovered being recorded to enable estimation of the minimum number of individuals (MNI) represented. Remains were identified in the flot (for familiar species) or placed on damp filter paper for more careful inspection where necessary. Adult beetles and bugs from some samples were nominally recorded at the 'assessment' level of Kenward (1992), although in practice a fuller record, approximating to 'semi-quantitative rapid scanning' was made to enable inclusion in the database record, albeit often at an approximate level of quantification and identification. For assessment, all remains were generally recorded using a semi-quantitative scale of 1, 2, 3, 'several' (translated as 6), 'many' (15), with estimates for very large numbers; fossils other than those of adult beetles and bugs were generally quantified in this way for the main phase. This system of semi-quantitative recording, and the wisdom of calculating assemblage statistics from the lists created by it, are discussed by Kenward (1992). Quality of preservation was recorded using the scales of Kenward and Large (1998). In summary, preservation was recorded as chemical erosion (E) and fragmentation (F), in each case on a scale from 0.5 (in superb condition) to 5.5 (extremely decayed or fragmented). Data were recorded on a *pro forma* and subsequently transferred to *Paradox* tables. Assessment lists have been entered as 'rapid scans' in the classification of Kenward (1992), so that approximate main statistics could be generated.

In one case a 'squash' (*sensu* Dainton 1992) was made to test for the presence of eggs of intestinal parasites.

Interpretative methods

The interpretative methods employed were essentially the same as those used in work on a variety of sites by Hall, Kenward and co-workers (see Kenward 1978, with modifications outlined by, for example, Kenward 1982; 1988; Hall and Kenward 1990; and Kenward and Hall 1995). Interpretation rests primarily on a number of 'main statistics' of whole assemblages of adult beetles and bugs, and on the recognition of ecologically-related groups of species. The main statistics used include: (a) a measure of species-richness (or diversity), α of Fisher *et al*. (1943), for the whole assemblage and for

components of it; and (b) proportions of 'outdoor' species (OB, calculated from taxa coded oa and ob), aquatics (W, w), waterside species (D, d), phytophages (plant-feeders) (P, p), species associated with dead wood (L, l), moorland/heathland taxa (M, m), and decomposers (species associated with decomposing matter of some kind). Decomposers are subdivided into (a) species primarily associated with somewhat dry habitats (RD, rd), (b) those found mostly in rather, to very, foul habitats (RF, rf), and (c) a residuum not easily assignable to one of these (rt). The category 'RT' includes all three of these groups of decomposers (rt + rd + rf). (In each case, the lower-case codes (e.g. 'rd') are those applied to species and the upper-case codes ('RD') are for the ecological group.)

A further ecological component quantified for the present site was the synanthropes, i.e. those species favoured by human activity (Kenward 1997). Taxa have been assigned codes for degree of synanthropy as follows: 'sf'—facultative synanthrope, common in natural as well as artificial habitats; 'st'—typically synanthropic, but able to live in nature; 'ss'—strong synanthrope, absent from or very rare in natural habitats in the relevant geographical area. These codes give rise to ecological groups SF, ST, and SS, which are summed to give SA (all synanthropes). A group of synanthropes regarded as particularly typical of buildings of various kinds has been termed 'house fauna' (Carrott and Kenward 2001; Kenward and Hall 1995).

The quantification of an 'outdoor' component in what are sometimes clearly natural or semi-natural assemblages may not appear entirely logical, but in fact is useful when working with any deposits associated, even if rather indirectly, with human occupation.

The abundance of these 'ecological' groups is discussed against the background of values for many other assemblages from a large number of sites, and typical values for the current site. Thus, for example, % N OB = 30 is a high value, but % N RT = 30 is low; while % N W and % N RF are both high at 10.

The index of diversity offers a guide to the presence or absence of remains of insects which bred in or on the developing deposit (autochthones), low values indicating breeding communities, high ones faunas of mixed origins. Note that 'significantly' low values differ for the various components of assemblages; the more inherently rich a component is, the higher the value of the index of diversity for a living community will be. Thus, 'outdoor' communities associated with natural vegetation tend to give a high value of α, while very specialised communities, such as those of decaying matter deposited by humans, or stored grain, have low or very low ones.

The principal sources for information concerning beetle ecology were Friday (1988), Hansen (1987), Koch (1989-92). For heteropteran bugs Southwood and Leston (1959) and Wagner (1996-7), and for Homoptera the Royal Entomological Society of London *Handbooks*, were used. Other sources are mentioned where appropriate.

Results

A list of taxa noted during the main phase analysis and the assessment is given as Table 1. The individual sample lists for invertebrate remains are given in Appendix 1. It must be emphasised that those for assessment samples ('ReM: A' in the header to the list) are rough lists and not suitable as a basis for more than tentative interpretation. The ecological groups employed, with their abbreviations, are explained in Table 2. Main statistics for the sample assemblages are given in Appendix 2, and, for the purpose of easy comparison as each assemblage is discussed, selected statistics for the combined assemblages from the site ('whole-site statistics') in Table 3.

Throughout this report the subsample code '/T' indicates a subsample processed during the assessment, and '/1' indicates material processed during the main analysis stage.

General comments on the invertebrate assemblages

All the samples which were processed proved to contain at least small numbers of insect and other invertebrate remains. Their chemical preservation ('*erosion*' - 'E'' in the tables and text) is primarily a measure of the biochemical assault to which fossils have been subjected before, during and after burial. It varied both between and within sample assemblages, ranging from very good (showing little decay beyond separation of most of the sclerites of the exoskeletons) to poor (loss of structure and texture, and strong colour change). The amount of *fragmentation* of the fossils also varied in the same way. Preservation is discussed more fully below.

Although there were a few exceptions, remains were generally present at low concentrations by comparison with similar richly organic deposits at many sites. This is probably significant and is considered further in the discussion.

A wide range of invertebrate remains was present, mostly arthropods (Table 1). Insects were much the most abundant, and among these, beetles predominated. The general character of the assemblages was much as at other occupation sites in terms of the range of ecological groups. However, in almost all layers (not just those likely to pre-date occupation) there was a relative paucity of synanthropes (species favoured by artificial habitats, mentioned above and discussed at length by Kenward 1997), and for the site as a whole a restricted range of such species: this is perhaps very significant. Most samples yielded a few bugs (Heteroptera and Homoptera), while fly puparia were generally present and sometimes abundant, and ants and parasitic wasps fairly regularly noted. Fleas - where identifiable the human flea, *Pulex irritans* - were regularly present, although generally in small numbers, and there were a few human lice, *Pediculus humanus*. A few remains of honey bees, *Apis mellifera*, the bee, were found. Fossil bees are quite common in occupation deposits, and sometimes found in great numbers (see the review by Kenward in press). Among the non-insect invertebrates, earthworm (Oligochaeta) egg capsules, spiders (Aranae) and mites (Acari) were frequent, and resting eggs (ephippia) of Cladocera (water fleas) sometimes seen..

Sample-by-sample account

The results are presented in context order in the main part of this *Technical Report* to simplify access and to avoid using an arbitrary 'stratigraphic' order differing from that used in other contributions to post-excavation analysis of the site. Archaeological information, where available at the time of writing, is summarised in square brackets. Notes on the flots, full details of the preservation records and some other information, as well as lists of taxa noted during recording, are given in Appendix 1 but generally also discussed in the text.

The 'numbers of taxa and individuals' (S and N) refer to adult beetles and bugs of the groups used to calculate main statistics, and the preservation record was largely based on insects (though with some reference to other invertebrate groups). Abbreviations for other statistics are explained in the outline of interpretative methods (above) and in Table 2. Numbers of individuals are 'MNIs', i.e. the smallest number of individuals which could have contributed the observed fossils. This was generally calculated simply from numbers of parts, but sometimes note was made of non-matching elytra which could not have come from one individual.

Context 143 Sample 1292c (143/T in assessment report and database) [overlying wattle walls of first phase of building, post-use]

Assessment (1.0 kg): The flot was of modest size, consisting of woody and herbaceous debris, with abundant seeds and insect fragments. Preservation was quite good and fairly consistent (E 2.0-3.5,

mode 2.5 weak; F 2.0-3.0, mode 2.5 weak.). The concentration of invertebrate remains was moderate, with around 40 adult beetles and bugs per kilogramme. These included a ecological mixture of species, many representing at least semi-natural habitats (including water), but with a group of beetles which were most likely to have come from artificial accumulations of decaying matter such as might be found in and around a building. There were three *Aphodius* dung beetles, representing a hint that livestock were present nearby.

Context 165 Sample 1739 (1739c) [external]

Assessment (3.0 kg): The flot was large, consisting of wood fragments and herbaceous detritus. There were rather few beetles, and as preservation was rather good (E: 2.00 F: 2.00, though too few remains for a full record to be made) it appears that input was low, rather than fossils having been lost to the archaeological record by decay. The assemblage showed no special character beyond giving indications of rather foul conditions. It was not considered worthwhile to spend the time needed to sort to recover and record these insects.

Context 165, Sample 1913/1 (1913h) [external]

Detailed analysis: The flot was fairly small, consisting mainly of fine plant remains, but with insect fragments abundant. Some fossils showed very good preservation, but others were significantly more decayed (E1.5-4.0, mode 2.5 weak, possibly bimodal; F 1.0-4.0, mode 2.5 weak). A group of 118 individuals of 66 taxa of adult beetles and bugs of the groups used to calculate main statistics was recorded. Species associated with decomposing material were predominant (% N RT = 67, with many uncoded taxa probably from the same kind of habitat). The most abundant species were *Cercyon analis* (11 individuals), *Lathridius minutus* group (7), *Gyrohypnus fracticornis* (6), a *Cryptophagus* species (5), *Carpelimus bilineatus* (4), and an *Atomaria* species (4). These suggest somewhat foul to rather dry decomposing matter. Species preferring very foul conditions were present in smaller numbers, only *Platystethus arenarius* being represented by two individuals. 'Outdoor' taxa were not present in large numbers (% N OB = 14) and had no obvious single source.

Notable in this assemblage were of the order of 40 *Damalinia* lice, of which some could be identified as *D. ovis*, found on sheep. Their most likely source would be from wool-cleaning. There were also two human lice (*Pediculus humanus*) and a single, tentatively-identified pig louse (*Haematopinus ?apri*).

Groups of this kind are fairly typical of floor deposits in Anglo-Scandinavian York, and the deposit probably contained material from an occupation floor, as sweepings or redeposited sediment.

Context 166 Sample 1502 (1502c) [external]

Assessment (3.0 kg): The flot was rather large, consisting mostly of woody detritus. Preservation of invertebrates was quite good (E: 2.00 F: 2.00). Modest numbers of insect remains were noted, forming an assemblage of no obvious special character. Among the beetles, only the eurytopic decomposer *Cercyon analis* (2) was recorded as represented by more than one individual, though fly puparia were fairly common, suggesting some decomposing matter *in situ*. The assemblage was of low priority and not recorded through time constraints.

Context 185 Sample 1563c (185/T in assessment report and database) [overlying wattle walls of first phase of building, post-use]

Assessment (1.0 kg): The moderately large flot consisted mostly of wood fragments, with numerous seeds and some charcoal. Rather more than 20 adult beetles (no bugs) were observed, with a range of other remains including a human louse, *Pediculus humanus*. Preservation was generally good and

fairly consistent (E: 2.00 F: 2.50). The beetle assemblage was strongly synanthropic, with a range of taxa (some only tentatively identified) typically found together in rather foul, perhaps fairly open-textured, decaying matter with the consistency of stable manure. These species included *Cercyon ?atricapillus*, *Platystethus arenarius*, *Oxytelus sculptus* and *?Anthicus* sp. (probably *A. formicarius* (Goeze) or *floralis* (Linnaeus)). Only small numbers were noted, however, so it is not certain that these species bred *in situ*. There was nothing to parallel the rich 'stable manure' decomposer groups often seen at other sites (e.g. Hall *et al.* 1990; Kenward and Hall 1997). Some other elements of the fauna may have co-existed with these, or have originated elsewhere, and there was a small element from at least semi-natural conditions. A further subsample was processed for detailed analysis (below), but the quantity of sediment was small.

Context 185 Sample 1563/1 [overlying wattle walls of first phase of building, post-use]

Analysis (0.55 kg): The small consisted of plant fibres and bark fragments, with some insects. Preservation was variable (E 1.5-4.0, mode 2.5 weak; F 2.5-5.0, mode 3.0 weak). There were small numbers of various decomposers, but only rather weak hints of the 'foul mouldering' group seen in the assessment sample. Nymphs of homopteran bugs (Auchenorhyncha: 'froghoppers') were rather abundant, their most likely origin being in cut vegetation. If so, some of the 'outdoor' taxa, such as *Olibrus aeneus* and *Apion* species may have been brought with them; this is particularly strongly suggested by the record of an unexpanded *Apion* elytron, since such an individual is most unlikely to have arrived by its own volition.. Alternatively, these may have been the fauna of invading vegetation.

Context 188 Sample 1993c (188/T in assessment report and database) [?change of use, perhaps associated with alteration of primary building]

Assessment only (1.0 kg). The flot was moderately large, consisting of herbaceous debris with some seeds. Invertebrates were present in modest numbers, with a useful quantity of beetles (approaching 50 individuals) and a tentatively-identified honey bee (*Apis mellifera*). Preservation was mostly good (E 1.5-2.5, mode 2.0 weak; F 1.0-3.0, mode 2.5 weak). The beetles were predominantly synanthropic, an assemblage which would not have been out of place in the urban Anglo-Scandinavian deposits at 16-22 Coppergate, York (Kenward and Hall 1995). The habitat suggested is rather moist, somewhat foul, decaying matter, but this might be anything from a rather moist litter-strewn domestic floor to old dumped thatch, or even byre litter.

Context 191 Sample 1632 (1632c) [within building outline]

Assessment only (3.00 kg): A large flot contained substantial numbers of insect remains, including numerous beetles. Preservation was generally fairly good (E 1.5-3.5, mode 2.5 weak; F 1.5-4.0, mode 2.5 weak). Decomposers dominated, with 'many' *Cercyon analis* and 'several' *Ptenidium* sp., *Platystethus arenarius*, *Gyrohypnus fracticornis*, *Cryptophagus* sp. and *Atomaria* sp.; there were also three *Lathridius minutus* group and *Aglenus brunneus*. Most of the other taxa could have co-existed with these in somewhat moist but open-textured decomposing matter. Plant-feeders were present in small numbers and may have been background fauna or imported in cut vegetation. This assemblage was not recorded in detail through shortage of time rather than lack of interpretative potential.

Context 194 Sample 2001c (194/T in assessment report and database) [floor layer in primary building: part of sequence; last *in situ* function-layer]

Assessment only (1.0 kg): The flot, which was fairly small, consisted of wood fragments, abundant charcoal, and a trace of seeds. Preservation of invertebrates was fairly consistent and quite good (E 2.0-3.0, mode 2.5 weak; F 2.0-5.0, mode 2.5, unclear.), but their concentration was very low; there were remains of less than ten beetles. These were of mixed ecological origins.

Context 194 Sample 2001/1 (2001c) [floor layer in primary building: part of sequence; last *in situ* function-layer]

Assessment only (3.0 kg): The flot was fairly small, consisting of herbaceous and woody detritus. A smallish group of insects was noted, with no species particularly abundant. Preservation was generally good (E 1.5-2.5, mode 2.0 weak; F 1.5-3.0, mode 2.0 weak). With the exception of a record of the small stag beetle *Sinodendron cylindricum* (which lives in rotting wood) the fauna was typical of the site, being dominated by a mixture of decomposers and with a limited component of 'outdoor' forms.

Context 218 Sample 1813/1 (1813h) [mixed deposit, above K307, separated from it by K188; external, south of building]

Assessment only (2.5 kg): The flot was moderately large, consisting of woody and herbaceous detritus with many insects. This rich assemblage, mostly well-preserved (E 1.5-4.0, mode 2.0 distinct; F 1.5-3.0, mode 2.0 weak), was only assessment-recorded since others from the context had been analysed in detail. The most abundant species were decomposers, though less common species were fairly mixed ecologically. There were remains of five *Trox scaber*, including a pair of shrivelled (presumably incompletely expanded) elytra. Some remains of the *Apion* weevils were incompletely hardened, again presumably freshly emerged, and perhaps imported in some material, probably cut vegetation, with other 'outdoor' forms. There were tentatively-identified remains of a honey bee (*?Apis mellifera*).

Context 218 Sample 1835/T (1835c: Sample 218/T in assessment report and database) [mixed deposit, above K307, separated from it by K188]

Assessment and analysis (1.0 kg): The flot was quite large and composed of herbaceous and woody debris. Preservation of invertebrates was rather variable; there were appreciable numbers of associated parts, including attached leg and antennal bases, while many remains showed a trend towards colour loss ('pale' in the recording scheme: E 1.0-3.5, mode 2.0 distinct; F 1.0-3.5, mode 2.5 weak; trend to pale 0-2, mode 1 weak). Insect remains were rather abundant, especially fly puparia (of the order of 100). The beetle assemblage included 219 adult individuals; unusually in such a large assemblage, no bugs were found.
A large proportion of the fauna was made up by decomposers (% N RT = 72), though most of them were generalists or not sufficiently closely identifiable for a habitat to be assigned. Species associated with drier decomposing matter were not very abundant (% N RD = 7, well below the value for the site as a whole, Table 3), but those primarily associated with very foul conditions were only a little more common than in the whole-site assemblage (% N RF = 9, compared with 7% for the whole site, Table 3). However, the list of more abundant taxa stands out among those from Viborg for its inclusion of abundant *Carpelimus pusillus*, *Cordalia obscura* (both 15), *Cercyon analis* and *Carpelimus bilineatus* (both 12), *Ptenidium* sp. (7), *Gyrohypnus angustatus* (6), *Acritus nigricornis* (5), and *Platystethus arenarius* and *G. fracticornis* (both 4). Collectively these suggest fairly foul, but perhaps fairly open-textured, decaying matter. Many of the rarer taxa may have exploited similar conditions, as may the two un-named Aleocharinae species present in the higher ranks of abundance.

There were two human fleas, but a distinctive house fauna was lacking, suggesting that the fleas may have been strays or have developed *in situ*. Various 'outdoor' forms were recorded, but all as single individuals and therefore probably either background fauna or accidentally imported with materials of some kind. The record of nine *Pycnoglypta lurida* is notable: this species, very typical of cold tundra-like late-glacial environments in North-West Europe (see discussion), may have been imported in moss, but as it has been found in a number of samples from Viborg, the suspicion arises that it was exploiting artificial conditions on the site.

This assemblage was remarkable for the presence of at least eight adult individuals of the large scarabaeid *Trox scaber*, and - exceptionally - of parts of about 15 larvae. It is argued by Hall and Kenward (2003) that large numbers of *Trox scaber* together with large quantities of bark may be an 'indicator group' (in the sense used by Kenward and Hall 1997) for tanning. At one site at least, the *T. scaber* were more decayed than other components of the insect fauna, and this was supposed to have come about when the beetles were passed through tanning agents with skins (Hall *et al.* 2000). In the present case, the adult *Trox* may have been more decayed than the rest of the fauna, being somewhat pale and sometimes cracked, but this was not certain; individual *Trox* fossils ranged from fresh to well-decayed. The abundant fly puparia might give a clue as to the presence of skins or perhaps of materials likely to have been used in tanning. The presence of the remains in the main area of the site might argue against tanning, a foul process not likely to be tolerated near houses.

Allan Hall has kindly inspected the residue from this subsample and offers the following comments:

> Brief inspection of the residue of Sample 218 showed that the bulk of it consisted of very decayed bark with a little wood attached some cases, together with some mosses which would be typically found growing on bark, tree leaf fragments and some buds (including those of oak, *Quercus*), and modest numbers of seeds of annual nitrophile weeds. There were also fragments of rather decayed leather, some, at least, apparently offcuts. In the finest fraction were small numbers of bark 'sclereids' (amorphous masses of lignified cells from within the bark of some trees). There is thus some possibility that this deposit contained waste from tanning with bark, perhaps mixed with waste from the next stage of leather working (working tanned leather into artefacts), and colonised by nitrophile weeds after being dumped. Clearly a more detailed analysis is required to shed more light on this interpretation.

The fossils of *T. scaber* from Viborg, and of *Phymatodes testaceus* (present in this and several other samples from the site, and recorded from stored tan-bark) are discussed below.

Context 218 Sample 1835/1 (1835h) [mixed deposit, above K307, separated from it by K188]

Assessment only (1.0 kg): This assemblages was assessed in the main phase of analysis but not regarded as of high priority to record in detail in view of other lists from the context. Nearly 70 individuals of 37 taxa of adult beetles and bugs were noted during assessment of the modest-sized flot (both totals would undoubtedly increase on full analysis). Preservation was variable but often fairly good (E 2.0-4.0, mode 2.5 distinct; F 1.5-3.0, mode 2.0 weak). The fauna was by no means identical to that from the other samples from the context, but this is not surprising as experience at other sites, especially 16-22 Coppergate, York (Kenward and Hall 1995) has shown that deposits and their fauna may vary appreciably over a few centimetres. The ecological nature of the fauna was similar, however: *Cercyon analis*, a generalist decomposer, was much the most abundant beetle ('many'), and other species suggested a range of kinds of decomposing matter.

Context 218 Sample 1881/1 (1881w) [mixed deposit, above K307, separated from it by K188]

Analysis (2.6 kg): The flot was large, consisting of wood chips, bark fragments, 'straw', moss, seeds and leaf fragments. Insects were abundant, with numerous beetles, fly puparia, beetle larvae, mites and spiders. Some remains showed very good preservation, including surviving intersegmental membranes, and there were whole *Trox* and *Hydrobius* sclerites. Some other fossils were very fragmented, however, perhaps especially amongst the outdoor forms. There were several distinctive (but unfortunately unidentified) beetle larvae.

The most abundant species was *Cercyon analis* (26 individuals), with *Lathridius minutus* group in the second rank (18). *Pycnoglypta lurida* was represented by ten individuals; it is discussed below. Foul conditions at the site of deposit formation or nearby are suggested by six *Platystethus arenarius*, in

contrast to the rather drier habitats typical of *L. minutus* group. This mixture of habitats is reflected throughout the list. It is possible that the deposit included a component from within a building (e.g. *L. minutus* group, *Cryptophagus* and *Atomaria* sp, (6 each), *Xylodromus ?concinnus* (3), and various rarer taxa including a human flea), but all of these may have exploited drier patches of litter in a heterogeneous deposit.

There were several pale unexpanded *Apion* ('clover weevil') elytra, presumably from individuals in situ or imported with cut vegetation or some other raw material. Various other insects, including *Gymnetron labile*, apparently typical of 'hay' in deposits in York (Hall *et al.* 1990; Kenward and Hall 1997) may have arrived by the same route. Other remains (perhaps including *P. lurida*) may have been brought in moss or turf.

This appears to have been a rather mixed deposit, in accordance with the excavator's description.

Context 253 Sample 1989c (253/T in assessment report and database) [floor activity layer in extension to building, above K295/257]

Assessment (1.0 kg): The flot was fairly small and of mixed composition, with abundant seeds. There were not many invertebrates, and only around 30 beetles and bugs. Preservation was fairly good, although there was a trend to paleness. The more abundant beetles were very typical of fairly dry house floors, as were some of the rarer taxa.

Context 253 Sample 1989/1 (1989c) [floor activity layer in extension to building, above K295/257]

Analysis (3.0 kg): Invertebrate remains were fairly abundant, including 129 adult individuals of 64 beetle and bug taxa, numerous nymphs of Auchenorhyncha (froghoppers etc), fly larvae and mites, and various other remains in smaller amounts. Preservation was very variable, often poor, and remains were fragile (E 2.0-4.0, mode 4.0 weak; F 1.5-5.0, mode 3.5 weak; trend to yellow-orange 0-4, mode 3). The degree of fragmentation and decay limited identification in many cases. Only the *Lesteva longoelytrata* was dark and fresh, the rest of fossils being reddened.

The beetle and bug assemblage was of rather low diversity (compared with others from this site: alpha = 50, SE = 8), and this together with the presence in the upper ranks of abundance of a fairly coherent ecological group of species likely to occur together in fairly dry decomposing matter suggests a community *in situ*. The more abundant species included *Lathridius minutus* group (19), *Atomaria* sp. (11), *Cryptophagus* sp. and a *Corticaria* species (both 7), Cercyon analis (6), *Xylodromus concinnus* (5), *Cordalia obscura* (4) and *Cryptophagus ?scutellatus* (3). All of these would have been at home in litter on the floor of a reasonably dry building, or in various materials kept indoors, and many of the rarer taxa would have been able to exploit indoor habitats. The nymphs mentioned above, and some weevils and leaf beetles, may have been imported in cut vegetation, perhaps strewn onto the floor - where it would provide habitat for the 'litter' community.

Context 257 Sample 1994c (257/T in assessment report and database) [floor layer in extension to building, above K306]

Assessment (1.0 kg): The flot, which was of modest size, contained numerous fly puparia, and small numbers of other remains, including only about 25 adult beetles (no bugs). Preservation varied a little, and was generally fairly good (E 1.5-3.0, mode 2.5 distinct; F 1.5-3.0, mode 2.5 distinct; slight yellowing - trend to yellow 1). The beetles were an ecologically diverse group. Most of the taxa would not have been out of place in a floor with a little strewn plant material which was not too damp; the large ground beetle *Pterostichus melanarius* is a typical stray in buildings, frequent at many

archaeological sites, and the other outdoor forms may have been 'background fauna' (sensu Kenward 1978), or have been imported with various kinds of materials.

Context 257 Sample 1994/1 (1994c) [floor layer in extension to building, above K306]

Analysis (3.0 kg): The flot, of moderate size, yielded quite large numbers of tiny fragments of beetle cuticle, primarily of outdoor forms but also of some synanthropes; even small sclerites were often broken. Chemical erosion was variable (E 2.0-4.0, mode 3.0 weak; F 2.0-5.0, mode 3.0 weak; trend to pale 1-2, mode 1). The concentration of remains was more than twice that in the other samples from this context: the minimum number of individuals for adult beetles and bugs was estimated at 157, with 73 taxa recorded. Diversity was quite low (alpha = 53, SE = 7). This was reflected in the presence of quite large numbers of some species: there were 18 *Lathridius minutus* group and 17 *Cercyon analis*, and also *Cryptophagus* sp. (8), *Atomaria* sp. (7), *Ptenidium* sp. (6), *Ephistemus globulus* and *Corticaria* sp. (5 each). There were also six human fleas, probably breeding in floor litter, since a distorted head, perhaps unexpanded, was recorded. Together with the less abundant decomposers these suggest reasonably dry litter, perhaps damper locally. 'Dry' decomposers made up almost a third of the assemblage. Conditions were probably never too foul, since fly puparia were uncommon and foul decomposers rare (% N RF = 2).

Context 257 Sample 1994/1 (1994h/II) [floor layer in extension to building, above K306]

Analysis (1.0 kg): The flot was very small, and yielded only a few insects, including 19 individuals of 17 taxa of adult beetles and bugs; the concentration of remains was even lower than in the assessment sample. Preservation was generally fairly good, so input into the forming deposit was probably low (E 2.0-3.5, mode 2.5 weak; F 1.5-3.0, mode 2.0 weak). Subjectively, rather moist conditions were indicated.

Context 270 Sample 2018/1 (2018c) [within building outline, south end]

Analysis (3.0 kg): The flot was of moderate size, consisting mostly of woody debris. Invertebrates, mostly insects, were abundant, but many remains were fragmented and beyond identification. Chemical preservation was fairly good (E 1.5-3.5, mode 2.5 distinct; F 1.0-5.0, mode 2.5 weak). In total, 170 adult individuals of 88 beetle and bug taxa were recorded, though other species were probably represented by the numerous unidentifiable chips of cuticle. The fairly high diversity and moderately large proportion of outdoor forms suggest mixed origins, perhaps the presence of background fauna (alpha = 73, SE = 10; % N OB = 25). However, some decomposers were abundant, and probably lived where the deposit formed, unless imported in litter or sediment. The most numerous were *Cercyon analis* (16), *Lathridius minutus* group (11), *Corticaria* sp. B (10), *Atomaria* sp. (8), *Orthoperus* sp. (6), *Platystethus arenarius* and an Aleocharinae species (both 5) and *Cryptophagus* sp. (4). These and the rarer decomposers suggest a range of compost-like matter, probably mostly fairly dry, with fouler patches indicated by quite large numbers of fly puparia and species such as *Platystethus arenarius*. The outdoor forms may all have been background fauna, though the presence of some pale remains of *Apion* weevils suggests importation of cut vegetation.

Context 274 Sample 2016/1 (2016f/I) [within building outline, south end]

Analysis (3.0 kg): The flot was quite small, with charcoal, woody detritus, seeds and quite a lot of invertebrate fragments. The insect remains were much fragmented, and some minute fragments could not be listed. There were some well-decayed fossils, and a trend to colour loss (i.e. to pale) was noted in *Ptinus* and some *Lathridius* and *Cryptophagus* (E 1.5-4.0, mode 3.0 weak; F 1.5-4.0, mode 2.5 weak). Adult beetles were quite abundant, and there were a few bugs (N = 123, SD = 66). Diversity was fairly low (alpha = 58, SE = 9), though only two species were particularly common. The most abundant species was *Apion cerdo*, a weevil attached to vetches (especially *Vicia cracca*, where it

lives in the pods, Morris 1990), of which there were 15. Most of the elytra of this species were soft, so it is unlikely that the insects arrived through their own activity. Related to these ecologically were three *Gymnetron ?antirrhini*, another weevil, found mainly on *Linaria* species (Hoffmann 1958), another *Apion*, *Sitona ?suturalis*, *Hypera* sp. (all two; one *Hypera* elytron was soft), and a third *Apion* and *Sitona lepidus* (one of each). Some other elements may have originated with these, including three 'froghopper' nymphs, and much the most likely route to the site is in cut hay-like vegetation. These species account for the very high proportion of outdoor forms and plant-associated species (% N OB = 38; % N P = 25).

The other main ecological grouping in this assemblage was a range of taxa likely to have lived in fairly dry, perhaps locally wetter, litter - perhaps the 'hay' implied above. *Lathridius minutus* group (12), *Ptenidium* sp. (6), *Corticaria* sp. (5), *Cryptophagus* sp.. (4) and various rarer taxa constitute this group, giving 16% RD individuals, with appreciable numbers of RF individuals (8%). These species probably lived in a structure, whence also came three spider beetles, *Ptinus raptor*.

This sample provided a fragment from the thorax of the small stag-beetle *Sinodendron cylindricum*.

Context 274 Sample 2017/1 (2017/I) [within building outline, south end]

Analysis (3.0 kg): The flot was small, and included some 'bark rolls'. The concentration of insect remains was substantially lower than in Sample 2016, and only 39 adult individuals of 34 beetle and bug taxa were found. Preservation varied substantially (E 1.5-4.0, mode 3.0 weak; F 1.5-5.0, mode 3.0 weak). Subjectively this assemblage resembled that from Sample 2016, but objectively it had no clear character beyond a rather high proportion of outdoor forms.

Context 295 Sample 2172c (295/T in assessment report and database) [floor layer in extension to building, above K306]

Assessment only (1.0 kg): The flot was minute, and yielded only small numbers of invertebrates (less than 10 beetles), which were quite well preserved (suggesting low input rather than post-depositional loss by decay). Such remains as were present were a random subsample of the taxa seen elsewhere at this site.

Context 301 Sample 2385a (301/T in assessment report and database) [human faeces from privy adjacent to primary building]

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Assessment (1.0 kg): This subsample gave a very large flot, mostly herbaceous debris. Invertebrate remains were abundant, with fly puparia predominant. Preservation was a little variable, often very good (E 1.5-3.5, mode 2.5 weak; F 1.5-3.5, mode 2.5 weak). Around 30 beetles (and a single bug) were represented by the recorded remains, but the assemblage was of rather mixed nature. There were components indicative of foul matter, some likely to have lived in fairly dry litter, and some which may have arrived in moss (though other routes are entirely possible). This kind of mixture has been encountered in cess pits at other sites (e.g. 16-22 Coppergate, York, UK, Kenward and Hall 1995). Aquatics may have come in water rather than invading *in situ*, and abundant remains seem to have been imported in moss, presumed to have been used as anal wipes. A tentatively-identified honey bee (*?Apis mellifera*) represented another component also found in cesspits in York, perhaps arriving in faeces, having been swallowed as a contaminant in food or drink. The complete lack of insect parasites of humans is a little surprising, though some were found in the larger subsample from Sample 2385c.

Context 301 Sample 2385/1 (2385c) [human faeces from privy adjacent to primary building]

Analysis (2.0 kg): The flot was of moderate size, consisting of bran and woody and herbaceous detritus, with many puparia. Insects were abundant, with many fly puparia and 148 adult individuals of 80 beetle and bug taxa. There were quite a lot of tiny fragments, especially of Carabidae (ground beetles) and ?Chrysomelidae (leaf beetles), which could not be identified. Some fossils were well-decayed, including a proportion of the bee parts (E 2.0-4.5, mode 2.5 weak; F 2.0-5.0, mode 2.5 weak). Decomposers dominated: % N RT = 63, with 22 % RD individuals but also 6% RF forms. The more abundant taxa were *Lathridius minutus* group (14), *Cercyon analis* (9), *Ephistemus globulus* and *Orthoperus* sp. (both 6), *Cryptophagus* sp. (5), and *Carpelimus bilineatus* and *Gyrohypnus fracticornis* (both 4). There were also three *Acritus nigricornis*, *Xylodromus concinnus*, *Ptinus raptor* and *Atomaria* sp.. These species, and many of the less abundant ones (e.g *Crataraea suturalis*), form a community likely to have lived in floor litter, which was presumably cleared away and dumped into the pit. Whether this floor was in a house, workshop or byre is not certain. Diversity of this assemblage was quite high (alpha = 71, SE = 10), so it probably has rather mixed origins. Thus the presence of human fleas (2) and lice (1), and of a *?Melophagus ovinus* (sheep ked) puparium and *Damalinia* lice (typical of house floors at many English sites, e.g Carrott and Kenward 2001; Kenward and Hall 1995) cannot be taken as proof of a domestic origin for the decomposers, though there was no 'stable manure' community either (cf. Hall *et al.* 1990; Kenward and Hall 1997). There were, however, a few weevils considered typical of hay, including a soft *Apion* elytron suggestive of importation. The lack of a rich foul decomposer community (only an *Aphodius* species in this category being represented by more than one individual) is rather striking, suggesting that foul matter was not exposed for long (or if so, then in winter).

Two honey bees, *Apis mellifera*, may represent accidental deaths, though the fact that some of their parts were well-decayed my indicate a more complex route, perhaps via honeycomb eaten whole, or honey used in sweetening.

Context 303 Sample 2362/1 (2362c) [LHS of site, area of southern pit]

Analysis (3.0 kg): The flot was fairly large, made up of herbaceous debris including bran, and puparia. Some fossils showed very good preservation, with mouthparts and limb bases still in position as well as numerous hairs and scales; some fossils retained full life colours. There were, however, some very fragmented remains, imposing limits on identification (E 1.0-3.5, mode 2.0 weak; F 1.0-4.5, mode 2.5 weak to distinct). Insects were abundant, with over 100 fly puparia, numerous adult flies, and 176 adult individuals of 85 beetle and bug taxa. Species associated with decaying matter of various kinds made up a large part of the assemblage, coded decomposers accounting for almost two thirds (% N RT = 63). 'Dry' decomposers were rather abundant (% N RD = 28). Much the most abundant was *Lathridius minutus* group (19 individuals), followed by *Cercyon analis* and an *Atomaria* species (both 7), *Ptinus raptor*, and *Cryptophagus* and *Orthoperus* sp. (all 5). These may have lived in floor litter, or a range of other materials; *P. raptor* is perhaps more likely to have lived indoors than out, and the same might be argued for two human fleas. Fouler conditions are suggested by the abundant fly puparia, and a few beetles (e.g. *Cercyon terminatus (4), and C. unipunctatus* and *Platystethus arenarius*, both with two individuals). Outdoor forms were quite abundant (% N OB = 22). Some were probably imported in moss or water (three each of *Hebrus* sp. and *Chaetarthria seminulum* and single individuals of several species including a pond-skater, *Gerris* sp.). Various others may have been background fauna, though subjectively an origin in cut vegetation (or again, moss) seems quite possible.

There were two honeybees (*Apis mellifera*).

Context 304 Sample 2406c (304/T in assessment report and database) [human faeces from privy adjacent to primary building]

Assessment (1.0 kg): This subsample yielded a flot of modest size, consisting of fine herbaceous debris - apparently bran - and trace of moss and containing fairly small numbers of adult beetles (and a bug: around 30 individuals), all as single individuals, and a limited range of other invertebrates. The preservational condition of these remains varied, and some fossils were very degraded or fragmented (E 2.0-4.0, mode 3.0 weak; F 1.5-4.0, mode 2.5 weak.; trend to pale, slightly orange-brown 0-3, mode 1, weak). The tendency to loss of colour, and towards orange-brown shades, suggested post-depositional change, perhaps recent decay (as was seen at the 44-45 Parliament Street site, York, England, Davis *et al.* 2002, and discussed by Kenward and Hall 2000 and in press). The beetles and bugs represented a range of habitat types, similar to that seen in the assemblage from Context 303, and similar routes to the deposit may be hypothesised.

Context 304 Sample 2406/1 (2406mg/II) [human faeces from privy adjacent to primary building]

Analysis (3.0 kg): The flot was large, consisting mainly of wood chips and bran. Insects were abundant, with 157 individuals of 103 taxa of adult beetles and bugs. Preservation varied, and was sometimes good, though some identifications were limited by fragmentation (E 1.5-3.5, mode 2.0 weak; F 2.0-5.0, mode 2.5, distinct; trend to pale 0-3, mode 0 strong). Even though a few species were fairly common, mathematical diversity was high (alpha = 130, though SE = 20). This was mirrored in ecological diversity, with (ecologically varied) components typical of occupation sites but also elements from water, heath or moor habitats, waterside vegetation, moss, open ground and trees (both living and dead wood). It is possible that these insects represent background fauna, but it is more likely that many or all were imported with some resource or resources, moss, cut waterside vegetation or peat being possibilities. The component indicative of acid terrain was quite clear: *Dyschirius globosus* (4) and *Trapezonotus* sp., *Ulopa ?reticulata* and *Eauaesthetus bipunctatus* (all single specimens) clearly falling in this group, but several other taxa quite possibly arriving with it. There was a single honeybee, possibly introduced in faeces, though perhaps a victim of accidental drowning.

Context 304 Sample 2406/1 (2406c) [human faeces from privy adjacent to primary building]

Analysis (1.35 kg): The small flot consisted primarily of cereal bran. Modest quantities of insect remains were present, most being somewhat reddened. Identifications were often limited by fragmentation (E 1.4-4.0, mode 2.5 weak; F 1.5-4.5, mode 2.5 weak; trend to orange-red 0-3, mode 2 weak). There were 79 individuals of 59 taxa of adult beetles and bugs. The outdoor component was quite large, and aquatics rather numerous (in relation to the total assemblage: % N OB = 30, % N W = 10). These remains may have been background fauna, having dispersed from nearby habitats, including the lake margins, and died in the pit, but importation in some resource seems more likely. Moss seems a very probable source of these remains, though importation in water, or in waterside litter (e.g cut 'reeds') which had lain on the ground for a while cannot be ruled out. *Chaetarthria seminulum* (3), *Coelostoma orbiculare* (2), and the saldid, *Hebrus* sp., *Elaphrus cupreus*, *Trechus ?rivularis*, *Hydraena* sp. and *Cyphon* sp. (all single individuals) are quite likely to have been gathered up dead or alive in waterside moss. Moss is favoured over water by the lack of aquatics such as water fleas. too. Some other species may have come with moss from drier places: the byrrhid and two *Rhynchaenus ?quercus* from beneath a tree canopy, for example, and *Cerylon ferrugineum* may have originated in a similar way. Both water and moss are resources likely to find their final resting place in a cess pit, of course. Moss seems certainly to have been used for anal wipes at Coppergate, York (Kenward and Hall 1995), and invertebrates collected with water may have passed through human digestive tracts before reaching the pit, Osborne (1981, 269; 1983) having established that insect remains pass through the human gut 'and emerge in perfectly identifiable condition'.

Some components of the fauna probably originated from the settlement. *Carpelimus bilineatus* (6) is normally a waterside species today, and so may have been brought in moss or water, but in the past it was often very abundant on occupation sites, even in floors (Kenward and Allison 1994; Hall and Kenward 1995). Of the other synanthropic species, only *Lathridius minutus* group (5) was represented by more than two individuals. Fly puparia were rare, too. It thus appears that a breeding community of insects did not develop *in situ*, suggesting rapid burial or deposition in winter. There was a single human flea.

Context 305 Sample 2404/1 (2404c) [LHS of site, area of north pit]

Analysis (3.0 kg): The flot was large, containing bran, herbaceous debris, and fern and ?straw fragments. Some of the fossils showed superb preservation, with attached mouthparts and many hairs and setae (e.g. on a saldid wing). However, some were very fragmented, limiting identification (E 1.0-3.0, mode 1.5 weak; F 1.0-5.0, mode 2.5 weak). Insects were fairly abundant, including 115 individuals of 59 beetle and bug taxa. Few species were at all numerous, but there were 22 *Lathridius minutus*, which therefore seems to have lived *in situ* or been imported in litter of some kind, perhaps floor debris. *Cercyon analis* and *Cryptophagus* sp. (6 each), *Ptenidium* sp. and *Ephistemus globulus* (4 each), and various of the rarer taxa may have had a similar origin. This is supported by the presence of two human fleas and two human lice. Some of the plant-feeders are candidates for importation in cut hay-like plant material (e.g. the various *Apion* species, *Hypera* sp. and *Gymnetron labile*). *Bruchus rufimanus* (1) may have arrived in various ways, but at some other sites (including 16-22 Coppergate, York, Kenward and Hall 1995) seems to have been accidentally eaten with peas or beans and subsequently voided with the faeces; the tentatively identified remains of a honeybee may have arrived in the same way.

This sample yielded remains of three individuals of the longhorn beetle *Phymatodes testaceus*, whose repeated occurrence in the site is discussed below.

Context 306 Sample 2357c (306/T in assessment report and database) [external deposit pre-dating northward extension of primary building, above K309 and K392]

Assessment (1.0 kg): A fairly small flot, consisting mainly of woody and herbaceous plant debris (with some seeds), contained useful numbers of invertebrate remains, whose preservational condition varied from good (sometimes with associated sclerites and delicate hairs still attached) to distinctly poor (E 1.0-4.0, mode 2.5 weak; F 1.0-4.0, mode 2.5 weak). The beetles, of which there were about 50, formed a group which might be found in any intensive occupation site of the period, with a bias towards somewhat foul conditions. There was a hint from some of the plant feeders, and especially from the presence of a newly-emerged clover weevil, *Apion* sp., that cut, hay-like, vegetation had become incorporated in the deposit. A single *?Apis mellifera* (?honey bee) was noted.

Context 307 Sample 2261c (307/T in assessment report and database) [mixed deposit, directly above natural peat, to south of primary building]

Assessment (1.0 kg): This subsample gave a large flot, difficult to sort, primarily wood fragments, but with appreciable quantities of herbaceous debris and some seeds. Preservation of the invertebrates, which were present in quite large numbers, was generally fairly (sometimes very) good, though most showed some tendency towards yellow colouration, and a small proportion had decayed quite strongly towards yellow (E 1.0-3.5, modes 1.5 and 3.0 distinct; F 1.0-3.5, modes 1.5 and 2.5 distinct; trend to yellow 0-3, modes 1 and 3 distinct - only a small proportion at 3). The remains therefore may have had two separate origins, though apparently cutting across ecological groups. Some remains were very fresh-looking, but undoubtedly ancient. Around 45 adult beetles (and a single bug) were recorded. The assemblage (both the beetles and rather numerous fly puparia) was predominantly a synanthropic group indicative of rather foul to very foul decaying matter, with a trace of aquatic and waterside taxa.

Context 309 Sample 2251c (309/T in assessment report and database) [external deposit pre-dating northward extension of primary building]

Assessment (1.0 kg): The flot, which was rather large, consisted of fairly coarse herbaceous debris with some charcoal, and quite large numbers of invertebrates, among them about 45 adult beetles and bugs. These remains varied substantially in their preservational quality, though most were in good condition (E 1.5-4.0, mode 2.0 weak; F 1.0-4.0, mode 2.5 weak). The fauna appeared to have had mixed origins, with components from water, herbaceous vegetation, and artificial decomposer habitats. Among the last, fairly foul conditions seem to have obtained at least locally. The several dung beetles (*Aphodius* and *Geotrupes*) present may have come from the same habitat as the other foul decomposers, but may indicate nearby penned livestock or local grazing land. This group echos many others from the site.

Context 338 Sample 2501/1 (2501c) [within outline of main building]

Analysis (3.0 kg): The flot was small, being mainly woody plant detritus. Preservation varied, with some rather well-decayed fossils (E 2.0-4.0, mode 2.5 weak; F 2.0-4.5, mode 4.0 weak; trend to yellow-orange 0-3, no obvious mode). Insects were not very abundant, and only 47 adult individuals of 39 beetle and bug taxa were recorded. The more abundant species, and some of the rarer ones, probably came from fairly dry litter within a structure, but much of the fauna may have arrived by random routes as background fauna or in raw materials or waste. Importation of material from heathland is hinted at by the record of the weevil *Micrelus ericae*. Importation of another kind of material - cut hay-like vegetation - may be indicated by a pale, crumpled elytron of an *Apion* species.

Context 342 Sample 2527c (342/T in assessment report and database) [floor layer in primary building: part of sequence]

Assessment (1.0 kg): The flot was very small, with very few invertebrate remains (less than ten beetles). Preservation was fairly good (E 1.0-2.5, mode 2.0 weak; F 1.5-3.0, mode 2.0 weak; though hard to estimate).

Context 342 Sample 2528/1 (2528h) [within outline of main building, south end]

Analysis (1.0 kg): A very small flot was recovered, containing few invertebrates. There were only six beetles, too few for a full preservation record to be made (E 2.5-4.0; F 1.5-5.0). An origin in heathland turf or vegetation is possible, but this cannot be more than a subjective impression.

Like other floor layers at the site, Context 342 seems to have received little organic waste material, or to have been regularly cleaned.

Context 349 Sample 2530c (349/T in assessment report and database) [floor layer in primary building: part of sequence]

Assessment (1.0 kg): The trace flot contained very few arthropod remains other than modest numbers of mites. Parts of only six beetles and bugs were noted.. Preservation varied (there were too few remains for a useful preservation record to be made), but significant numbers of fossils had probably *not* been lost by decay (i.e. *input* was low). No interpretation may be ventured.

Context 349 Sample 2552/1 (2552h) [floor layer in primary building: part of sequence]

Analysis (3.0 kg): The flot was very small, and contained modest quantities of mites and a few fragments of beetles and bugs (N = S = 9).Preservation was fairly good (F 2.0-3.5, no clear mode). As

for Sample 2530c, there were too few remains for interpretation, but net input of insects appears to have been low, suggesting lack of organic matter on the floor.

Context 349 Sample 2593/1 (2593h) [floor layer in primary building: part of sequence]

Analysis (2.7 kg): The flot was minute and contained very few invertebrates, including single individuals of seven beetle taxa. Preservation varied (E 2.0-555, F 1.0-555, no obvious modes), but there were some very decayed beetle scraps, beyond identification (and some of those listed were just rotted scraps), so perhaps most fossils had completely decayed. No interpretation can be offered in view of this.

These three very small groups from Context 349 suggest low input of organic matter on to the floor surface, and therefore (biologically) fairly clean conditions.

Context 365 Sample 2596c (365/T in assessment report and database) [floor layer in primary building: part of sequence]

Assessment (1.0 kg): The flot was very small, with woody fragments, a few seeds, and less than ten adult beetles of no clear ecological nature. The remains were fairly well preserved, but it was impractical to record preservation using the scales. Net input of insects therefore seems to have been low.

Context 365 Sample 2596/1 (2596h) [floor layer in primary building: part of sequence]

Analysis (1.6 kg): The small flot consisted primarily of woody plant fragments. It was not possible to record preservation fully (E 2.0; F 2.0; *Daphnia* well-decayed). The invertebrates were ecologically mixed, probably having random origins. The *Daphnia* resting egg perhaps hints at the use of water.

The floor layers identified as Context 365 indicate a lack of habitat for insects, so that the structure was probably kept clean by the standards of the times (compare with the seething fauna of the near-contemporaneous floors in York, e.g. Kenward and Hall 1995; Hall and Kenward 2000), or the rather earlier ones at the small rural site of Deer Park Farms, Northern Ireland (Allison *et al.* 1999a-b; Kenward and Allison 1994b).

Context 392 Sample 2684c (392/T in assessment report and database) [external deposit pre-dating northward extension of primary building]

Assessment (1.0 kg). The flot was quite large, and composed of varied plant debris. Preservation was fairly consistent, and moderately good (E 2.0-3.5, mode 2.5 weak; F 1.5-3.0, mode 2.5 weak.). The beetle assemblage (of about 50 individuals) was dominated by a group of species rather typical of some deposits at intensive-occupation sites (including many deposits at the present one), and included a component regarded as indicative of moderately foul conditions. There were traces of species associated with herbaceous plants.

Context 395 Sample 2696c (395/T in assessment report and database) [floor layer in primary building: part of sequence]

Assessment (1.0 kg): The flot, which was rather large, contained moderate numbers of invertebrate remains, including parts of around 30 adult beetles and bugs. Preservation was fairly good (E: 2.00 F: 2.00 E 2.0-3.0, mode 2.0 weak; F 2.0-3.0, mode 2.0 weak). The insects were somewhat mixed ecologically, but typical of the present site, with 'house fauna' components, and others from outdoor habitats present in appreciable numbers (perhaps imported with some resource).

Context 400 Sample 2755 (2755c) [centre of site, left side of division]

Assessment (3.0 kg): Preservation was quite good on the whole (E: 2.0 F: 2.0). There were not large numbers of insects (30 individuals of 27 taxa of adult beetles and bugs were noted, though this is likely to be an underestimate), but the assemblage was clearly dominated by outdoor forms, which contributed over two thirds of the individuals. These included a disproportionate number of aquatics: three *Chaetarthria seminulum*, two *Hebrus* sp., and single individuals of *Coelostoma orbiculare* and *Hydraena* sp. There were also several waterside taxa, and species found in natural litter and moss. Importation in water, or (in view of the lack of aquatics such as water fleas) more probably in waterside moss, seems likely. A single human flea was noted.

Context 406 Sample 2819c (406/T in assessment and database) [floor layer in primary building: part of sequence]

Assessment (1.0 kg): The flot was of modest size and contained quite a lot of charcoal, but the concentration of remains was low; preservation was rather good (E 1.5-2.5, mode 2 weak; F 1.5-3.5, mode 2.5 weak). Parts of less than 20 adult beetles were noted, and no bugs; the beetles were typical of (though not exclusive to) house floor assemblages. Net input of insects seems to have been low, suggesting clean conditions.

Context 406 Sample 2819/1 (2819c) [floor layer in primary building: part of sequence]

Analysis (2.8 kg): The flot was fairly small, consisting of woody and herbaceous detritus. Preservation was quite good (E 2.0-3.0, mode 2.5 weak; F 1.5-3.5, mode 2.5 weak), but the concentration of remains low: only 54 individuals of 35 adult beetle taxa were present (no bugs). There appeared to be a mixture of a small synanthropic component typical of fairly dry litter, and a few outdoor forms of uncertain origin. A hint that cut vegetation may have been incorporated came from unexpanded, pale or soft remains of both *Apion* species and *?Sitona* sp., and from a 'froghopper' nymph.

Context 425 Sample 2988c (425/T in assessment report and database) [surface of natural peat preceding first building phase, outside the area of the building]

Assessment (1.0 kg): The flot was rather large, consisting mostly of what appeared to be rootlets, with some moss and undisaggregated humic sediment (possibly indurated by pre-burial dehydration?). Preservation was very varied (E 1.0-5.0, mode 3.0 weak; F 1.0-5.0, mode 2.5, weak; associated sclerites were present in some cases), but with no sign of bimodality (i.e. no evidence of separate origins). There were numerous decayed scraps of cuticle and some remains had probably decayed beyond recognition. Remains of nearly 40 adult beetles (and no bugs) were noted, representing marshy conditions with dryer land, perhaps rough grassland, beyond. *Chaetarthria seminulum*, much the most abundant species, typically lives in mud and litter by water. It, and much of the remaining fauna, probably lived *in situ* in an area of short vegetation, rather wet locally. There were hints of foul matter from a few species (notably *Cryptopleurum minutum* and *Oxytelus sculptus*), but nothing to suggest grazing.

Context 426 Sample 3008/1 (3008h) [N of main structure]

Analysis (3.0 kg): The moderately large flot consisted of fibrous plant debris and numerous insects, especially puparia (of which there were more than 100). Some remains, mainly outdoor forms, were very fragmented, limiting identifications. Chemical preservation was often quite good (E 1.5-3.5, mode 3.0 weak; F 2.0-5.5., mode 2.5 weak). The assemblage of adult beetles and bugs was species-rich (65 taxa among 91 individuals; alpha = 101, though SE = 22). Only a few species were at all

common: *Lathridius minutus* group (7 individuals); *Cercyon analis* (5), *Oxytelus sculptus* (4) and *Carpelimus bilineatus* (3). These, and most of the rarer decomposer, could have co-existed in litter which ranged from dryish to moist: the fly puparia suggest at least restricted patches of foul habitat. There were three human fleas. The outdoor species may all have been background fauna, but an indication of the introduction of cut vegetation came from two *Apion* species (one elytral fragment being apparently newly-emerged), *Gymnetron labile*, two psyllid nymphs, and three 'froghopper' nymphs. This assemblage gave a very weak hint of material resembling stable manure (see discussion).

Context 453 Sample 3029c (453/T in assessment and database) [floor layer in primary building: interleaved in the above sequence, ?faeces of livestock]

Assessment (1.0 kg). A 'squash' for parasite eggs and other microfossils was carried out on a small subsample, but revealed no eggs. The flot from paraffin floatation was small, consisting mainly of ?rootlets and other plant tissue. Rather few insects were present, and a few mites. Preservation was good, sometimes excellent (E 1.5-2.5, mode 2.0 weak; F 1.5-3.0, mode 2.5 weak). A little over 20 beetles were recorded, a rather mixed group with synanthropic and natural or semi-natural components, and no clear dominant ecological group. There was no indication of foul matter, though the four water flea resting eggs indicated water, probably imported or arriving via faeces.

Context 480 Sample 3185c (480/T in assessment report and database) [floor layer in primary building: part of sequence]

Assessment (1.0 kg): The flot (which was of modest size) consisted mostly of charcoal, and contained rather few invertebrates. There were a parts of little more than ten beetles, whose preservation was generally good, sometimes excellent, but subjectively unusual on the basis of colouration. Many remains showed a strong trend to yellow colours, and scraps of cuticle were present, suggesting the possibility that there had been loss of other remains through decay (E 1.5-2.5,mode 2.5 distinct; F 2.0-3.5, mode 2.5 weak. Yellow-brown 1-3, mode 3 strong). This was supported to some extent by the presence of earthworm egg capsules, suggesting the sediment was suitable for worms to burrow. House fauna predominated, with a component of outdoor forms.

Context 480 Sample 3184/1 (3184h) [floor layer in primary building: part of sequence]

Analysis (3.0 kg): The small flot consisted mainly of plant debris. There were quite a lot of small fragments, limiting identifications (E 2.0-3.5, mode 2.5 weak; F 2.0-4.5, mode 2.5 weak). There were 76 individuals of 51 beetle and bug taxa. A third of the individuals were outdoor forms, among which were an appreciable number of remains which may have entered in cut waterside vegetation, such as might be strewn on a floor (or conceivably form a poor thatch): *Limnobaris pilistriata* (3), *Plateumaris ?affinis* (2), and *Aphrodes flavostriatus*, *Elaphrus cupreus*, *Cercyon tristis*, *Prasocuris phellandrii* (all 1). Species likely to have exploited litter in the building were not very abundant, only *Lathridius minutus* group (5) having more than three individuals; fairly dry conditions were indicated by the decomposers. There was no good evidence for flooding or the importation of water. *Phymatodes testaceus*, of which there were three, is discussed further below.

Context 497 Sample 3215c (497/T in assessment report and database) [floor layer in primary building: interleaved in the above sequence, ?faeces of livestock]

Assessment (1.0 kg): A fairly large flot, mostly moss and herbaceous debris, yielded a little over 20 adult beetles (no bugs), moderate numbers of fly and mite remains, and a few other invertebrates. Preservation was a little variable, sometimes superb but mostly fair (E 1.5-3.5, mode 2.0 weak; F 1.0-4.0, mode 2.5 weak). The beetles were a rather mixed group, with hints of foul matter and species

representing natural or semi-natural habitats. There was no evidence of abundant habitat for decomposers, suggesting clean conditions.

Context 515 Sample 3367c (515/T in assessment and database) [floor layer in primary building: part of sequence, bottom K515 to top K194]

Assessment (1.0 kg): The small flot, which was of varied composition (including rootlets, wood fragments and trace of seeds), contained very few invertebrate remains other than mites. Preservation was good, but there were parts of only four beetles. Presumably input of organic matter to the floor was low, or it was cleaned regularly.

Context 515 Sample 3367/1 (3367c) [floor layer in primary building: part of sequence, bottom K515 to top K194]

Analysis (3.0 kg): The flot was of modest size and contained a small group of fairly well preserved invertebrates (E 1.5-3.0, mode 2.0 weak; F 1.5-4.0, mode 2.5 weak.). There were only 27 adult beetles and bugs, representing 25 taxa. Two-thirds were outdoor forms, and among these a group from water-margin habitats stood out (two *Coelostoma orbiculare* and *Chaetarthria seminulum* and single specimens of Saldidae sp., *Cercyon tristis* and Donaciinae sp.). These, and much of the rest of the fauna, seem likely to have been imported in some way, probably in moss or water. There was no indication of flooding, which would have been expected to introduce a rather different, and wider, range of invertebrates. The presence of four click beetle (Elateridae) larvae, probably *Actenicerus sjaelandicus*, is notable: these may have arrived in turf (or perhaps even moss), but could conceivably have invaded the deposits *in situ.*

Context 515 Sample 3370/1 (3370w) [floor layer in primary building: part of sequence, bottom K515 to top K194]

Analysis (0.3 kg): The flot was quite large, with moss and plant fibres. Invertebrate remains were rare; though their preservation was often quite good, some remains were highly fragmented, limiting identification (E 1.5-3.0, mode 2.0 weak; F 1.5-5.0, mode 3.0 weak). Only 15 adult beetles of 14 taxa were found, in a group dominated by outdoor forms. Mixed origins appears likely, and the entire beetle assemblage may have been background fauna. Some of the other remains, particularly the fly puparia and worm egg capsules, seem likely to have originated *in situ*, and the former hint at the presence of small amounts of decomposing organic matter. Large quantities of organic matter do not seem to have accumulated, however.

Context 521 Sample 3390 (3390h)

Assessment (1.5 kg): The moderately large flot consisted of plant fibres and seeds, together with a modest-sized but distinctive group of insects. Preservation was often quite good, though some remains were very fragmented (E 1.5-3.0, mode 2.0 weak; F 1.5-4.0, mode 2.5 weak). *Hebrus* sp. and *Chaetarthria seminulum* were both rather abundant, and there were two Saldidae sp., several caddis fly larval cases, and some other remains suggesting water margins. Indeed, most of the fauna may have lived in an area of herbaceous vegetation and moss at the edge of water. No indications of flooding were observed, however. There were only weak hints of foul matter, and synanthropes were very rare.

Context 532 Sample 3523c (532/T in assessment report and database) [surface of natural peat preceding first building phase, directly under the building]

Assessment (1.0 kg): The flot was of moderate size, consisting of what appeared to be rootlets, with some leaf fragments and charcoal. The insect fauna was limited, with under 20 adult beetles and bugs,

and there were not very many other remains. Preservation was varied, from good to very poor; chemical erosion appeared to have a bimodal distribution (E 1.5-5.0, modes 1.5 and 4.5 distinct; F 1.5-5, mode 2.5 weak). There were many very decayed scraps of insect cuticle. It was not clear whether this bimodality reflected differential origins of the remains (e.g. those from the 'old' peat, and those which arrived at about the time of burial), but it did not seem to be related to ecological groupings. There were no synanthropic species among the beetles and bugs, the fauna representing marshy conditions with dryer land, perhaps poor grassland, nearby.

Context 532 Sample 3519 (3519h) [surface of natural peat preceding first building phase, directly under the building]

Assessment (1.9 kg): A small flot contained abundant seeds and quite large numbers of invertebrate remains. There were quite a lot of highly fragmented sclerites, but chemical preservation was generally quite good (E 2.0-3.0, mode 2.0 weak; F 1.5-4.0, mode 2.5 weak). The fauna was dominated by outdoor taxa, which contributed over two-thirds of the individuals. Aquatics and waterside species were numerous, and almost the whole fauna may have lived in a marshy area with typical waterside vegetation. There were almost no synanthropes, and those present gave no clear evidence of human presence.

Discussion

Preservation: Preservation varied substantially between sample assemblages, but was also very variable within many of the individual samples. Preservation has two components: chemical degradation and fragmentation (Kenward and Large 1998). The modes for the preservation records for sample assemblages are summarised in Table 4, which show quite strong bunching around 2.0-2.5 for erosion and 2.0-2.5 for fragmentation, which at first sight suggests rather good preservation across the site. However, many remains from Viborg were highly fragmented, often to the extent that identification was impossible. Fragmentation probably reflects pre-burial and burial taphonomy to a large extent, but is also probably brought about by recent assaults such as compression by heavy machinery used in clearance before excavation, the processes of excavation, sample bagging, transport and storage, and (however carefully carried out) of laboratory processing. Subjectively, at the present site the remains of 'outdoor' beetles and bugs were more likely to be severely fragmented than synanthropes, something also noted at a few other sites (e.g. certain floor layers at 16-22 Coppergate, York, Kenward and Hall 1995). A possible reason for fragmentation in shallowly-buried deposits such as those at the Viborg site is compression caused by digging machinery or even the excavator's feet. However, where one component shows more damage, it is possible that it arrived by a different route, already somewhat degraded and therefore more fragile, or suffered a different history once on the site. Possibilities at the present site are importation as corpses in moss, cut vegetation, peat or turf. An origin in peat seems unlikely: peat fossils are generally more chemically decayed than the outdoor component at Viborg, and the *suite* of species recorded was not at all reminiscent of those seen in fen or bog peat. There were often strong hints that cut, hay-like or waterside vegetation was present (see below and sample-by-sample account). Insects in such material, if strewn onto floors, would probably often have been crushed by the occupants' feet. Another possibility is that cut mixed vegetation was used to make poor thatch, the insects caught up in it subsequently being released after long exposure to aerobic decay and wetting and drying (which causes fragmentation).

Chemical degradation may have occurred before layers were sealed, because they accumulated slowly, allowing fossils to be attacked by fungi and bacteria. This would account for the great variation seen in some deposits, since remains exposed for a long period would have decayed, and the more recently-deposited ones, and any insects which were still alive, would have still been fresh. Fossils in some other deposits showed a general trend towards paleness or orange-red colours, and

may have decayed in the sediment after deposition. This may have been in a period before the layer became deeply buried and fully anoxic, but an alternative possibility is recent decay, as a result of changes in the groundwater level. Such changes are suspected to have occurred in York (Kenward and Hall 2000; in press). If this is the case at Viborg, the future status of unexcavated parts of the site needs to be reviewed.

There was mostly no evidence of fossils having completely decayed and thus lost to the record, though this may have happened in a few cases, e.g. Context 480 Sample 3185c, where many remains showed a strong trend to yellow colours, and scraps of rotted cuticle were present, suggesting the possibility that there had been loss of other remains through decay.

The concentration of remains was generally a little low by comparison with other sites. At 16-22 Coppergate, York, England, for example, the mean concentration of adult beetles and bugs (based on MNI) for all periods was 70 per kg; at Mindets Tomt - Sondrefelt in Oslo it was 183, and at Deer Park Farms, Co Antrim, Northern Ireland it was 127 per kg (Kenward and Hall 1995; Kenward 1988; Allison *et al.* 1999a, b). For the present site the value was 27 per kg. A likely explanation is general cleanliness of the occupation surfaces at the site. The floor layers in particular contained unusually small numbers of remains for a site of this date giving good anoxic preservation.

General ecological nature of the fauna: The predominant component of the fauna was a range of taxa associated with decomposing matter of various kinds ('decomposers'). Species coded 'RT' contributed 57% of them individuals, but many uncoded taxa would have co-existed with them. This proportion is, however, substantially lower than at some other sites (compare with data given by Kenward (1997, tables 1-2). This seems to have had two causes: the presence of species which may have been part of the decomposer communities, but which could not be assigned a code for one reason or another, and the abundance of outdoor species.

Outdoor fauna was abundant, taxa coded 'OB' contributing 25% of the individuals (compared with 12% at Coppergate, 18% at Deer Park Farms). Within this component, aquatics were moderately common in some samples, but not generally very important (4% overall). *Coelostoma orbiculare* (12 records, all as one or two individuals) and *Chaetarthria seminulum* (13 records, in two cases six individuals) were more common than is normal in occupation site deposits, presumably reflecting their abundance in local habitats from which resources (perhaps water or moss) were drawn. According to Hansen (1987), both *C. orbiculare* and *C. seminulum* are found mainly in shallow water at the edges of stagnant, nutrient-rich ponds, the first among vegetation and the second in wet mud, though *C. orbiculare* also occurs in acid water, including *Sphagnum* bogs. A number of species seemed to point to the importation of moss from the edge of water, and others may have come from moss in drier places, perhaps under trees. Clear candidates include *Olophrum* sp.(six records) and *Anthobium* sp. (six records), but many of the infrequently-occurring taxa may have come in moss (though other routes are possible for all of these). Many or all of these insects may have been brought in plant litter which had lain by the water's edge for some time, however. The weevil *Rhynchaenus quercus* (variously recorded as positively and tentatively identified remains, and as *Rhynchaenus* sp., which were in fact probably this species; one of the subsamples from Context 218 gave four individuals) is a possible candidate for importation in moss from around trees.

A further species requiring consideration in the context of the possibility that moss was imported is the small staphylinid (rove beetle) *Pycnoglypta lurida*. It was present in ten samples from eight contexts, and particularly common in two samples from Context 218, with 9 and 10 individuals. *Pycnoglypta lurida* is a species very typical of cold tundra-like late-glacial environments in North-West Europe (e.g. in Britain at Gransmoor, Yorkshire, Walker *et al.* 1993), although it is still present in Denmark (Hansen 1951) and widely distributed in Scandinavia (Lindroth 1960). All the fossils from Viborg were in a fresh condition, so they were most unlikely to have been from re-excavated ancient peat. The beetle may have been imported in moss, but as it has been found in so many

samples, the suspicion arises that it was exploiting artificial conditions on the site as a facultative synanthrope. Why *P. lurida* should have been so abundant in Context 218 in particular is not at all clear: was there some special characteristic or activity associated with this context which caused *P. lurida* to be imported or to colonise? There is no obvious reason why it should be associated with *Trox scaber*, the other species which was notable in Context 218. It is also not clear why *P. lurida* became extinct in Britain: it may perhaps be found in medieval archaeological occupation deposits, or indeed still be present but overlooked. The subsamples from Context 218 which gave four individuals of *Rhynchaenus quercus* also gave ten *P. lurida*: is there a connection, via importation in moss?.

Pre-occupation fauna: The area appears to have been marshy, with short vegetation, rather wetter locally. There were hints of foul matter, but nothing to suggest grazing.

Flooding: There is no clear evidence to suggest flooding. All of the aquatics and damp-ground fauna seem more likely to have been brought in waterside moss or vegetation cut from near water (perhaps being left on the ground for a while before fathering), or to be background fauna from the nearby lake. Flood water, and water brought from the lake margins for domestic or industrial use, would be expected to contain large numbers of a wide range of preservable aquatics such as Cladocera, Ostracoda, water beetles and bugs, and immature stages of many groups of insects. Such remains were present, but rare.

Livestock: Although elements of the 'stable manure' insect fauna described by Kenward and Hall (1997) were present, sometimes in modest quantities (e.g. Context 426 Sample 3008 and Context 185 Sample1563c), there were no clear stable manure/byre groups (like those found in Roman deposits at Tanner Row, York, Hall *et al.* 1990, or Ribchester, Cumbria, Carrott *et al.* 2000) were recorded at Viborg, and indeed species typical of such groups were generally not at all abundant. Of such insects, only *Oxytelus sculptus* occurred regularly, but usually in small numbers (17 contexts, 23 samples, 4 and 6 being the largest numbers of individuals); it probably exploited a range of somewhat foul habitats. *Aphodius* dung beetles were not very abundant (usually one or two individuals, occasionally three, though often 1-3 species per assemblage) and livestock was probably generally at some distance and not moving freely around the site. The large dung beetle *Geotrupes* was frequently present as single individuals (28 samples, 24 contexts), though it is so easily recognised that even minute fragments such as might occur in the general trample and scatter of the site will have been recorded. *Geotrupes* are often seen during excavation, being large and metallic blue in colour, and were common among the 'spot finds' (though these have not been recorded systematically). All these dung beetles fly freely and sometimes in large numbers.

Lice of livestock were not very often encountered in the assemblages from Viborg. There was a single record of a pig louse, *Haematopinus ?apri*. *Damalinia* species, the other lice of stock commonly found in archaeological deposits, were present in a few samples. Most could not be more closely identified, and indeed were usually only tentatively named to genus, but a sample from Context 165 gave large numbers (around 40 individuals), some of which could reasonably confidently by named as *D. ovis*, found on sheep. Records of *D. ovis* from occupation deposits generally appear to relate to wool cleaning, as at 16-22 Coppergate, York (Kenward and Hall 1995). Whether this was the case at Viborg is uncertain, but it is a reasonable hypothesis. In contrast to the occasional abundance of *Damalinia*, Only one adult and one puparial *Melophagus ovinus* were found, both only tentatively identified, from two separate samples.

This lack of evidence for livestock suggests that the cut vegetation component, if it was such, came with plants used to sweeten floors for human use, or perhaps for poor thatch. Many of the samples gave groups of insects which might be found together in well drained to marshy meadowland, and a possible route to the site is in cut vegetation. This may have been specifically hay, or 'rushes' cut to be strewn on floors, or material used for roofing: or indeed, all of these. While many of the insects concerned (they were mainly Chrysomelidae and Curculionidae: leaf beetles and weevils) may have

been part of the background fauna, soft, newly-emerged remains of some, particularly *Apion* species, were rather common. These must have been imported, unless they actually lived where they were found, and much the most likely explanation is that they were brought with their host plants. (Such 'hay' insects, their role in the identification of stable manure, and the routes by which fauna may arrive in manure, are discussed by Kenward and Hall (1997) and Hall and Kenward (1998). At Viborg, the use of cut vegetation in floor litter seems rather likely, though it would be hard to distinguish this from its use in thatching, since remains of plants and insects in thatch are likely often to have fallen to the floor.

Some components of the outdoor fauna may have come with turf, another possible roofing material (and often used for levelling and crude construction work). The chafer beetle *Phyllopertha horticola* may have been imported with cut vegetation or turf, or have simply been so abundant locally as to be near-ubiquitous in the background fauna. It was recorded from 39 samples from 26 contexts, usually as single individuals, though sometimes in twos or threes. It can be identified from quite small fragments, so may be a little over-represented by comparison with less distinctive species.

Heath and moor: There were a few records of some species most likely to have entered with resources gathered from heath or moorland habitats: the bug *Ulopa* , probably but not certainly *reticulata,* from a few samples, the ground beetle *Dyschirius globosus* from eight contexts, usually one or two individuals, but in one case four; and a single record of the weevil *Micrelus ericae*.

Synanthropes: Species coded as synanthropes - here used to mean species favoured by artificial habitats found on occupation sites - are listed in Table 5. The range of species is broadly like that seen at other occupation sites, but dominated by two: *Cercyon analis* and *Lathridius minutus* group. *Cryptophagus* and *Corticaria* species approach these is abundance when amalgamated, as would the combined *Atomaria* species (this are very typical of occupation sites but extremely common in non-synanthropic habitats too, so not coded). The range of synanthropes appeared limited by comparison with many other occupation sites, especially urban ones, and this is accentuated if those species represented by very small numbers of records (and thus perhaps never established at the site) are eliminated. Notable absentees were *Tenebrio* and *Blaps* species, although *though Laemostenus terricola* was occasionally present. The more abundant synanthropes, taken together, suggest conditions which ranged from fairly dry to locally foul, with the drier end of the spectrum generally predominating.

The main statistics for the site fauna as a whole suggest that synanthropes were not as strongly represented as in urban and some other rural sites (Tables 2, 6). It should be noted, however, that these figures are substantially affected by the presence of other components, for example the strength of the outdoor fauna, and in two cases by *Aglenus brunneus*, which is frequently extremely abundant. The first problem is overcome by examining the internal structure of the synanthropic fauna (Table 7). This shows that species designated as facultative synanthropes (and it should be remembered that the classification is inevitably somewhat arbitrary) are far more important at Viborg than at the contemporaneous site of Coppergate, York, or the small isolated rural site of Deer Park Farms, County Antrim, Northern Ireland (Allison *et al.* 1999a-b; Kenward 1997; Kenward and Allison 1994; Kenward and Hall 1995). Indeed, this component gives a value closest to that for the isolated Early Christian lake dwelling at Buiston, Ayrshire, Scotland (Kenward 1997; Kenward et al. 2000a-c). This value probably reflects the degree to which more specialised synanthropes, less likely to have been abundant in the wild locally and therefore relying on trade and the passage of time, had been able to colonise and survive. The data for Viborg suggest isolation, a very new settlement, or intermittent occupation. These figures are skewed by the presence of abundant *Aglenus brunneus* at Coppergate and DPF, which probably bred in the deposits post-depositionally. Removing *A. brunneus* gives a rather different picture (Table 8), strongly emphasising the similarity between Deer Park Farms and Coppergate, and between Viborg and Buiston. A further way of examining the synanthropes is via their contribution to the decomposer fauna of the site (Table 9), providing a measure of (a) the range,

permanence and abundance of artificial habitats and (b) the likely source of colonisation (local natural habitats versus established artificial ones). This does not appear so clear-cut, but again the data for Viborg lie closer to those for Buiston, though not representing so extreme a case.

Cercyon analis, although usually common in archaeological deposits, was more important than usual at Viborg, perhaps because it is (a) very eurytopic (i.e. able to exploit a wide range of habitats) and (b) commoner in semi-natural conditions. Possibly many other species which are often important at occupation sites did not find habitat often enough to be omnipresent? At Viborg *C. analis* contributed 6.5% of the adult beetles and bugs; at Coppergate the figure was 1.9%, a value unchanged by removing *Aglenus brunneus*. The other decomposer beetle which was especially common at Viborg was *Lathridius minutus* group, which contributed 7 % of the adult beetles and bugs. However, this was not outstandingly higher than at other sites (the value for Coppergate was 5% after removal of *A. brunneus*, for example).

The blind burrowing beetle *Aglenus brunneus* (discussed by Kenward 1975) itself *was* recorded from Viborg, but not in large numbers: it was present in two samples, with a total of four individuals. It is not certain whether it was part of the occupation site fauna, as surely must have been at least partly the case at York, or a post-depositional invader. Perhaps it never established itself at Viborg as there were no very long-lived and extensive spreads of rotting matter such as clearly existed in York and at Deer Park Farms.

Two other synanthropes recorded from Viborg deserve consideration. *Xylodromus* fossils were noted in 20 samples from 18 contexts, in numbers ranging from one to five. They were often recorded as *X. concinnus* but, as at some other sites, the fossils were sometimes strikingly variable, and there may have been more than one species present (there are three other *Xylodromus* species which might occur in a Danish site, Freude *et al.* 1964; Hansen 1951). The second synanthrope of note is *Ptinus raptor*, a distinctive spider beetle not previously encountered as archaeological material by the author. Hinton (1941) records it from warehouses and beehives, and Palm (1959) from hay and straw in buildings and in decaying leaves and old birds' nests, with a record from the bark of a hollow oak tree. It probably lived in the buildings, though why it and not the generally more frequently encountered *P. fur* should be represented is uncertain: one possibility is that it was able to invade simply by chance, another aspect of the unusual synanthropic component of the site.

Conditions on the floors appear usually to have been very clean by comparison with many other sites, at least in terms of organic matter suitable for invasion by insects (compare with the seething fauna of the near-contemporaneous floors in York, e.g. Kenward and Hall 1995; Hall and Kenward 2000), or the rather earlier ones at the small rural site of Deer Park Farms, Northern Ireland (Allison *et al.* 1999a-b; Kenward and Allison 1994b). This may be related to industrial/craft use of the structures, although domestic occupation is just possible if floors were swept very frequently. The insects will not, of course, reveal the presence of non-organic filth on flors, such as ash and inorganic wastes.

Parasites of humans: *Pulex irritans*, the human flea, was record from 13 samples from 12 contexts, normally as 1-2 individuals, but there were six from a sample from Context 257. *P. irritans* is typically most common in floor deposits, where they may be very abundant, at archaeological sites, but seems also to have bred in stable floors (Kenward and Hall 1997), and probably elsewhere (the larvae live in litter). Its remains are likely to occur anywhere that waste was dumped, especially in pits. Adult fleas are very mobile, and single individuals therefore have little significance. There were four records of the human louse, *Pediculus humanus*, always of one or two individuals. Such small numbers do not offer evidence for domestic activity: compare the abundance of this species at Coppergate, York (Kenward and Hall 1995) and Deer Park Farms, Northern Ireland (Allison *et al.* 1999a-b; Kenward and Allison 1994).

Honey bees, *Apis mellifera*, were positively identified from three contexts, but there were remains which were almost certainly this species from eight further samples (Table 10). These insects may have entered the deposits accidentally - simply dying of old age, or drowning while drinking, for example - but an alternative route is as a result of human exploitation of honeycomb for wax and honey. Remains may have been ejected while these products were being purified, or may quite possibly have passed through peoples' intestines, having been accidentally ingested with food or drink. The numbers are too small to stand as evidence of bee-keeping. British records of honey bees, and the means by which they may have entered archaeological deposits, are discussed by Kenward (in press).

***Trox scaber* and tanning**: The very distinctive scarabaeid beetle *Trox scaber* was identified from 16 samples, representing nine contexts. It was usually present in small numbers (in fact as single individuals), as is the case for many archaeological occupation sites (e.g. Kenward and Hall 1995). But assessment had showed this beetle to be unusually abundant in Sample 1835 from Context 218. There was also much rotted bark and some bark sclereids, and tree leaf fragments and some buds (including those of oak, *Quercus*), and some leather scraps (see sample-by-sample account above). (It should be emphasised, however, that leather offcuts do not indicate tanning: certainly in urban sites, the vile-smelling tanning and highly skilled leather-working processes may generally have been well separated spatially and located in different social zones. In York tanning seems to have occurred some hundreds of metres away from the area in which leather-workers plied their trade, Hall and Kenward 1999; 2000). Hall and Kenward (2003) argue that the combination of numerous *T. scaber* and abundant bark sclereids may be part of an indicator group for tanning pit waste, the beetle perhaps invading stored untanned skins or being attracted to some odour emitted by the tan pit. In view of this, Context 218 was investigated using a series of further subsamples, six being examined in some way. Remains of *T. scaber* adults were consistently present and, remarkably, parts of the head capsules of *Trox* larvae (identified following Klausnitzer1996) were also present in three subsamples, and abundant in one (Table 11). Clearly some factor in, near to, or at the source of some component of, the forming Context 218 favoured *T. scaber*. The description of the context as a mixed deposit suggests dumping, and it seems possible that tanning waste was one of the materials being disposed of.

Dead wood fauna: The longhorn beetle *Phymatodes testaceus* was found in ten samples from eight contexts, 1-3 specimens being noted in each case. *P. testaceus* bores in the bark of a wide range of coniferous and broad-leafed trees, or (where the bark is thin) at the interface of the bark and the wood (Duffy 1953). Duffy stated that it was often of economic importance in the tanbark industry where oak (or hemlock) bark was stored; he quoted a source which recommended using bark before it was three years old to avoid this problem. Thus, as pointed out by Hall and Kenward (1993), the beetle is a possible candidate for inclusion in the indicator group for tanning, since it has been found in oak bark stored for tanning. In total, four specimens were found in three samples from Context 218, suggesting a higher frequency than in the site as a whole, a suspicious co-occurrence with the abundance of *Trox scaber*. However, it may have lived in structural timber or been imported in firewood.

A remarkable feature of the insect fauna of the Viborg site was the rarity of the woodworm beetle *Anobium punctatum*. In fact, there were no positive identifications, and only a single tentative one, despite the fact that even very minute *Anobium* fragments can be identified to genus at least. *A. punctatum* is one of the most frequently-occurring beetles in occupation site deposits, both urban and rural. For example, it occurred in 290 of 481 contexts in urban deposits associated with structures at 16-22 Coppergate, York; even at the rural site at Deer Park farms, where substantial timbers were rare, it was present in 13 of 112 contexts. It is hard to believe that this near-ubiquitous beetle, which can utilise both conifer and broad-leaf timber, was absent from natural habitats around Viborg, so some factor seems to have operated against its colonising the site. Although the evidence is not clear, it is said that *A. punctatum* is normally unable to utilise timber until it has aged (presumably been exposed to fungal decay) for a considerable number of years; it utilises both sapwood and heartwood

(Hickin 1975). One explanation for its rarity at Søndersø may be that timber never had the opportunity to 'mature' sufficiently for the beetle to invade. This would imply that each phase of building was very short lived, and that little timber was re-used. *A. punctatum* was probably not at all abundant nearby, either, since it flies freely and was probably a common component of the background fauna at many sites in the past; Kenward and Large (1998b) suggested that fragments may have blown around in the dust on the Coppergate site, York. Timber on the site at Viborg was certainly suitable for invasion by beetles, since the powder-post beetle *Lyctus linearis* was present in 14 samples from13 contexts, always as one or two individuals. *L. linearis* attacks sapwood, and is restricted to hardwoods according to Hickin.(1975), and appears to be able to attack quite fresh wood.

Other deadwood species recorded at Søndersø are listed in Table 13. All have come from dead wood of broadleaf trees brought to the site for firewood, but they may also have come with woodland moss or even have colonised structural wood on the site. It is just possible that some deadwood-associated species were brought with bark for tanning, although they were fairly generally distributed across the samples. They suggest that there were patches of quite mature woodland, probably with plenty of dead wood, nearby.

The bark beetle *Scolytus rugulosus* may represent a separate case. It (or *Scolytus* sp., almost certainly *rugulosus*) was present in nine samples from seven contexts at Viborg, and probably present (as unidentifiable remains) in a further one. According to Balachowky (1949), this beetle is typically found in small (3-4 cm) branches of trees and shrubs of the rose family (Rosaceae), including fruit trees, with only one record from *Corylus* (hazel). *S. rugulosus* is occasionally found in occupation deposits of the Anglo-Scandinavian period in York, and Hall and Kenward (2000) rather hesitantly suggested that it may have exploited dead branches of fruit trees in the town. At Viborg it may have emerged from imported firewood, but the possibility that it lived in rosaceous trees, and even fruit trees, near to the site, is worth consideration.

Imported materials have been alluded to frequently: in summary, it appears likely that cut vegetation was brought to the site regularly and in substantial quantities. This was perhaps gathered from a range of environments, ranging from fairly dry meadowland to swamp. It is just possible that turf was used, and there are strong indications of the importation of moss. Dead wood was probably brought as firewood, and there are rather strong hints that bark was brought for tanning. Some of the fauna may have arrived in water.

At the start of this report a series of aims and questions were stated. To what extent have these been met or answered? Most have been. A range of information concerning ecological (and thus human living) conditions at the site, activity, and deposit formation processes has certainly been obtained. That the input of insect remains into many of the deposits has been established, and the most probable explanation is non-domestic use of the structures. The reconstruction of vegetation and land use at prior to construction has not been greatly enhanced from the assessment, but useful data have been obtained. The (apparently) low synanthrope diversity at Viborg can reasonably confidently be ascribed to the fact that occupation was newly-established, though industrial use may have restricted this component too. Honey bees have been shown to be regular and frequent in the deposits, and the exploitation of bee products appears likely, but there were not sufficient remains to suggest beekeeping. No beeswax (see Kenward and Hall 1995, 765-767) was found in flots from the samples, though it was not possible to examine the residues. The concentration of *Trox scaber* found in one layer has been proven; it is not certain whether this was related to the storage or processing of skins, but the presence of a bark-feeding longhorn beetle perhaps adds a little more evidence in favour of tanning. The insect remains certainly provided evidence of the importation of materials, almost certainly cut vegetation and moss, and perhaps turf (integration of evidence from the botanical studies will surely clarify this). - The rarity of ectoparasites of humans or livestock in the assessment did reflect generally low numbers, but human fleas and lice were present, and in one case sheep parasites

were numerous. No evidence could be found for flooding, aquatics almost certainly arriving by other routes.

The importance of integration and feedback, with other evidence, especially with botanical results, was emphasised: this *Technical Report* represents a stage enabling the integration process.

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*Table 1. Complete list of invertebrate remains recorded from samples from the Viborg Søndersø site. Order and nomenclature follow Kloet and Hincks (1964-77) for insects. Where both secure and tentative identifications for a given taxon were recorded, only the former are listed here. Ecological codes used in calculating statistics (Appendix 2 etc.) are given (they are explained in Table 2) together with the number of samples in which each taxon was recorded. * = not used in calculating assemblage statistic; No recs - number of records; ec - ecological code. s. The remains were of adults unless stated. 'Sp.' indicates that record was probably an additional taxon, 'sp. indet.' that the material may have been of a taxon listed above it.*

Taxon	No recs	ec
ANELLIDA: OLIGOCHAETA		
*Oligochaeta sp. (egg capsule)	27	u
CRUSTACEA		
**Daphnia* sp. (ephippium)	6	oa-w
*Cladocera spp. (ephippium)	8	oa-w
*Ostracoda sp.	1	u
DIPLOPODA		
*Diplopoda sp.	2	u
INSECTA		
DERMAPTERA		
**Forficula* sp.	4	u
*Dermaptera sp. indet.	1	u
MALLOPHAGA		
**Damalinia ovis* (Schrank)	1	u
**Damalinia* sp. indet.	1?4	u
*Mallophaga sp.	1	u
SIPHUNCULATA		
**Haematopinus ?apri* Goureau	2	u
**Pediculus humanus* Linnaeus	3	ss
HEMIPTERA		
*Pentatomidae sp. (nymph)	2	oa-p
?Heterogaster urticae (Fabricius)	2	oa-p
Trapezonotus sp.	1	oa-p
Drymus brunneus (Sahlberg)	2	oa-p
Lygaeidae sp.	7	oa-p
Empicoris sp.	2	u
Temnostethus sp.	1	oa
Lyctocoris campestris (Fabricius)	1	rd-st
Saldula sp.	3	oa-d
Chartoscirta sp.	1	oa-w
Saldidae sp.	8	oa-d
Hebrus ?ruficeps (Thomson)	1	oa-w
Hebrus sp. indet.	4	oa-w
Microvelia sp.	1	oa-w
Gerris sp.	1	oa-w

Corixidae sp.	3	oa-w
*Heteroptera sp. (nymph)	4	u
Heteroptera sp.	1	u
Aphrophora sp.	1	oa-p
Philaenus spumarius (Linnaeus)	1	oa-p
Cercopidae sp.	1	oa-p
Ulopa ?reticulata (Fabricius)	3	oa-p-m
Aphrodes flavostriatus (Donovan)	3	oa-p-d
Aphrodes sp.	1	oa-p
Auchenorhyncha sp.	2	oa-p
Cicadellidae spp. and spp. indet.	11	oa-p
Conomelus anceps (Germar)	2	oa-p
Delphacidae sp.p	12	oa-p
Auchenorhyncha sp.	1	oa-p
*Auchenorhyncha sp.indet. (nymph)	16	oa-p
Craspedolepta sp.	1	oa-p
Psylloidea sp.	3	oa-p
*Psylloidea sp. indet. (nymph)	1	oa-p
*Aphidoidea sp.	8	u
*Coccoidea sp.	8	u
*Hemiptera sp. (nymph)	1	u
TRICHOPTERA		
*Trichoptera sp. (case)	3	oa-w
LEIPIDOPTERA		
*Lepidoptera sp. (pupa)	3	u
DIPTERA		
*Psychodidae sp.	1	u
*Chironomidae sp. (larva)	1	w
*Bibionidae sp.	7	u
*Syrphidae sp. (larva)	6	u
**?Melophagus ovinus* (puparium) (Linnaeus)	1	-
**?Melophagus ovinus* (adult) (Linnaeus)	1	u
*Diptera sp. (adult)	19	u
*Diptera sp. (larva)	4	u
*Diptera sp. (puparium)	53	u
*Diptera sp. (pupa)	17	u
**Pulex irritans* Linnaeus	13	ss
*Siphonaptera sp.indet.	7	u
COLEOPTERA		
Cychrus rostratus (Linnaeus)	1	oa
Carabus sp.	1	oa
Notiophilus sp.	2	oa
Elaphrus cupreus Duftschmid	3	oa-d
Elaphrus sp. indet.	2	oa-d
Dyschirius globosus (Herbst)	6	oa
Dyschirius sp. indet.	2	oa

Clivina fossor (Linnaeus)	1	oa
Patrobus sp.	1	oa
Trechus ?rivularis (Gyllenhal)	1	oa-d
Trechus ?secalis (Paykull)	1	oa-d
Trechus sp.	3	ob
Bembidion sp.	2	oa
Tachys sp.	3	oa
Pterostichus diligens (Sturm)	2	oa-d
Pterostichus melanarius (Illiger)	4	ob
Pterostichus nigrita (Paykull)	5	oa-d
Pterostichus (*Poecilus*) sp.	1	oa
Pterostichus spp. indet.	18	ob
?Calathus sp.	2	oa
Laemostenus terricola (Herbst)	2	ss
Agonum sp.	1	oa
Amara sp.	4	oa
Harpalus rufipes (Degeer)	1	oa
?Harpalus sp.	1	oa
?Bradycellus sp.	1	oa
Carabidae spp. and spp. indet.	24	ob
Hydroporinae sp.	1	oa-w
Colymbetinae sp.	3	oa-w
Dytiscidae sp.	1	oa-w
Helophorus ?aquaticus (Linnaeus)	1	oa-w
Helophorus aquaticus or *grandis*	8	oa-w
Helophorus spp.	15	oa-w
Coelostoma orbiculare (Fabricius)	12	oa-w
Cercyon analis (Paykull)	39	rt-sf
Cercyon atricapillus (Marsham)	9	rf-st
Cercyon haemorrhoidalis (Fabricius)	17	rf-sf
Cercyon melanocephalus (Linnaeus)	1	rt-sf
Cercyon terminatus (Marsham)	5	rf-st
Cercyon tristis (Illiger)	8	oa-d
Cercyon convexiusculus group indet.	1	oa-d
Cercyon unipunctatus (Linnaeus)	9	rf-st
Cercyon ustulatus (Preyssler)	4	oa-d
Cercyon spp. indet.	12	u
Megasternum obscurum (Marsham)	16	rt
Cryptopleurum minutum (Fabricius)	15	rf-st
Hydrobius fuscipes (Linnaeus)	15	oa-w
?Anacaena sp.	1	oa-w
Laccobius sp.	2	oa-w
Enochrus sp.	1	oa-w
Chaetarthria seminulum (Herbst)	15	oa-w
Hydrophilinae sp.	1	oa-w
Sphaerius acaroides Waltl	3	u
Acritus nigricornis (Hoffmann)	15	rt-st
Histerinae sp.	2	rt
Ochthebius sp.	4	oa-w
Hydraena sp.	11	oa-w
Ptenidium spp.	24	rt
Acrotrichis spp.	15	rt
Ptiliidae sp.	4	u

*Ptiliidae sp. (pupa)	1	u
Catops sp.	8	u
Catopinae sp.	1	u
Aclypea opaca (Linnaeus)	1	ob-rt
Silphidae sp.	1	u
Scydmaenidae sp.	5	u
Micropeplus fulvus Erichson	1	rt
Micropeplus sp. indet.	1	rt
Megarthrus sp.	2	rt
Proteinus sp.	1	rt
Anthobium sp.	6	oa
Olophrum ?fuscum (Gravenhorst)	1	oa
Olophrum sp.	5	oa
Acidota crenata (Fabricius)	2	oa
Acidota sp.	1	oa
Lesteva longoelytrata (Goeze)	2	oa-d
Lesteva sp. and sp. indet.	2	oa-d
Eusphalerum sp.	3	rt
Pycnoglypta lurida (Gyllenhal)	10	rt
Phyllodrepa salicis (Gyllenhal)	4	rt-sf
Dropephylla ioptera (Stephens)	1	u
Dropephylla sp.	2	u
Omalium excavatum Stephens	4	rt-sf
Omalium sp.	4	rt
Xylodromus concinnus (Marsham)	9?20	rt-st
Omaliinae spp.	5	rt
Coprophilus striatulus (Fabricius)	3	rt-st
Carpelimus bilineatus Stephens	23	rt-sf
Carpelimus elongatulus (Erichson)	1	oa-d
Carpelimus ?gracilis (Mannerheim)	1	u
Carpelimus pusillus (Gravenhorst)	1	rt-sf
Carpelimus rivularis (Motschulsky)	5	ob-d
Carpelimus bilineatus or *rivularis*	5	u
Carpelimus spp. and spp. indet.	15	u
Platystethus arenarius (Fourcroy)	31	rf
Platystethus cornutus group	8	oa-d
Platystethus ?nitens (Sahlberg)	1	oa-d
Anotylus nitidulus (Gravenhorst)	19	rt
Anotylus rugosus (Fabricius)	26	rt
Anotylus ?tetracarinatus (Block)	1	rt
Oxytelus sculptus Gravenhorst	23	rt-st
Oxytelinae sp. indet.	1	u
Stenus spp.	39	u
Euaesthetus bipunctatus (Ljungh)	1	oa
Lathrobium spp.	7	u
Ochthephilum sp.	1	oa-d
Medon sp.	1	u
Lithocharis ochracea (Gravenhorst)	1	rt-st
?Lithocharis sp.	1	rt
Rugilus orbiculatus (Paykull)	5	rt-sf
Rugilus sp.indet.	5	rt
Paederinae sp.	1	u
Othius myrmecophilus Kiesenwetter	1	rt

Othius sp.	8	rt
Leptacinus ?intermedius Donisthorpe	1	rt-st
Leptacinus pusillus (Stephens)	3	rt-st
Leptacinus sp. indet.	12	rt-st
Gyrohypnus angustatus Stephens	1?10	rt-st
Gyrohypnus fracticornis (Muller)	24	rt-st
Gyrohypnus sp. indet.	4	rt
Xantholinus linearis (Olivier)	2	rt-sf
Xantholinus longiventris Heer	1	rt-sf
Xantholinus sp .indet.	5	u
Xantholininae sp. indet.	1	u
Neobisnius sp.	7	u
Philonthus spp.	36	u
Philonthus or *Gabrius* sp.	3	u
Staphylinus sp.	1	u
Creophilus maxillosus (Linnaeus)	1	rt
Quedius cinctus (Paykull)	5	rt
Quedius spp.	9	u
Philonthus or *Quedius* sp. indet.	1	u
Staphylininae spp. indet.	17	u
Sepedophilus sp.	1	u
Tachyporus obtusus (Linnaeus)	1	u
Tachyporus sp.	5	u
Tachinus laticollis or *marginellus*	1	u
Tachinus signatus Gravenhorst	2	u
Tachinus sp. indet.	2	u
Cordalia obscura (Gravenhorst)	16	rt-sf
Falagria caesa or *sulcatula*	3	rt-sf
Falagria sp. indet.	12	rt-sf
Falagria or *Cordalia* sp. indet.	8	rt-sf
Crataraea suturalis (Mannerheim)	4?3	rt-st
Aleochara sp.	2	u
Aleocharinae spp.	47	u
Staphylinidae sp. indet.	1	u
Pselaphidae spp.	12	u
Sinodendron cylindricum (Linnaeus)	2	l
Trox scaber (Linnaeus)	13	rt-sf
**Trox scaber* (larva)	3	rt-sf
Geotrupes sp.	28	oa-rf
Aphodius ?contaminatus (Herbst)	2	oa-rf
Aphodius ?fimetarius (Linnaeus)	1	oa-rf
Aphodius prodromus (Brahm)	7	ob-rf
Aphodius villosus Gyllenhal	2	oa-p
Aphodius spp. and spp. indet.	38	ob-rf
Melolontha sp.	2?1	oa-p
Phyllopertha horticola (Linnaeus)	42	oa-p
?Cetonia sp.	1	oa
Melolonthinae/Rutelinae/Cetoninae sp.	2	oa-p
Clambus pubescens Redtenbacher	3	rt-sf
Clambus sp.	10	rt-sf
Cyphon padi (Linnaeus)	4	oa-d
Cyphon sp.	3	oa-d
Scirtidae sp. indet.	1	oa-d

Simplocaria ?semistriata (Fabricius)	5	oa-p
Byrrhidae sp. indet.	1	oa-p
Dryops sp.	1	oa-d
**?Lacon quercus* (Herbst) larva)	1	oa
**Melanotus erythropus* (Gmelin) larva)	1	l
**?Actenicerus sjaelandicus* (Muller) (larva)	1	001L
**?Denticollis linearis* (Linnaeus) (larva)	1	u
Elateridae spp	9	ob
*Elateridae sp. (larva)	7	ob
Cantharidae sp.	3	ob
Dermestes sp.	1	rt-sf
Dermestidae sp. indet.	4	rt-sf
Anobium ?punctatum (Degeer)	1	l-sf
?Ptilinus pectinicornis (Linnaeus)	1	l-sf
Ptinus ?fur (Linnaeus)	2	rd-sf
Ptinus raptor Sturm	12	rd-sf
Ptinus sp. indet.	17	rd-sf
Lyctus linearis (Goeze)	14	l-sf
Necrobia violacea (Linnaeus)	1	rt-sf
?Kateretes sp.	1	oa-p-d
Brachypterus sp.	5	oa-p
Meligethes sp.	1	oa-p
Epuraea sp.	1	u
Omosita colon (Linnaeus)	1	rt-sf
Omosita sp. indet.	6	rt-sf
Rhizophagus ?bipustulatus (Fabricius)	2	l
Rhizophagus parallelocollis Gyllenhal	2	rt-sf
Rhizophagus sp. indet.	7	u
Monotoma picipes Herbst	2	rt-st
Monotoma sp. and sp.indet.	7	rt-sf
Cryptophagus scutellatus Newman	3	rd-st
Cryptophagus spp	44	rd-sf
Atomaria spp	33	rd
Ephistemus globulus (Paykull)	26	rd-sf
Olibrus aeneus (Fabricius)	1	oa-p
Cerylon ferrugineum Stephens	6	l
Orthoperus sp.	20	rt
Adalia ?decimpunctata (Linnaeus)	1	oa-p
Coccinellidae sp.	1	oa-p
Lathridius minutus group	44	rd-st
Enicmus sp.	7	rt-sf
Corticaria elongata (Gyllenhal)	2	rt-sf
Corticaria sp.	37	rt-sf
Corticarina sp.	2	rt
Cortinicara gibbosa (Herbst)	2	rt
Corticarina or *Cortinicara* sp. indet.	rt	
Cisidae sp.	1	l
Litargus connexus (Fourcroy)	1	u
Typhaea stercorea (Linnaeus)	1	rd-ss
Aglenus brunneus (Gyllenhal)	2	rt-ss
Salpingus sp.	1	l
Rhinosimus ruficollis (Linnaeus)	1	l
Rhinosimus sp. indet.	1	l

Orchesia undulata Kraatz	1	l
Anaspis sp.	1	ob
Anthicus floralis or *formicarius*	5	rt-st
Rhagium bifasciatum Fabricius	1	oa-p
Phymatodes testaceus (Linnaeus)	10	l
Cerambycidae sp.	1?3	l
Bruchus rufimanus Boheman	1	st
Bruchidae sp. and sp. indet.	3	u
Plateumaris affinis (Kunze)	2	oa-d-p
Plateumaris sp. indet.	10	oa-d-p
Donaciinae sp. indet.	7	oa-d-p
Lema or *Oulema* sp.	1	oa-p
Chrysolina ?fastuosa (Scopoli)	1	oa-p
Chrysolina sp.	1	oa-p
Phaedon ?armoraciae (Linnaeus)	1	oa-p
Phaedon ?cochlaeriae (Fabricius)	1	oa-p
Phaedon sp. indet.	3	oa-p
Prasocuris phellandrii (Linnaeus)	3	oa-p-d
Chrysomelinae spp. and spp. indet.	13	oa-p
Galerucella sp.	3	oa-p
Phyllotreta sp.	1	oa-p
Longitarsus sp.	2	oa-p
Altica sp.	2	oa-p
Chaetocnema arida group	6	oa-p
Chaetocnema concinna (Marsham)	2	oa-p
Chaetocnema sp.	2	oa-p
Psylliodes sp.	2	oa-p
Halticinae sp.	6	oa-p
Brachytarsus ?nebulosus (Forster)	1	oa
Apion (*Oxystoma*) *cerdo* Gerstaecker	1	oa-p
Apion (*Oxystoma*) *pomonae* (Fabricius)	1	oa-p
Apion (*Oxystoma*) sp. indet.	4	oa-p
Apion spp.	29	oa-p
Otiorhynchus porcatus (Herbst)	1	oa-p
Phyllobius sp.	1	oa-p
Phyllobius or *Polydrusus* sp.	1	oa-p
Strophosomus sp.	3?3	oa-p
Sitona lepidus Gyllenhal	2	oa-p
Sitona ?suturalis Stephens	1	oa-p
Sitona spp.	5	oa-p
Hypera sp.	8	oa-p
Magdalis sp.	1	oa-p
?Thryogenes sp.	1	oa-p
Micrelus ericae (Gyllenhal)	1	oa-p-m
Ceutorhynchus sp.	6	oa-p
?Rhinoncus sp.	1	oa-p
Phytobius sp.	4	oa-d
Ceuthorhynchinae spp. and spp. indet.	6	oa-p
Limnobaris pilistriata (Fabricius)	6?3	oa-p-d
Anthonomus sp.	2	oa-p
Gymnetron ?antirrhini (Paykull)	1	oa-p
Gymnetron labile (Herbst)	5	oa-p
Gymnetron sp. indet.	2?6	oa-p

Rhynchaenus quercus (Linnaeus)	3?7	oa-p
Curculionidae spp. and spp. indet.	24	oa
Scolytus rugulosus (Muller)	6?3	l
Dryocoetinus ?villosus (Fabricius)	1	l
Taphrorychus bicolor (Herbst)	1	l
Xyloterus domesticus (Linnaeus)	1	l
Scolytidae sp. and sp. indet.	3	l
Coleoptera spp. and spp. indet.	13	u
*Coleoptera sp. indet. (larva)	39	u
HYMENOPTERA		
*Proctotrupoidea sp.	17	u
*Chalcidoidea spp.	21	u
*Hymenoptera Parasitica sp.	17	u
*Formicidae sp.	20	u
**Apis mellifera* Linnaeus	3?8	u
*Apoidea sp. indet.	3	u
*Hymenoptera sp.	12	u
*Insecta sp. (larva)	3	u
*Insecta sp. (pupa)	1	u
*Insecta sp. (larval case)	2	u
ARACHNIDA		
*Aranae sp.	25	u
*Acarina sp.	52	u

Table 2. Abbreviations for ecological codes and statistics used for interpretation of insect remains in text and tables.

Taxon	No recs	ec
*Oligochaeta sp. (egg capsule)	27	u
**Daphnia* sp. (ephippium)	6	oa-w
*Cladocera sp. (ephippium)	1	oa-w
*Cladocera sp. F (ephippium)	7	oa-w
*Cladocera sp. S (ephippium)	2	oa-w
*Ostracoda sp.	1	u
*Diplopoda sp.	2	u
*Forficula sp.	4	u
*Dermaptera sp.	1	u
**Damalinia ovis* (Schrank)	1	u
*Damalinia sp.	1?4	u
*Mallophaga sp.	1	u
**Haematopinus ?apri* Goureau	1	u
**Pediculus humanus* Linnaeus	4	ss
*Pentatomidae sp. (nymph)	2	oa-p
?Heterogaster urticae (Fabricius)	2	oa-p
Trapezonotus sp.	1	oa-p
Drymus brunneus (Sahlberg)	1	oa-p
Drymus ?brunneus (Sahlberg)	1	oa-p
Lygaeidae sp.	7	oa-p
Empicoris sp.	2	u
Temnostethus sp.	1	oa
Lyctocoris campestris (Fabricius)	1	rd-st
Saldula sp.	3	oa-d
Chartoscirta sp.	1	oa-w
Saldidae sp.	8	oa-d
Hebrus ?ruficeps (Thomson)	1	oa-w
Hebrus sp.	4	oa-w
Microvelia sp.	1	oa-w
Gerris sp.	1	oa-w
Corixidae sp.	3	oa-w
*Heteroptera sp. (nymph)	4	u
Heteroptera sp.	1	u
Aphrophora sp.	1	oa-p
Philaenus spumarius (Linnaeus)	1	oa-p
Cercopidae sp.	1	oa-p
Ulopa ?reticulata (Fabricius)	3	oa-p-m
Aphrodes flavostriatus (Donovan)	3	oa-p-d
Aphrodes sp.	1	oa-p
Auchenorhyncha sp.	2	oa-p
Cicadellidae sp.	11	oa-p
Conomelus anceps (Germar)	1	oa-p
?Conomelus anceps (Germar)	1	oa-p
Delphacidae sp.	7	oa-p
Delphacidae sp. A	5	oa-p
Delphacidae sp. B	5	oa-p
Delphacidae sp. C	3	oa-p
Delphacidae sp. D	1	oa-p
Auchenorhyncha sp.	1	oa-p

*Auchenorhyncha sp. (nymph)	16	oa-p
Craspedolepta sp.	1	oa-p
Psylloidea sp.	3	oa-p
*Psylloidea sp. (nymph)	1	oa-p
*Aphidoidea sp.	8	u
*Coccoidea sp.	8	u
*Hemiptera sp. (nymph)	1	u
*Trichoptera sp. (case)	3	oa-w
*Lepidoptera sp. (pupa)	3	u
*Diptera sp. (adult)	19	u
*Diptera sp. (larva)	4	u
*Diptera sp. (puparium)	53	u
*Diptera sp. (pupa)	17	u
*Syrphidae sp. (larva)	6	u
*Psychodidae sp.	1	u
*Chironomidae sp. (larva)	1	w
*Bibionidae sp.	7	u
*?Melophagus ovinus (puparium) (Linnaeus)	1	777-
*?Melophagus ovinus (adult) (Linnaeus)	1	u
*Pulex irritans Linnaeus	12	ss
*?Pulex irritans Linnaeus	1	ss
*Siphonaptera sp.	5	u
*?Siphonaptera sp.	2	u
Sphaerius acaroides Waltl	3	u
Cychrus rostratus (Linnaeus)	1	oa
Carabus sp.	1	oa
Notiophilus sp.	2	oa
Elaphrus cupreus Duftschmid	3	oa-d
Elaphrus sp. indet.	2	oa-d
Dyschirius globosus (Herbst)	4	oa
Dyschirius ?globosus (Herbst)	2	oa
Dyschirius sp.	2	oa
Clivina fossor (Linnaeus)	1	oa
Patrobus sp.	1	oa
Trechus ?rivularis (Gyllenhal)	1	oa-d
Trechus ?secalis (Paykull)	1	oa-d
Trechus sp.	2	ob
?Trechus sp.	1	ob
Bembidion sp.	2	oa
Tachys sp.	1	oa
?Tachys sp.	2	oa
Pterostichus diligens (Sturm)	2	oa-d
Pterostichus melanarius (Illiger)	2	ob
Pterostichus ?melanarius (Illiger)	2	ob
Pterostichus nigrita (Paykull)	4	oa-d
Pterostichus ?nigrita (Paykull)	1	oa-d
Pterostichus (Poecilus) sp.	1	oa
Pterostichus sp.	15	ob
?Pterostichus sp.	3	ob
?Calathus sp.	2	oa
Laemostenus terricola (Herbst)	1	ss
Laemostenus ?terricola (Herbst)	1	ss

Agonum sp.	1	oa
Amara sp.	3	oa
?Amara sp.	1	oa
Harpalus rufipes (Degeer)	1	oa
?Harpalus sp.	1	oa
?Bradycellus sp.	1	oa
Carabidae sp.	21	ob
Carabidae sp. A	3	ob
Carabidae sp. B	2	ob
Hydroporinae sp.	1	oa-w
Colymbetinae sp.	3	oa-w
Dytiscidae sp.	1	oa-w
Helophorus ?aquaticus (Linnaeus)	1	oa-w
Helophorus aquaticus or grandis	8	oa-w
Helophorus sp.	15	oa-w
Coelostoma orbiculare (Fabricius)	12	oa-w
Cercyon analis (Paykull)	34	rt-sf
Cercyon ?analis (Paykull)	5	rt-sf
Cercyon atricapillus (Marsham)	4	rf-st
Cercyon ?atricapillus (Marsham)	5	rf-st
Cercyon haemorrhoidalis (Fabricius)	13	rf-sf
Cercyon ?haemorrhoidalis (Fabricius)	4	rf-sf
Cercyon melanocephalus (Linnaeus)	1	rt-sf
Cercyon terminatus (Marsham)	3	rf-st
Cercyon ?terminatus (Marsham)	2	rf-st
Cercyon tristis (Illiger)	5	oa-d
Cercyon ?tristis (Illiger)	3	oa-d
Cercyon convexiusculus group	1	oa-d
Cercyon unipunctatus (Linnaeus)	9	rf-st
Cercyon ustulatus (Preyssler)	4	oa-d
Cercyon sp.	11	u
?Cercyon sp.	1	u
Cercyon sp. A	1	u
Megasternum obscurum (Marsham)	16	rt
Cryptopleurum minutum (Fabricius)	15	rf-st
Hydrobius fuscipes (Linnaeus)	15	oa-w
?Anacaena sp.	1	oa-w
Laccobius sp.	2	oa-w
Enochrus sp.	1	oa-w
Chaetarthria seminulum (Herbst)	13	oa-w
?Chaetarthria seminulum (Herbst)	2	oa-w
Hydrophilinae sp.	1	oa-w
Acritus nigricornis (Hoffmann)	15	rt-st
Histerinae sp.	1	rt
Histeridae sp.	1	u
Ochthebius sp.	4	oa-w
Hydraena sp.	11	oa-w
Ptenidium sp.	23	rt
Ptenidium sp. A	1	rt
Ptenidium sp. B	1	rt
Acrotrichis sp.	14	rt
Acrotrichis sp. A	1	rt
Acrotrichis sp. B	1	rt
Ptiliidae sp.	4	u
*Ptiliidae sp. (pupa)	1	u
Catops sp.	7	u
?Catops sp.	1	u
Catopinae sp.	1	u

Aclypea opaca (Linnaeus)	1	ob-rt
Silphidae sp.	1	u
Scydmaenidae sp.	5	u
Micropeplus fulvus Erichson	1	rt
Micropeplus sp.	1	rt
Megarthrus sp.	2	rt
Proteinus sp.	1	rt
Anthobium sp.	6	oa
Olophrum ?fuscum (Gravenhorst)	1	oa
Olophrum fuscum or piceum	1	oa
Olophrum sp.	4	oa
Acidota crenata (Fabricius)	1	oa
Acidota ?crenata (Fabricius)	1	oa
Acidota sp.	1	oa
Lesteva longoelytrata (Goeze)	2	oa-d
Lesteva sp.	1	oa-d
?Lesteva sp.	1	oa-d
Eusphalerum sp.	3	rt
Pycnoglypta lurida (Gyllenhal)	10	rt
Phyllodrepa salicis (Gyllenhal)	4	rt-sf
Dropephylla ioptera (Stephens)	1	u
Dropephylla sp.	1	u
?Dropephylla sp.	1	u
Omalium excavatum Stephens	3	rt-sf
Omalium ?excavatum Stephens	1	rt-sf
Omalium sp.	4	rt
Xylodromus concinnus (Marsham)	9	rt-st
Xylodromus ?concinnus (Marsham)	12	rt-st
?Xylodromus concinnus (Marsham)	8	rt-st
Omaliinae sp.	5	rt
Omaliinae sp. B	1	u
Coprophilus striatulus (Fabricius)	3	rt-st
Carpelimus bilineatus Stephens	10	rt-sf
Carpelimus ?bilineatus Stephens	13	rt-sf
Carpelimus elongatulus (Erichson)	1	oa-d
Carpelimus ?gracilis (Mannerheim)	1	u
Carpelimus pusillus (Gravenhorst)	1	rt-sf
Carpelimus rivularis (Motschulsky)	1	ob-d
Carpelimus ?rivularis (Motschulsky)	4	ob-d
Carpelimus bilineatus or rivularis	5	u
Carpelimus sp.	15	u
Carpelimus sp. B	3	u
Platystethus arenarius (Fourcroy)	31	rf
Platystethus cornutus group	8	oa-d
Platystethus ?nitens (Sahlberg)	1	oa-d
Anotylus nitidulus (Gravenhorst)	19	rt
Anotylus rugosus (Fabricius)	26	rt
Anotylus ?tetracarinatus (Block)	1	rt
Oxytelus sculptus Gravenhorst	23	rt-st
Oxytelinae sp.	1	u
Stenus sp.	27	u
Stenus sp. A	12	u
Stenus sp. B	12	u
Stenus sp. C	2	u
Euaesthetus bipunctatus (Ljungh)	1	oa
Lathrobium sp.	6	u
Lathrobium sp. A	1	u
Lathrobium sp. B	1	u

Ochthephilum sp.	1	oa-d
Medon sp.	1	u
Lithocharis ochracea (Gravenhorst)	1	rt-st
?Lithocharis sp.	1	rt
Rugilus orbiculatus (Paykull)	3	rt-sf
Rugilus ?orbiculatus (Paykull)	2	rt-sf
Rugilus sp.	5	rt
Paederinae sp.	1	u
Othius myrmecophilus Kiesenwetter	1	rt
Othius sp.	6	rt
?Othius sp.	2	rt
Leptacinus ?intermedius Donisthorpe	1	rt-st
Leptacinus pusillus (Stephens)	1	rt-st
Leptacinus ?pusillus (Stephens)	2	rt-st
Leptacinus sp.	11	rt-st
?Leptacinus sp.	1	rt-st
Gyrohypnus angustatus Stephens	1	rt-st
Gyrohypnus ?angustatus Stephens	10	rt-st
Gyrohypnus fracticornis (Muller)	21	rt-st
Gyrohypnus ?fracticornis (Muller)	3	rt-st
Gyrohypnus sp.	3	rt
?Gyrohypnus sp.	1	rt
Xantholinus linearis (Olivier)	2	rt-sf
Xantholinus longiventris Heer	1	rt-sf
Xantholinus sp.	5	u
Xantholininae sp.	1	u
Neobisnius sp.	4	u
?Neobisnius sp.	3	u
Philonthus sp.	12	u
Philonthus sp. A	26	u
Philonthus sp. B	25	u
Philonthus sp. C	10	u
Philonthus sp. D	4	u
Philonthus or Gabrius sp.	3	u
Staphylinus sp.	1	u
Creophilus maxillosus (Linnaeus)	1	rt
Quedius cinctus (Paykull)	5	rt
Quedius sp.	8	u
Quedius sp. A	1	u
Quedius sp. B	1	u
Philonthus or Quedius sp.	1	u
Staphylininae sp.	14	u
Staphylininae sp. A	3	u
Staphylininae sp. B	3	u
Staphylininae sp. C	1	u
Sepedophilus sp.	1	u
Tachyporus obtusus (Linnaeus)	1	u
Tachyporus sp.	5	u
Tachinus laticollis or marginellus	1	u
Tachinus signatus Gravenhorst	1	u
Tachinus ?signatus Gravenhorst	1	u
Tachinus sp.	2	u
Cordalia obscura (Gravenhorst)	16	rt-sf
Falagria caesa or sulcatula	3	rt-sf
Falagria sp.	12	rt-sf
Falagria or Cordalia sp.	8	rt-sf
Crataraea suturalis (Mannerheim)	4	rt-st
?Crataraea suturalis (Mannerheim)	3	rt-st

Aleochara sp.	2	u
Aleocharinae sp.	13	u
Aleocharinae sp. A	34	u
Aleocharinae sp. B	34	u
Aleocharinae sp. C	17	u
Aleocharinae sp. D	11	u
Aleocharinae sp. E	8	u
Aleocharinae sp. F	6	u
Aleocharinae sp. G	2	u
Aleocharinae sp. H	1	u
Staphylinidae sp.	1	u
Pselaphidae sp.	11	u
?Pselaphidae sp.	1	u
Sinodendron cylindricum (Linnaeus)	1	l
?Sinodendron cylindricum (Linnaeus)	1	l
Trox scaber (Linnaeus)	12	rt-sf
Trox ?scaber (Linnaeus)	1	rt-sf
*Trox scaber (larva) (Linnaeus)	3	rt-sf
Geotrupes sp.	27	oa-rf
?Geotrupes sp.	1	oa-rf
Aphodius ?contaminatus (Herbst)	2	oa-rf
Aphodius ?fimetarius (Linnaeus)	1	oa-rf
Aphodius prodromus (Brahm)	4	ob-rf
Aphodius ?prodromus (Brahm)	3	ob-rf
Aphodius villosus Gyllenhal	2	oa-p
Aphodius sp.	23	ob-rf
Aphodius sp. A	15	ob-rf
Aphodius sp. B	14	ob-rf
Aphodius sp. C	1	ob-rf
Melolontha sp.	2	oa-p
?Melolontha sp.	1	oa-p
Phyllopertha horticola (Linnaeus)	39	oa-p
?Phyllopertha horticola (Linnaeus)	3	oa-p
?Cetonia sp.	1	oa
Melolonthinae/Rutelinae/Cetoninae sp.	1	oa-p
?Melolonthinae/Rutelinae/Cetoninae sp.	1	oa-p
Clambus pubescens Redtenbacher	2	rt-sf
Clambus ?pubescens Redtenbacher	1	rt-sf
Clambus sp.	10	rt-sf
Cyphon padi (Linnaeus)	4	oa-d
Cyphon sp.	3	oa-d
Scirtidae sp.	1	oa-d
Simplocaria ?semistriata (Fabricius)	4	oa-p
Simplocaria sp.	1	oa-p
Byrrhidae sp.	1	oa-p
Dryops sp.	1	oa-d
*?Lacon quercus (larva) (Herbst)	1	oa
*Melanotus erythropus (larva) (Gmelin)	1	l
*?Actenicerus sjaelandicus (larva) (Muller)	1	001L
*?Denticollis linearis (larva) (Linnaeus)	1	u
Elateridae sp.	8	ob
Elateridae sp. B	1	ob
*Elateridae sp. (larva)	6	ob
*Elateridae sp. A (larva)	1	ob
*Elateridae sp. B (larva)	1	ob
*Elateridae sp. C (larva)	1	ob
Cantharidae sp.	2	ob
?Cantharidae sp.	1	ob

Dermestes sp.	1	rt-sf
Dermestidae sp.	3	rt-sf
?Dermestidae sp.	1	rt-sf
Anobium ?punctatum (Degeer)	1	l-sf
?Ptilinus pectinicornis (Linnaeus)	1	l-sf
Ptinus ?fur (Linnaeus)	2	rd-sf
Ptinus raptor Sturm	10	rd-sf
Ptinus ?raptor Sturm	2	rd-sf
Ptinus sp.	17	rd-sf
Lyctus linearis (Goeze)	14	l-sf
Necrobia violacea (Linnaeus)	1	rt-sf
?Kateretes sp.	1	oa-p-d
Brachypterus sp.	5	oa-p
Meligethes sp.	1	oa-p
Epuraea sp.	1	u
Omosita colon (Linnaeus)	1	rt-sf
Omosita sp.	2	rt-sf
?Omosita sp.	4	rt-sf
Rhizophagus ?bipustulatus (Fabricius)	2	l
Rhizophagus parallelocollis Gyllenhal	2	rt-sf
Rhizophagus sp.	7	u
Monotoma picipes Herbst	2	rt-st
Monotoma sp.	7	rt-sf
Cryptophagus scutellatus Newman	2	rd-st
Cryptophagus ?scutellatus Newman	1	rd-st
Cryptophagus sp.	30	rd-sf
?Cryptophagus sp.	2	rd-sf
Cryptophagus sp. A	13	rd-sf
Cryptophagus sp. B	12	rd-sf
Cryptophagus sp. C	4	rd-sf
Cryptophagus sp. D	1	rd-sf
Atomaria sp.	25	rd
Atomaria sp. A	8	rd
Atomaria sp. B	8	rd
Atomaria sp. C	2	rd
Atomaria sp. D	1	rd
Ephistemus globulus (Paykull)	20	rd-sf
?Ephistemus globulus (Paykull)	6	rd-sf
Olibrus aeneus (Fabricius)	1	oa-p
Cerylon ferrugineum Stephens	4	l
Cerylon ?ferrugineum Stephens	1	l
Cerylon sp.	1	l
Orthoperus sp.	18	rt
Orthoperus sp. A	2	rt
Orthoperus sp. B	2	rt
Adalia ?decimpunctata (Linnaeus)	1	oa-p
Coccinellidae sp.	1	oa-p
Lathridius minutus group	44	rd-st
Enicmus sp.	6	rt-sf
?Enicmus sp.	1	rt-sf
Corticaria elongata (Gyllenhal)	2	rt-sf
Corticaria sp.	19	rt-sf
Corticaria sp. A	18	rt-sf
Corticaria sp. B	18	rt-sf
Corticaria sp. C	6	rt-sf
Corticarina sp.	2	rt
Cortinicara gibbosa (Herbst)	2	rt
Corticarina or Cortinicara sp.	9	rt

Cisidae sp.	1	l
Litargus connexus (Fourcroy)	1	u
Typhaea stercorea (Linnaeus)	1	rd-ss
Aglenus brunneus (Gyllenhal)	2	rt-ss
Salpingus sp.	1	l
Rhinosimus ruficollis (Linnaeus)	1	l
Rhinosimus sp.	1	l
Orchesia undulata Kraatz	1	l
Anaspis sp.	1	ob
Anthicus floralis or formicarius	4	rt-st
?Anthicus sp.	1	rt
Rhagium bifasciatum Fabricius	1	oa-p
Phymatodes testaceus (Linnaeus)	10	l
Cerambycidae sp.	1	l
?Cerambycidae sp.	3	l
Bruchus rufimanus Boheman	1	st
Bruchidae sp.	3	u
Plateumaris affinis (Kunze)	1	oa-d-p
Plateumaris ?affinis (Kunze)	1	oa-d-p
Plateumaris sp.	8	oa-d-p
?Plateumaris sp.	2	oa-d-p
Donaciinae sp.	7	oa-d-p
Lema or Oulema sp.	1	oa-p
Chrysolina ?fastuosa (Scopoli)	1	oa-p
Chrysolina sp.	1	oa-p
Phaedon ?armoraciae (Linnaeus)	1	oa-p
Phaedon ?cochlaeriae (Fabricius)	1	oa-p
Phaedon sp.	2	oa-p
?Phaedon sp.	1	oa-p
Prasocuris phellandrii (Linnaeus)	3	oa-p-d
Chrysomelinae sp.	13	oa-p
Galerucella sp.	2	oa-p
?Galerucella sp.	1	oa-p
Phyllotreta sp.	1	oa-p
Longitarsus sp.	1	oa-p
?Longitarsus sp.	1	oa-p
Altica sp.	1	oa-p
?Altica sp.	1	oa-p
Chaetocnema arida group	6	oa-p
Chaetocnema concinna (Marsham)	1	oa-p
Chaetocnema ?concinna (Marsham)	1	oa-p
Chaetocnema sp.	2	oa-p
Psylliodes sp.	2	oa-p
Halticinae sp.	6	oa-p
Brachytarsus ?nebulosus (Forster)	1	oa
Apion (Oxystoma) cerdo Gerstaecker	1	oa-p
Apion (Oxystoma) pomonae (Fabricius)	1	oa-p
Apion (Oxystoma) sp.	4	oa-p
Apion sp.	19	oa-p
Apion sp. A	10	oa-p
Apion sp. B	10	oa-p
Otiorhynchus porcatus (Herbst)	1	oa-p
Phyllobius sp.	1	oa-p
Phyllobius or Polydrusus sp.	1	oa-p
Strophosomus sp.	3	oa-p
?Strophosomus sp.	3	oa-p
Sitona lepidus Gyllenhal	1	oa-p
Sitona ?lepidus Gyllenhal	1	oa-p

Sitona ?suturalis Stephens	1	oa-p
Sitona sp.	3	oa-p
?Sitona sp.	2	oa-p
Hypera sp.	8	oa-p
Magdalis sp.	1	oa-p
?Thryogenes sp.	1	oa-p
Micrelus ericae (Gyllenhal)	1	oa-p-m
Ceutorhynchus sp.	6	oa-p
?Rhinoncus sp.	1	oa-p
Phytobius sp.	2	oa-d
?Phytobius sp.	2	oa-d
Ceuthorhynchinae sp.	6	oa-p
Ceuthorhynchinae sp. A	1	oa-p
Ceuthorhynchinae sp. B	1	oa-p
Limnobaris pilistriata (Fabricius)	3	oa
Limnobaris ?pilistriata (Stephens)	3	oa-p-d
?Limnobaris sp.	3	oa-p-d
Anthonomus sp.	2	oa-p
Gymnetron ?antirrhini (Paykull)	1	oa-p
Gymnetron labile (Herbst)	5	oa-p
Gymnetron sp.	2	oa-p
?Gymnetron sp.	6	oa-p
Rhynchaenus quercus (Linnaeus)	1	oa-p
Rhynchaenus ?quercus (Linnaeus)	2	oa-p
Rhynchaenus sp.	5	oa-p
Curculionidae sp.	19	oa
?Curculionidae sp.	1	oa
Curculionidae sp. A	4	oa
Curculionidae sp. B	4	oa
Curculionidae sp. C	1	oa
Scolytus rugulosus (Muller)	6	l
Scolytus ?rugulosus (Muller)	1	l
Scolytus sp.	2	l
Dryocoetinus ?villosus (Fabricius)	1	l
Taphrorychus bicolor (Herbst)	1	l
Xyloterus domesticus (Linnaeus)	1	l
Scolytidae sp.	3	l
Coleoptera sp.	9	u
Coleoptera sp. A	3	u
Coleoptera sp. B	4	u
Coleoptera sp. C	2	u
*Coleoptera sp. (larva)	39	u
*Proctotrupoidea sp.	17	u
*Hymenoptera sp.	12	u
*Hymenoptera Parasitica sp.	17	u
*Formicidae sp.	20	u
*Chalcidoidea sp.	20	u
*Apoidea sp.	3	u
*Apis mellifera Linnaeus	3	u
*?Apis mellifera Linnaeus	8	u
*Chalcidoidea sp. A	1	u
*Chalcidoidea sp. B	1	u
*Insecta sp. (larva)	3	u
*Insecta sp. (pupa)	1	u
*Insecta sp.	1	u
*Insecta sp. (immature)	2	u
*Aranae sp.	25	u
*Acarina sp.	52	u

*Insecta sp. (larval case)	2	u

Table 2. Abbreviations for ecological codes and statistics used for interpretation of insect remains in text and tables. Lower case codes in parentheses are those assigned to taxa and used to calculate the group values (the codes in capitals). See Table 1 for codes assigned to taxa from the Viborg Søndersø site. Indivs - individuals (based on MNI); No - number.

No taxa	S	Percentage of RT taxa	PSRT
Estimated number of indivs (MNI)	N	No RT indivs	NRT
Index of diversity (α)	alpha	Percentage of RT indivs	PNRT
Standard error of alpha	SE alpha	Index of diversity of RT component	alpha RT
No 'certain' outdoor taxa (oa)	SOA	Standard error	SEalphaRT
Percentage of 'certain' outdoor taxa	PSOA	No 'dry' decomposer taxa (rd)	SRD
No 'certain' outdoor indivs	NOA	Percentage of RD taxa	PSRD
Percentage of 'certain' outdoor indivs	PNOA	No RD indivs	NRD
No OA and probable outdoor taxa (oa + ob)	SOB	Percentage of RD indivs	PNRD
Percentage of OB taxa	PSOB	Index of diversity of the RD component	alphaRD
No OB indivs	NOB	Standard error	SEalphaRD
Percentage OB indivs	PNOB	No 'foul' decomposer taxa (rf)	SRF
Index of diversity of the OB component	alphaOB	Percentage of RF taxa	PSRF
Standard error	SEalphaOB	No RF indivs	NRF
No aquatic taxa (w)	SW	Percentage of RF indivs	PNRF
Percentage of aquatic taxa	PSW	Index of diversity of the RF component	alphaRF
No aquatic indivs	NW	Standard error	SEalphaRF
Percentage of W indivs	PNW	No synanthropic taxa (sf + st + ss)	SSA
Index of diversity of the W component	alphaW	Percentage of synanthropic taxa	PSSA
Standard error	SEalphaW	No synanthropic indivs	NSA
No damp ground/waterside taxa (d)	SD	Percentage of SA indivs	PNSA
Percentage D taxa	PSD	Index of diversity of SA component	ALPHASA
No damp D indivs	ND	Standard error	SEALPHASA
Percentage of D indivs	PND	No facultatively synanthropic taxa	SSF
Index of diversity of the D component	alphaD	Percentage of SF taxa	PSSF
Standard error	SEalphaD	No SF indivs	NSF
No strongly plant-associated taxa (p)	SP	Percentage of SF indivs	PNSF
Percentage of P taxa	PSP	Index of diversity of SF component	ALPHASF
No strongly P indivs	NP	Standard error	SEALPHASF
Percentage of P indivs	PNP	No typical synanthropic taxa	SST
Index of diversity of the P component	alphaP	Percentage of ST taxa	PSST
Standard error	SEalphaP	No ST indivs	NST
No heathland/moorland taxa (m)	SM	Percentage of ST indivs	PNST
Percentage of M taxa	PSM	Index of diversity of ST component	ALPHAST
No M indivs	NM	Standard error	SEALPHAST
Percentage of M indivs	PNM	No strongly synanthropic taxa	SSS
Index of diversity of the M component	alphaM	Percentage of SS taxa	PSSS
Standard error	SEalphaM	No SS indivs	NSS
No wood-associated taxa (l)	SL	Percentage of SS indivs	PNSS
Percentage of L taxa	PSL	Index of diversity of SS component	ALPHASS
No L indivs	NL	Standard error	SEALPHASS
Percentage of L indivs	PNL	No uncoded taxa (u)	SU
Index of diversity of the L component	alphaL	Percentage of uncoded indivs	PNU
Standard error	SEalphaL	No indivs of grain pests (g)	NG
No decomposer taxa (rt + rd + rf)	SRT	Percentage of indivs of grain pests	PNG

Table 3. Values of selected main statistics for the assemblages of adult beetles and bugs from the Viborg Søndersø site: (1) means of sample assemblage values and (b) whole site values (see text). See Table 2 for explanation of codes.

Parameter	Mean of assemblage percentages	Whole site percentages
PNOB	33	25
PNW	5	4
PND	4	4
PNP	14	11
PNM	0	0
PNL	2	2
PNRT	49	57
PNRD	15	18
PNRF	7	7
PNSA	33	41
PNSF	21	26
PNST	13	15
PNSS	0	0
PNG	0	0

Table 4. Summary of modes of preservation records for sample assemblages from from the Viborg Søndersø site. See text for explanation of scales.

	Number of cases	
Degree	Erosion	Fragmentation
No record	8	7
1.5	1	0
2.0	21	10
2.5	19	35
3.0	8	4
3.5	1	1
4.0	1	1

Table 5.Insects coded as synanthropes from the Viborg Søndersø site. Key: ec - ecological codes. For explanation of codes see text and Table 2.

Taxon	ec	no contexts	no samples	total individuals
*Pediculus humanus	ss	4	4	6
Lyctocoris campestris	rd-st	1	1	1
*Pulex irritans	ss	9?1	12?1	23?1
Laemostenus terricola	ss	1?1	1?1	1?1
Cercyon analis	rt-sf	24?5	34?5	211?7
Cercyon atricapillus	rf-st	4?2	4?5	5?6
Cercyon haemorrhoidalis	rf-sf	9?4	13?4	15?4
Cercyon melanocephalus	rt-sf	1	1	1
Cercyon terminatus	rf-st	3?2	3?2	6?2
Cercyon unipunctatus	rf-st	7	9	12
Cryptopleurum minutum	rf-st	13	15	17
Acritus nigricornis	rt-st	10	15	22
Phyllodrepa salicis	rt-sf	4	4	4
Omalium excavatum	rt-sf	3?1	3?1	3?1
Xylodromus concinnus	rt-st	8?18	9?20	21?31
Coprophilus striatulus	rt-st	2	3	3
Carpelimus bilineatus	rt-sf	9?9	10?13	45?19
Carpelimus pusillus	rt-sf	1	1	15
Oxytelus sculptus	rt-st	17	23	36
Lithocharis ochracea	rt-st	1	1	1
Rugilus orbiculatus	rt-sf	3?2	3?2	3?2
Leptacinus ?intermedius	rt-st	1	1	1
Leptacinus pusillus	rt-st	1?2	1?2	2?2
Leptacinus sp.	rt-st	9?1	11?1	13?1
Gyrohypnus angustatus	rt-st	1?10	1?10	6?11
Gyrohypnus fracticornis	rt-st	15?3	21?3	57?4
Xantholinus linearis	rt-sf	2	2	3

Xantholinus longiventris	rt-sf	1	1	1
Cordalia obscura	rt-sf	13	16	44
Falagria caesa or sulcatula	rt-sf	3	3	6
Falagria sp.	rt-sf	10	12	15
Falagria or Cordalia sp.	rt-sf	8	8	8
Crataraea suturalis	rt-st	4?3	4?3	5?3
Trox scaber	rt-sf	7?1	12?1	31?1
*Trox scaber (larva)	rt-sf	2	3	18
Clambus pubescens	rt-sf	2?1	2?1	3?1
Clambus sp.	rt-sf	7	10	10
Dermestes sp.	rt-sf	1	1	1
Dermestidae sp.	rt-sf	2?1	3?1	3?1
Anobium ?punctatum	l-sf	1	1	1
?Ptilinus pectinicornis	l-sf	1	1	1
Ptinus ?fur	rd-sf	2	2	3
Ptinus raptor	rd-sf	9?2	10?2	22?3
Ptinus sp.	rd-sf	12	17	22
Lyctus linearis	l-sf	13	14	18
Necrobia violacea	rt-sf	1	1	1
Omosita colon	rt-sf	1	1	1
Omosita sp.	rt-sf	2?4	2?4	2?4
Rhizophagus parallelocollis	rt-sf	2	2	2
Monotoma picipes	rt-st	2	2	2
Monotoma sp.	rt-sf	6	7	8
Cryptophagus scutellatus	rd-st	2?1	2?1	2?3
?Cryptophagus sp.	rd-sf	2	2	2
Cryptophagus sp.	rd-sf	26	30	59
Cryptophagus sp. A	rd-sf	11	13	33
Cryptophagus sp. B	rd-sf	10	12	35
Cryptophagus sp. C	rd-sf	4	4	16
Cryptophagus sp. D	rd-sf	1	1	2

Ephistemus globulus	rd-sf	15?6	20?6	48?7
Lathridius minutus group	rd-st	31	44	236
Enicmus sp.	rt-sf	5?1	6?1	8?1
Corticaria elongata	rt-sf	2	2	2
Corticaria sp.	rt-sf	18	19	22
Corticaria sp. A	rt-sf	13	18	27
Corticaria sp. B	rt-sf	13	18	43
Corticaria sp. C	rt-sf	5	6	12
Typhaea stercorea	rd-ss	1	1	1
Aglenus brunneus	rt-ss	2	2	4
Anthicus floralis or formicarius	rt-st	2	4	4
Bruchus rufimanus	st	1	1	1

Table 6. Percentages of categories of synanthropic fauna in the amalgamated assemblages from the Viborg Søndersø site and some other sites. SA - all synanthropes; SF - facultative synanthropes; ST - species which are typically synanthropic; SS - strong synanthropes.

Property	Viborg	Coppergate	DPF	Buiston
% SA	33	55	54	36
% SF	21	24	9	26
% ST	13	24	12	10
% SS	0	7	33	0

Table 7. Internal structure of the synanthropic fauna in the amalgamated assemblages from the Viborg Søndersø site and some other sites. SA - all synanthropes; SF - facultative synanthropes; ST - species which are typically synanthropic; SS - strong synanthropes. Data for Deer Park Farms are strongly skewed by the abundant Aglenus brunneus*: see Table 8.*

Property	Viborg	Coppergate	DPF	Buiston
SF as % SA	62	44	18	71
ST as % SA	37	43	21	29
SS as % SA	0	14	61	1

Table 8. Internal structure of the synanthropic fauna in the amalgamated assemblages from the Viborg Søndersø site and some other sites, after removal of Aglenus brunneus*. SA - all synanthropes; SF - facultative synanthropes; ST - species which are typically synanthropic; SS - strong synanthropes.*

Property	Viborg	Coppergate	DPF	Buiston
SF as % SA	62	48	44	71

ST as % SA	37	47	53	29
SS as % SA	0	5	3	1

Table 9. Proportions of synanthropes within decomposer component in the amalgamated assemblages from the Viborg Søndersø site and some other sites, after removal of Aglenus brunneus. *SA - all synanthropes; SF - facultative synanthropes; ST - species which are typically synanthropic; SS - strong synanthropes.*

Property	Viborg	Coppergate	DPF	Buiston
SA as % RT	72	82	60	71
SF as % RT	45	39	26	50
ST as % RT	27	38	32	20
SS as % RT	0	4	2	0

Table 10. Records of honey bees, Apis mellifera, *from the Viborg Søndersø site*

Context	Sample	ext		Recorded as	n
188	188	/T		?Apis mellifera	1
218	1813	/1	1813h	?Apis mellifera	1
301	301	/T		?Apis mellifera	1
301	2385	/1	2385c	Apis mellifera	2
303	2362	/1	2362c	Apis mellifera	2
304	2406	/1		Apis mellifera	1
305	2404	/1	2404c	?Apis mellifera	1
306	306	/T		?Apis mellifera	1
426	3008	/1	3008h	?Apis mellifera	1
480	3184	/1	3184h	?Apis mellifera	1
532	532	/T		?Apis mellifera	1

Table 11. Records of Trox scaber *from Context 218 at the Viborg Søndersø site.*

Sample	Extension	Subsample	Life stage	n
1813	/1	1813h	Adult	5
1835	/1	1835h	Larva	1
1835	/1	1835h	Adult	2
1835	/T	1835c	Larva	15
1835	/T	1835c	Adult	8
1881	/1	1881w	Adult	1
2016	/1	2016f/I	Adult	1
2017	/1	2017/I	Adult	1
2385	/1	2385c	Larva	2

Table 12. Records of the longhorn beetle Phymatodes testaceus *from the Viborg Søndersø site.*

Context	Sample	Extension	Subsample	n
165	1913	/1		1
218	1813	/1	1813h	1
218	1835	/T	1835c	1
218	1881	/1	1881w	2
257	1994	/1	1994c	1
301	2385	/1	2385c	2
303	2362	/1	2362c	2
304	2406	/1		1
305	2404	/1	2404c	3
480	3184	/1	3184h	3

Table 13. Records of beetles associated with dead and decaying wood from the Viborg Søndersø site.

Taxon	no recs	no inds
Sinodendron cylindricum	1?1	1?1
*Melanotus erythropus (larva)	1	1
Anobium ?punctatum	1	1
?Ptilinus pectinicornis	1	1
Lyctus linearis	14	18
Rhizophagus ?bipustulatus	2	2
Cerylon ferrugineum	4?2	5?2
Cisidae sp.	1	1
Salpingus sp.	1	1
Rhinosimus ruficollis	1?1	1?1
Orchesia undulata	1	1
Phymatodes testaceus	10	17
Cerambycidae sp.	1?3	1?3
Scolytus rugulosus	6?1	7?1
Scolytus sp.(probably above)	2	2
Dryocoetinus ?villosus	1	1
Taphrorychus bicolor	1	1
Xyloterus domesticus	1	1
Scolytidae sp.	3	4

Appendix 1. Species lists in rank order for invertebrate macrofossils from samples from the Viborg Søndersø site. For each sample assemblage the adult Hemiptera (bugs) and Coleoptera (beetles) are listed first, followed by the remaining invertebrates. Headers: weight is in kilogrammes; E - erosion; F - fragmentation (following Kenward and Large 1998, see text); ec - ecological codes; n = minimum number of individuals; SQ = semi-quantitative (e = estimate; - = fully quantitative, m = 'many', translated as 15 individuals; s = several, translated as 6). For translation of ecological codes, see Table 2. Note: it has not been practical to italicise specific epithets in this table.
Appendix 1. Species lists in rank order for invertebrate macrofossils from samples from the Viborg Søndersø site. For each sample assemblage the adult Hemiptera (bugs) and Coleoptera (beetles) are listed first, followed by the remaining invertebrates. Headers: weight is in kilogrammes; E - erosion; F - fragmentation (following Kenward and Large 1998, see text); ec - ecological codes; n = minimum number of individuals; SQ = semi-quantitative (e = estimate; - = fully quantitative, m = 'many', translated as 15 individuals; s = several, translated as 6). For translation of ecological codes, see Table 2. Note: it has not been practical to italicise specific epithets in this table.

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Context: 165 Sample: 1739/1 CA: 1739c ReM: RS
Weight: 3.00 E: 2.00 F: 2.00

Notes: Entered HK 3/9/03. Flot 2.5 cm in small pot, wood fragments and herbaceous detritus. Rather few beetles, probably no special character beyond rather foul. Not worth time needed to sort to recover these insects. P3, NFA.

Pterostichus sp.	1	-	ob
Cercyon ?analis	1	-	rt-sf
Cercyon haemorrhoidalis	1	-	rf-sf
Cercyon sp. A	1	-	u
Megasternum obscurum	1	-	rt
Anthobium sp.	1	-	oa
Platystethus arenarius	1	-	rf
Philonthus sp.	1	-	u
Staphylininae sp.	1	-	u
Aleocharinae sp.	1	-	u
Aphodius sp.	1	-	ob-rf
Phyllopertha horticola	1	-	oa-p
Cryptophagus sp.	1	-	rd-sf
Atomaria sp.	1	-	rd
Coccinellidae sp.	1	-	oa-p
Chrysomelinae sp.	1	-	oa-p
Apion sp.	1	-	oa-p
*Diptera sp. (puparium)	15	m	u
*Acarina sp.	6	s	u
*Coleoptera sp. (larva)	1	-	u

Context: 165 Sample: 1913/1 ReM: D
Weight: 1.00 E: 2.50 F: 2.50

Notes: Entered HK 21/8/03. Flot 2 dish, mainly fine plant fragments, but insect fragments abundant. Recorded in flot and on filter paper. Some very good preservation, but some others very less good (E1.5-4.0, mode 2.5 weak, possibly bimodal; F 1.0-4.0, mode 2.5 weak). Descriptions of beetle larvae on listing sheet. See some other notes on sheet when writing.

Cercyon analis	11	-	rt-sf
Lathridius minutus group	7	-	rd-st
Gyrohypnus fracticornis	6	-	rt-st
Cryptophagus sp. B	5	-	rd-sf
Carpelimus bilineatus	4	-	rt-sf
Atomaria sp.	4	-	rd
Ptenidium sp.	3	-	rt
Acrotrichis sp.	3	-	rt
Philonthus sp. A	3	-	u
Ephistemus globulus	3	-	rd-sf
Cercyon atricapillus	2	-	rf-st
Xylodromus ?concinnus	2	-	rt-st
Platystethus arenarius	2	-	rf
Anotylus rugosus	2	-	rt
Stenus sp. A	2	-	u
Philonthus sp. B	2	-	u
Cordalia obscura	2	-	rt-sf
Aleocharinae sp. C	2	-	u
Ptinus ?fur	2	-	rd-sf
Cryptophagus sp. A	2	-	rd-sf

Orthoperus sp.	2	-	rt
Corticaria sp.	2	-	rt-sf
Scolytidae sp.	2	-	l
Delphacidae sp.	1	-	oa-p
Dyschirius globosus	1	-	oa
Carabidae sp.	1	-	ob
Coelostoma orbiculare	1	-	oa-w
Cercyon haemorrhoidalis	1	-	rf-sf
Cercyon tristis	1	-	oa-d
Cercyon unipunctatus	1	-	rf-st
Cryptopleurum minutum	1	-	rf-st
Hydrobius fuscipes	1	-	oa-w
Pycnoglypta lurida	1	-	rt
Carpelimus sp.	1	-	u
Stenus sp. B	1	-	u
Stenus sp. C	1	-	u
Leptacinus sp.	1	-	rt-st
Gyrohypnus ?angustatus	1	-	rt-st
Philonthus sp. C	1	-	u
Philonthus sp. D	1	-	u
Quedius cinctus	1	-	rt
Philonthus or Quedius sp.	1	-	u
Falagria sp.	1	-	rt-sf
Aleocharinae sp. A	1	-	u
Aleocharinae sp. B	1	-	u
Aleocharinae sp. D	1	-	u
Aleocharinae sp. E	1	-	u
Aleocharinae sp. F	1	-	u
Geotrupes sp.	1	-	oa-rf
Aphodius prodromus	1	-	ob-rf
Aphodius sp. A	1	-	ob-rf
Aphodius sp. B	1	-	ob-rf
Phyllopertha horticola	1	-	oa-p
Clambus sp.	1	-	rt-sf
Ptinus raptor	1	-	rd-sf
Lyctus linearis	1	-	l-sf
Rhizophagus sp.	1	-	u
Enicmus sp.	1	-	rt-sf
Rhinosimus sp.	1	-	l
Phymatodes testaceus	1	-	l
Prasocuris phellandrii	1	-	oa-p-d
Chrysomelinae sp.	1	-	oa-p
Apion sp.	1	-	oa-p
?Strophosomus sp.	1	-	oa-p
Anthonomus sp.	1	-	oa-p
Rhynchaenus sp.	1	-	oa-p
*Damalinia ovis	40	e	u
*Acarina sp.	16	m	u
*Diptera sp. (adult)	15	m	u
*Diptera sp. (puparium)	15	m	u
*Coleoptera sp. (larva)	6	s	u
*Hymenoptera sp.	6	s	u
*Proctotrupoidea sp.	6	s	u
*Pediculus humanus	2	-	ss
*Aranae sp.	2	-	u
*Oligochaeta sp. (egg capsule)	1	-	u
*Haematopinus ?apri	1	-	u
*Heteroptera sp. (nymph)	1	-	u
*Coccoidea sp.	1	-	u
*Psychodidae sp.	1	-	u
*Syrphidae sp. (larva)	1	-	u
*Apoidea sp.	1	-	u
*Chalcidoidea sp.	1	-	u
*Hymenoptera Parasitica sp.	1	-	u

Context: 166 Sample: 1502/1 CA: 1502C ReM: RS
Weight: 3.00 E: 2.00 F: 2.00

Notes: Entered HK 3/9/03. Flot 1.5 cm in small jar, mostly woody detritus. Modest-sized group of remains, fairly slow to sort but quick to record. No special character. P2.

Cercyon analis	2	-	rt-sf
Helophorus aquaticus or grandis	1	-	oa-w
Helophorus sp.	1	-	oa-w
Cercyon atricapillus	1	-	rf-st
Cercyon haemorrhoidalis	1	-	rf-sf
Cercyon sp.	1	-	u
Megasternum obscurum	1	-	rt
Cryptopleurum minutum	1	-	rf-st
Ochthebius sp.	1	-	oa-w
Acrotrichis sp.	1	-	rt
Olophrum sp.	1	-	oa
?Xylodromus concinnus	1	-	rt-st
Platystethus arenarius	1	-	rf
Anotylus rugosus	1	-	rt
Lathrobium sp.	1	-	u
Gyrohypnus ?angustatus	1	-	rt-st
Philonthus sp.	1	-	u
Falagria sp.	1	-	rt-sf
Trox scaber	1	-	rt-sf
Geotrupes sp.	1	-	oa-rf
Aphodius sp.	1	-	ob-rf
Phyllopertha horticola	1	-	oa-p
Epuraea sp.	1	-	u
Cryptophagus sp.	1	-	rd-sf
Ephistemus globulus	1	-	rd-sf
Lathridius minutus group	1	-	rd-st
Corticaria sp.	1	-	rt-sf
Corticarina or Cortinicara sp.	1	-	rt
Aglenus brunneus	1	-	rt-ss
Apion sp.	1	-	oa-p
?Rhinoncus sp.	1	-	oa-p
*Diptera sp. (puparium)	15	m	u
*Acarina sp.	6	s	u
*?Siphonaptera sp.	1	-	u

Context: 185 Sample: 1563/1 ReM: D
Weight: 0.55 E: 2.50 F: 3.00

Notes: Entered HK 21/8/03. Flot one dish, plant fibres and bark fragments. Recorded in flot and on

filter paper. Variable preservation: E 1.5-4.0, mode 2.5 weak; F 2.5-5.0, mode 3.0 weak. Unexpanded Apion elytron.

Lathridius minutus group	3	-	rd-st
Platystethus arenarius	2	-	rf
Xantholinus sp.	2	-	u
Philonthus sp. B	2	-	u
Falagria caesa or sulcatula	2	-	rt-sf
Aleocharinae sp. A	2	-	u
Ptinus sp.	2	-	rd-sf
Cryptophagus sp.	2	-	rd-sf
Atomaria sp. A	2	-	rd
Atomaria sp. B	2	-	rd
Coelostoma orbiculare	1	-	oa-w
Cercyon unipunctatus	1	-	rf-st
Xylodromus ?concinnus	1	-	rt-st
Carpelimus bilineatus	1	-	rt-sf
Carpelimus ?rivularis	1	-	ob-d
Anotylus ?tetracarinatus	1	-	rt
Oxytelus sculptus	1	-	rt-st
Stenus sp.	1	-	u
Gyrohypnus ?angustatus	1	-	rt-st
Philonthus sp. A	1	-	u
Cordalia obscura	1	-	rt-sf
Aleochara sp.	1	-	u
Aleocharinae sp. B	1	-	u
Trox ?scaber	1	-	rt-sf
Geotrupes sp.	1	-	oa-rf
Aphodius sp.	1	-	ob-rf
?Melolontha sp.	1	-	oa-p
Phyllopertha horticola	1	-	oa-p
Dermestidae sp.	1	-	rt-sf
Lyctus linearis	1	-	l-sf
?Omosita sp.	1	-	rt-sf
Ephistemus globulus	1	-	rd-sf
Olibrus aeneus	1	-	oa-p
Apion (Oxystoma) pomonae	1	-	oa-p
Apion sp.	1	-	oa-p
Curculionidae sp.	1	-	oa
*Auchenorhyncha sp. (nymph)	15	m	oa-p
*Acarina sp.	6	s	u
*Diptera sp. (puparium)	3	-	u
*Oligochaeta sp. (egg capsule)	2	-	u
*Aphidoidea sp.	2	-	u
*Coleoptera sp. (larva)	2	-	u
*Proctotrupoidea sp.	2	-	u
*Dermaptera sp.	1	-	u
*Diptera sp. (adult)	1	-	u
*Diptera sp. (larva)	1	-	u
*?Pulex irritans	1	-	ss
*Insecta sp. (larval case)	1	-	u

Context: 191 Sample: 1632/1 CA: 1632c ReM: RS
Weight: 3.00 E: 2.50 F: 2.50

Notes: Entered HK 3/9/03. Six-dish flot. E 1.5-3.5, mode 2.5 weak; F 1.504.0, mode 2.5 weak. Note record of Aglenus brunneus! Record if time, if only to include Aglenus in a formal list.

Cercyon analis	15	m	rt-sf
Ptenidium sp.	6	s	rt
Platystethus arenarius	6	s	rf
Gyrohypnus fracticornis	6	s	rt-st
Cryptophagus sp.	6	s	rd-sf
Atomaria sp.	6	s	rd
Lathridius minutus group	3	-	rd-st
Aglenus brunneus	3	-	rt-ss
Carpelimus ?bilineatus	2	-	rt-sf
Ephistemus globulus	2	-	rd-sf
Cercyon sp.	1	-	u
Megasternum obscurum	1	-	rt
Cryptopleurum minutum	1	-	rf-st
Hydrobius fuscipes	1	-	oa-w
Oxytelus sculptus	1	-	rt-st
Stenus sp.	1	-	u
Xantholinus sp.	1	-	u
Philonthus sp. A	1	-	u
Philonthus sp. B	1	-	u
Staphylinus sp.	1	-	u
Quedius sp.	1	-	u
Falagria or Cordalia sp.	1	-	rt-sf
Aleochara sp.	1	-	u
Aleocharinae sp. A	1	-	u
Aleocharinae sp. B	1	-	u
Geotrupes sp.	1	-	oa-rf
Aphodius sp. A	1	-	ob-rf
Aphodius sp. B	1	-	ob-rf
Phyllopertha horticola	1	-	oa-p
Ptinus sp.	1	-	rd-sf
Lyctus linearis	1	-	l-sf
Brachypterus sp.	1	-	oa-p
Omosita sp.	1	-	rt-sf
Rhizophagus sp.	1	-	u
Orthoperus sp.	1	-	rt
Corticaria sp. A	1	-	rt-sf
Corticaria sp. B	1	-	rt-sf
Chaetocnema ?concinna	1	-	oa-p
?Sitona sp.	1	-	oa-p
Gymnetron labile	1	-	oa-p
Scolytus rugulosus	1	-	l
*Acarina sp.	15	m	u
*Diptera sp. (puparium)	6	s	u
*Oligochaeta sp. (egg capsule)	3	-	u
*Forficula sp.	1	-	u

Context: 194 Sample: 2001/1 CA: 2001c ReM: RS
Weight: 3.00 E: 2.00 F: 2.00

Notes: Entered HK 3/9/03. Three-dish flot, harbaceous and woody detritus. E 1.5-2.5, mode

2.0 weak; F 1.5-3.0, mode 2.0 weak. Smallish group of insects; a few interesting remains, though not outstanding ecologically. Should not take too long to record. P1B.

Cercyon analis	3	-	rt-sf
Lathridius minutus group	3	-	rd-st
Phyllopertha horticola	2	-	oa-p
Pterostichus sp.	1	-	ob
Megasternum obscurum	1	-	rt
Hydrobius fuscipes	1	-	oa-w
Hydraena sp.	1	-	oa-w
Phyllodrepa salicis	1	-	rt-sf
Carpelimus sp.	1	-	u
Anotylus rugosus	1	-	rt
Oxytelus sculptus	1	-	rt-st
Aleocharinae sp.	1	-	u
?Sinodendron cylindricum	1	-	l
Trox scaber	1	-	rt-sf
Geotrupes sp.	1	-	oa-rf
Aphodius sp.	1	-	ob-rf
Lyctus linearis	1	-	l-sf
Monotoma sp.	1	-	rt-sf
Orthoperus sp.	1	-	rt
Corticaria sp.	1	-	rt-sf
Curculionidae sp.	1	-	oa
*Siphonaptera sp.	1	-	u

Context: 218 Sample: 1813/1 CA: 1813h ReM: RS
Weight: 2.50 E: 2.00 F: 2.00

Notes: Entered HK 3/9/03. Six-dish flot, many insects; woody and herbaceous detritus. E 1.5-4.0, mode 2.0 distinct; F 1.5-3.0, mode 2.0 weak. Rich assemblage, mostly well-preserved, but probably not worth recording as other samples from this context have been. One pair of shrivelled Trox elytra. Soma Apion parts soft.

Cercyon analis	6	s	rt-sf
Gyrohypnus fracticornis	6	s	rt-st
Philonthus sp. B	6	s	u
Lathridius minutus group	6	s	rd-st
Trox scaber	5	-	rt-sf
Cryptopleurum minutum	3	-	rf-st
Cryptophagus sp.	3	-	rd-sf
Coelostoma orbiculare	2	-	oa-w
Carpelimus ?bilineatus	2	-	rt-sf
Platystethus arenarius	2	-	rf
Philonthus sp. A	2	-	u
Phyllopertha horticola	2	-	oa-p
Pterostichus melanarius	1	-	ob
Helophorus sp.	1	-	oa-w
Cercyon ?atricapillus	1	-	rf-st
Cercyon ustulatus	1	-	oa-d
Megasternum obscurum	1	-	rt
Acritus nigricornis	1	-	rt-st
Ptenidium sp.	1	-	rt
Scydmaenidae sp.	1	-	u
Anotylus rugosus	1	-	rt
Oxytelus sculptus	1	-	rt-st
Stenus sp.	1	-	u
Creophilus maxillosus	1	-	rt
Falagria sp.	1	-	rt-sf
Aleocharinae sp. A	1	-	u
Aleocharinae sp. B	1	-	u
Aleocharinae sp. C	1	-	u
Geotrupes sp.	1	-	oa-rf
Aphodius ?prodromus	1	-	ob-rf
Clambus sp.	1	-	rt-sf
Dermestidae sp.	1	-	rt-sf
Ptinus sp.	1	-	rd-sf
Rhizophagus sp.	1	-	u
Monotoma sp.	1	-	rt-sf
Ephistemus globulus	1	-	rd-sf
Corticaria sp. A	1	-	rt-sf
Corticaria sp. B	1	-	rt-sf
Anthicus floralis or formicarius	1	-	rt-st
Phymatodes testaceus	1	-	l
Lema or Oulema sp.	1	-	oa-p
Phaedon sp.	1	-	oa-p
Apion sp.	1	-	oa-p
Hypera sp.	1	-	oa-p
Ceuthorhynchinae sp.	1	-	oa-p
Gymnetron sp.	1	-	oa-p
*Diptera sp. (puparium)	15	m	u
*?Damalinia sp.	1	-	u
*?Melophagus ovinus (adult)	1	-	u
*?Apis mellifera	1	-	u
*Formicidae sp.	1	-	u

Context: 218 Sample: 1835/1 CA: 1835h ReM: RS
Weight: 1.00 E: 2.50 F: 2.00

Notes: Entered HK 4/9/03. Five-dish flot. Not high priority to record in detail in view of other lists from the context. E 2.0-4.0, mode 2.5 distinct; F 1.5-3.0, mode 2.0 weak.

Cercyon analis	15	m	rt-sf
Philonthus sp. A	6	s	u
Atomaria sp.	6	s	rd
Gyrohypnus fracticornis	3	-	rt-st
Megasternum obscurum	2	-	rt
Carpelimus ?bilineatus	2	-	rt-sf
Platystethus arenarius	2	-	rf
Trox scaber	2	-	rt-sf
Lathridius minutus group	2	-	rd-st
Carabidae sp.	1	-	ob
Cercyon ?atricapillus	1	-	rf-st
Cercyon haemorrhoidalis	1	-	rf-sf
Cercyon unipunctatus	1	-	rf-st

Acritus nigricornis	1	-	rt-st
Catops sp.	1	-	u
Pycnoglypta lurida	1	-	rt
Xylodromus ?concinnus	1	-	rt-st
Anotylus rugosus	1	-	rt
Oxytelus sculptus	1	-	rt-st
Stenus sp.	1	-	u
Rugilus sp.	1	-	rt
Neobisnius sp.	1	-	u
Philonthus sp. B	1	-	u
Philonthus sp. C	1	-	u
Tachyporus sp.	1	-	u
Falagria or Cordalia sp.	1	-	rt-sf
Aleocharinae sp. A	1	-	u
Aleocharinae sp. B	1	-	u
Aleocharinae sp. C	1	-	u
Pselaphidae sp.	1	-	u
?Dermestidae sp.	1	-	rt-sf
Ptinus sp.	1	-	rd-sf
Cryptophagus sp.	1	-	rd-sf
Ephistemus globulus	1	-	rd-sf
Corticaria sp.	1	-	rt-sf
?Phytobius sp.	1	-	oa-d
Curculionidae sp.	1	-	oa
*Diptera sp. (puparium)	6	s	u
*Diptera sp. (adult)	1	-	u
*Trox scaber (larva)	1	-	rt-sf

Context: 218 Sample: 1835/T CA: 1835c ReM: D
Weight: 1.00 E: 2.00 F: 2.50

Notes: Entered HK 15/8/03. Was labelled 218, 218/T from assessment. Flot 15 mm in jar, primarily woody fragments. Recorded in flot and on filter paper. Appreciable numbers of associated parts, including leg and antennal bases. E 1.0-3.5, mode 2.0 distinct; F 1.0-3.5, mode 2.5 weak; trend to pale 0-2, mode 1. Trox preservation ranges from good to bad.

Carpelimus pusillus	15	-	rt-sf
Cordalia obscura	15	-	rt-sf
Cercyon analis	12	-	rt-sf
Carpelimus bilineatus	12	-	rt-sf
Aleocharinae sp. G	12	-	u
Acrotrichis sp.	10	-	rt
Pycnoglypta lurida	9	-	rt
Trox scaber	8	-	rt-sf
Ptenidium sp.	7	-	rt
Gyrohypnus angustatus	6	-	rt-st
Aleocharinae sp. F	6	-	u
Acritus nigricornis	5	-	rt-st
Platystethus arenarius	4	-	rf
Gyrohypnus fracticornis	4	-	rt-st
Philonthus sp. B	4	-	u
Ptiliidae sp.	3	-	u
Oxytelus sculptus	3	-	rt-st
Leptacinus sp.	3	-	rt-st
Aleocharinae sp. B	3	-	u
Aleocharinae sp. D	3	-	u
Cryptophagus sp. A	3	-	rd-sf
Atomaria sp. B	3	-	rd
Ephistemus globulus	3	-	rd-sf
Lathridius minutus group	3	-	rd-st
Megasternum obscurum	2	-	rt
Carpelimus ?gracilis	2	-	u
Anotylus nitidulus	2	-	rt
Leptacinus pusillus	2	-	rt-st
Philonthus sp. A	2	-	u
Falagria sp.	2	-	rt-sf
Aleocharinae sp. A	2	-	u
Aleocharinae sp. C	2	-	u
Ptinus sp.	2	-	rd-sf
Monotoma sp.	2	-	rt-sf
Orthoperus sp.	2	-	rt
Corticaria sp. A	2	-	rt-sf
Corticaria sp. B	2	-	rt-sf
Pterostichus nigrita	1	-	oa-d
Laemostenus ?terricola	1	-	ss
Cercyon atricapillus	1	-	rf-st
Cercyon haemorrhoidalis	1	-	rf-sf
Cercyon unipunctatus	1	-	rf-st
Cryptopleurum minutum	1	-	rf-st
Chaetarthria seminulum	1	-	oa-w
Phyllodrepa salicis	1	-	rt-sf
Xylodromus ?concinnus	1	-	rt-st
Anotylus rugosus	1	-	rt
Stenus sp. A	1	-	u
Stenus sp. B	1	-	u
Lithocharis ochracea	1	-	rt-st
Staphylininae sp. A	1	-	u
Staphylininae sp. B	1	-	u
Staphylininae sp. C	1	-	u
Crataraea suturalis	1	-	rt-st
Aleocharinae sp. E	1	-	u
Aphodius prodromus	1	-	ob-rf
Phyllopertha horticola	1	-	oa-p
Cyphon padi	1	-	oa-d
Elateridae sp.	1	-	ob
Cryptophagus sp. B	1	-	rd-sf
Atomaria sp. A	1	-	rd
Corticarina or Cortinicara sp.	1	-	rt
Anthicus floralis or formicarius	1	-	rt-st
Phymatodes testaceus	1	-	l
Phaedon ?cochlaeriae	1	-	oa-p
Chrysomelinae sp.	1	-	oa-p
Galerucella sp.	1	-	oa-p
Longitarsus sp.	1	-	oa-p
Apion sp. A	1	-	oa-p
Apion sp. B	1	-	oa-p
Hypera sp.	1	-	oa-p
Ceutorhynchus sp.	1	-	oa-p
Scolytus ?rugulosus	1	-	l
Dryocoetinus ?villosus	1	-	l
*Diptera sp. (puparium)	100	e	u

*Trox scaber (larva)	15	e	rt-sf
*Coleoptera sp. (larva)	15	m	u
*Acarina sp.	15	m	u
*Diptera sp. (pupa)	6	s	u
*Aranae sp.	6	s	u
*Proctotrupoidea sp.	3	-	u
*Diptera sp. (adult)	2	-	u
*Pulex irritans	2	-	ss
*Hymenoptera Parasitica sp.	2	-	u
*Daphnia sp. (ephippium)	1	-	oa-w
*Cladocera sp. F (ephippium)	1	-	oa-w
*Diplopoda sp.	1	-	u
*Coccoidea sp.	1	-	u
*Chalcidoidea sp.	1	-	u
*Formicidae sp.	1	-	u

Context: 218 Sample: 1881/1 CA: 1881w ReM: D
Weight: 2.60 E: 2.50 F: 2.50

Notes: Entered HK 21/8/03. Half a jar of flot, wood chips, bark fragments, 'straw', moss, seeds and leaf fragments. Recorded in flot and on filter paper. Some very good preservation, including intersegmental membranes, whole Trox and Hydrobius sclerites, etc. Some others very fragmented, perhaps especially in outdoor forms. Quite a lot of the Cercyon analis appear newly emerged. Several pale unexpanded Apion elytra. Sketches of distinctive beetle larvae on sheet.

Cercyon analis	26	-	rt-sf
Lathridius minutus group	18	-	rd-st
Pycnoglypta lurida	10	-	rt
Platystethus arenarius	6	-	rf
Aleocharinae sp. B	6	-	u
Cryptophagus sp. B	6	-	rd-sf
Atomaria sp.	6	-	rd
Acrotrichis sp.	5	-	rt
Philonthus sp. B	5	-	u
Corticaria sp. C	5	-	rt-sf
Ephistemus globulus	4	-	rd-sf
Apion sp. B	4	-	oa-p
Rhynchaenus quercus	4	-	oa-p
Cercyon unipunctatus	3	-	rf-st
Xylodromus ?concinnus	3	-	rt-st
Stenus sp. B	3	-	u
Gyrohypnus fracticornis	3	-	rt-st
Philonthus sp. A	3	-	u
Philonthus or Gabrius sp.	3	-	u
Cordalia obscura	3	-	rt-sf
Orthoperus sp.	3	-	rt
Corticaria sp. A	3	-	rt-sf
Lygaeidae sp.	2	-	oa-p
Cercyon ?atricapillus	2	-	rf-st
Cercyon tristis	2	-	oa-d
Megasternum obscurum	2	-	rt
Hydrobius fuscipes	2	-	oa-w
Ptiliidae sp.	2	-	u
Catops sp.	2	-	u
Tachyporus sp.	2	-	u
Aleocharinae sp. A	2	-	u
Aleocharinae sp. C	2	-	u
Aleocharinae sp. E	2	-	u
Aleocharinae sp. F	2	-	u
Aleocharinae sp. G	2	-	u
Pselaphidae sp.	2	-	u
Cyphon padi	2	-	oa-d
Ptinus sp.	2	-	rd-sf
Lyctus linearis	2	-	l-sf
Cryptophagus sp. A	2	-	rd-sf
Corticaria sp. B	2	-	rt-sf
Anaspis sp.	2	-	ob
Phymatodes testaceus	2	-	l
Temnostethus sp.	1	-	oa
Aphrodes flavostriatus	1	-	oa-p-d
Auchenorhyncha sp.	1	-	oa-p
Elaphrus cupreus	1	-	oa-d
?Tachys sp.	1	-	oa
Pterostichus diligens	1	-	oa-d
Pterostichus nigrita	1	-	oa-d
?Bradycellus sp.	1	-	oa
Carabidae sp.	1	-	ob
Coelostoma orbiculare	1	-	oa-w
Cercyon haemorrhoidalis	1	-	rf-sf
Cryptopleurum minutum	1	-	rf-st
Acritus nigricornis	1	-	rt-st
Ptenidium sp.	1	-	rt
Anthobium sp.	1	-	oa
Olophrum fuscum or piceum	1	-	oa
Olophrum sp.	1	-	oa
Acidota ?crenata	1	-	oa
Omalium excavatum	1	-	rt-sf
Carpelimus ?bilineatus	1	-	rt-sf
Platystethus cornutus group	1	-	oa-d
Anotylus nitidulus	1	-	rt
Anotylus rugosus	1	-	rt
Oxytelus sculptus	1	-	rt-st
Stenus sp. A	1	-	u
Rugilus ?orbiculatus	1	-	rt-sf
Othius sp.	1	-	rt
Gyrohypnus ?angustatus	1	-	rt-st
Quedius sp.	1	-	u
Aleocharinae sp. D	1	-	u
Aleocharinae sp. H	1	-	u
Trox scaber	1	-	rt-sf
Geotrupes sp.	1	-	oa-rf
Aphodius sp. A	1	-	ob-rf
Aphodius sp. B	1	-	ob-rf
Phyllopertha horticola	1	-	oa-p
Clambus sp.	1	-	rt-sf
Dermestidae sp.	1	-	rt-sf
Rhizophagus sp.	1	-	u
Monotoma picipes	1	-	rt-st
Cryptophagus scutellatus	1	-	rd-st

Cryptophagus sp. C	1	-	rd-sf
Cerylon ?ferrugineum	1	-	l
Corticaria elongata	1	-	rt-sf
Corticarina or Cortinicara sp.	1	-	rt
Litargus connexus	1	-	u
Orchesia undulata	1	-	l
Anthicus floralis or formicarius	1	-	rt-st
Phaedon ?armoraciae	1	-	oa-p
Prasocuris phellandrii	1	-	oa-p-d
Psylliodes sp.	1	-	oa-p
Halticinae sp.	1	-	oa-p
Apion (Oxystoma) sp.	1	-	oa-p
Apion sp. A	1	-	oa-p
Magdalis sp.	1	-	oa-p
Phytobius sp.	1	-	oa-d
Anthonomus sp.	1	-	oa-p
Gymnetron labile	1	-	oa-p
Curculionidae sp. A	1	-	oa
Curculionidae sp. B	1	-	oa
Scolytus rugulosus	1	-	l
Xyloterus domesticus	1	-	l
Coleoptera sp. A	1	-	u
Coleoptera sp. B	1	-	u
*Diptera sp. (puparium)	15	m	u
*Coleoptera sp. (larva)	15	m	u
*Aranae sp.	15	m	u
*Acarina sp.	15	m	u
*Oligochaeta sp. (egg capsule)	6	s	u
*?Damalinia sp.	6	-	u
*Diptera sp. (adult)	6	s	u
*Diptera sp. (pupa)	6	s	u
*Chalcidoidea sp.	6	s	u
*Hymenoptera Parasitica sp.	6	s	u
*Aphidoidea sp.	3	-	u
*Coccoidea sp.	3	-	u
*Bibionidae sp.	3	-	u
*Daphnia sp. (ephippium)	2	-	oa-w
*Formicidae sp.	2	-	u
*Proctotrupoidea sp.	2	-	u
*Diplopoda sp.	1	-	u
*Forficula sp.	1	-	u
*Auchenorhyncha sp. (nymph)	1	-	oa-p
*Diptera sp. (larva)	1	-	u
*Syrphidae sp. (larva)	1	-	u
*Pulex irritans	1	-	ss
*Elateridae sp. A (larva)	1	-	ob
*Elateridae sp. B (larva)	1	-	ob
*Elateridae sp. C (larva)	1	-	ob

Context: 253 Sample: 1989/1 CA: 1989 ReM: D
Weight: 3.00 E: 4.00 F: 3.50

Notes: Entered HK 4/9/03. Recorded in flot and on filter paper. Identifications frequently limited by decay and fragmentation. Only Lesteva dark and fresh, rest of fossils reddened. E 2.0-4.0, mode 4.0 weak; F 1.5-5.0, mode 3.5 weak; trend to yellow-orange 0-4, mode 3.

Lathridius minutus group	19	-	rd-st
Atomaria sp.	11	-	rd
Cryptophagus sp.	7	-	rd-sf
Corticaria sp. B	7	-	rt-sf
Cercyon analis	6	-	rt-sf
Xylodromus concinnus	5	-	rt-st
Cordalia obscura	4	-	rt-sf
Aleocharinae sp. B	4	-	u
Anotylus rugosus	3	-	rt
Cryptophagus ?scutellatus	3	-	rd-st
Carpelimus ?rivularis	2	-	ob-d
Stenus sp.	2	-	u
Aleocharinae sp. C	2	-	u
Aphodius prodromus	2	-	ob-rf
Lyctus linearis	2	-	l-sf
Corticarina or Cortinicara sp.	2	-	rt
?Longitarsus sp.	2	-	oa-p
Lygaeidae sp.	1	-	oa-p
Empicoris sp.	1	-	u
Cychrus rostratus	1	-	oa
Clivina fossor	1	-	oa
Pterostichus sp.	1	-	ob
Amara sp.	1	-	oa
Carabidae sp.	1	-	ob
Cercyon ?haemorrhoidalis	1	-	rf-sf
Cercyon ?terminatus	1	-	rf-st
Ptenidium sp.	1	-	rt
?Catops sp.	1	-	u
Anthobium sp.	1	-	oa
Lesteva longoelytrata	1	-	oa-d
Eusphalerum sp.	1	-	rt
Pycnoglypta lurida	1	-	rt
Dropephylla ioptera	1	-	u
Omalium sp.	1	-	rt
Coprophilus striatulus	1	-	rt-st
Carpelimus sp.	1	-	u
Platystethus arenarius	1	-	rf
Anotylus nitidulus	1	-	rt
Othius myrmecophilus	1	-	rt
Gyrohypnus fracticornis	1	-	rt-st
Neobisnius sp.	1	-	u
Philonthus sp. A	1	-	u
Philonthus sp. B	1	-	u
Quedius cinctus	1	-	rt
Aleocharinae sp. A	1	-	u
Trox scaber	1	-	rt-sf
Geotrupes sp.	1	-	oa-rf
Ptinus sp.	1	-	rd-sf
Omosita sp.	1	-	rt-sf
Rhizophagus sp.	1	-	u
Ephistemus globulus	1	-	rd-sf
Corticaria sp. A	1	-	rt-sf
Typhaea stercorea	1	-	rd-ss
Donaciinae sp.	1	-	oa-d-p
Chrysolina ?fastuosa	1	-	oa-p

Chrysomelinae sp.	1	-	oa-p
Chaetocnema concinna	1	-	oa-p
Apion sp. A	1	-	oa-p
Apion sp. B	1	-	oa-p
Hypera sp.	1	-	oa-p
Phytobius sp.	1	-	oa-d
Ceuthorhynchinae sp.	1	-	oa-p
Limnobaris pilistriata	1	-	oa-p-d
Coleoptera sp.	1	-	u
*Auchenorhyncha sp. (nymph)	15	m	oa-p
*Diptera sp. (larva)	15	m	u
*Acarina sp.	15	m	u
*Diptera sp. (puparium)	6	s	u
*Hymenoptera Parasitica sp.	2	-	u
*Oligochaeta sp. (egg capsule)	1	-	u
*Lepidoptera sp. (pupa)	1	-	u
*Siphonaptera sp.	1	-	u
*Coleoptera sp. (larva)	1	-	u

Context: 257 Sample: 1994/1 CA: 1994c ReM: D
Weight: 3.00 E: 3.00 F: 3.00

Notes: Entered HK 4/9/03. Four-dish flot. Recorded in flot and on filter paper. Rather a lot of tiny fragments, primarily of outdoor forms but also of some synanthopes; even small sclerites often broken. E 2.0-4.0, mode 3.0 weak; F 2.0-5.0, mode 3.0 weak; trend to pale 1-2, mode 1. Xylodromus fossils here (as in some other samples) variable, perhaps more than one species). Pulex: some rather decayed, one distorted head, perhaps unexpanded.

Lathridius minutus group	18	-	rd-st
Cercyon analis	17	-	rt-sf
Cryptophagus sp. C	8	-	rd-sf
Atomaria sp. C	7	-	rd
Ptenidium sp. B	6	-	rt
Ephistemus globulus	5	-	rd-sf
Corticaria sp. A	5	-	rt-sf
Philonthus sp. A	4	-	u
Cordalia obscura	4	-	rt-sf
Cryptophagus sp. B	4	-	rd-sf
Apion sp.	4	-	oa-p
Xylodromus ?concinnus	3	-	rt-st
Anotylus rugosus	2	-	rt
Tachyporus sp.	2	-	u
Aleocharinae sp. B	2	-	u
Aleocharinae sp. C	2	-	u
Aleocharinae sp. D	2	-	u
Phyllopertha horticola	2	-	oa-p
Lyctus linearis	2	-	l-sf
Cryptophagus sp. A	2	-	rd-sf
Atomaria sp. B	2	-	rd
Orthoperus sp.	2	-	rt
Enicmus sp.	2	-	rt-sf
Lygaeidae sp.	1	-	oa-p
Dyschirius ?globosus	1	-	oa
?Trechus sp.	1	-	ob
Pterostichus sp.	1	-	ob
?Calathus sp.	1	-	oa
Carabidae sp.	1	-	ob
Helophorus aquaticus or grandis	1	-	oa-w
Megasternum obscurum	1	-	rt
Acritus nigricornis	1	-	rt-st
Ptenidium sp. A	1	-	rt
Micropeplus fulvus	1	-	rt
Proteinus sp.	1	-	rt
Eusphalerum sp.	1	-	rt
Omalium excavatum	1	-	rt-sf
Carpelimus ?bilineatus	1	-	rt-sf
Platystethus arenarius	1	-	rf
Platystethus cornutus group	1	-	oa-d
Stenus sp.	1	-	u
Lathrobium sp.	1	-	u
Leptacinus sp.	1	-	rt-st
Gyrohypnus fracticornis	1	-	rt-st
Philonthus sp. B	1	-	u
Sepedophilus sp.	1	-	u
Falagria sp.	1	-	rt-sf
?Crataraea suturalis	1	-	rt-st
Aleocharinae sp. A	1	-	u
Trox scaber	1	-	rt-sf
Aphodius ?contaminatus	1	-	oa-rf
Aphodius sp.	1	-	ob-rf
Elateridae sp.	1	-	ob
Ptinus raptor	1	-	rd-sf
Atomaria sp. A	1	-	rd
Atomaria sp. D	1	-	rd
Cerylon ferrugineum	1	-	l
Corticaria sp. B	1	-	rt-sf
Corticarina sp.	1	-	rt
Rhagium bifasciatum	1	-	oa-p
Phymatodes testaceus	1	-	l
Bruchidae sp.	1	-	u
?Plateumaris sp.	1	-	oa-d-p
Apion (Oxystoma) sp.	1	-	oa-p
?Strophosomus sp.	1	-	oa-p
Ceutorhynchus sp.	1	-	oa-p
Ceuthorhynchinae sp. A	1	-	oa-p
Ceuthorhynchinae sp. B	1	-	oa-p
Gymnetron sp.	1	-	oa-p
Curculionidae sp.	1	-	oa
Curculionidae sp. A	1	-	oa
Curculionidae sp. B	1	-	oa
Curculionidae sp. C	1	-	oa
*Acarina sp.	15	m	u
*Diptera sp. (puparium)	6	s	u
*Pulex irritans	6	-	ss
*Coleoptera sp. (larva)	6	s	u
*Auchenorhyncha sp. (nymph)	3	-	oa-p
*Chalcidoidea sp.	2	-	u
*Hymenoptera Parasitica sp.	1	-	u
*Aranae sp.	1	-	u

Context: 257 Sample: 1994/1 CA: 1994h/II ReM: D
Weight: 1.00 E: 2.50 F: 2.00

Notes: Entered HK 4/9/03. Flot less than 1 dish. Recorded in flot and on filter paper. E 2.0-3.5, mode 2.5 weak; F 1.5-3.0, mode 2.0 weak. Very small group of remains: more in /T.

Carpelimus sp.	3	-	u
Carpelimus ?bilineatus	1	-	rt-sf
Platystethus arenarius	1	-	rf
Anotylus rugosus	1	-	rt
Oxytelus sculptus	1	-	rt-st
Stenus sp.	1	-	u
Philonthus sp.	1	-	u
Staphylininae sp.	1	-	u
Cordalia obscura	1	-	rt-sf
Aleocharinae sp.	1	-	u
Aphodius sp.	1	-	ob-rf
Phyllopertha horticola	1	-	oa-p
Ptinus ?fur	1	-	rd-sf
Enicmus sp.	1	-	rt-sf
Corticaria sp. A	1	-	rt-sf
Corticaria sp. B	1	-	rt-sf
Chaetocnema arida group	1	-	oa-p
*Pulex irritans	1	-	ss

Context: 270 Sample: 2018/1 CA: 2018c ReM: D
Weight: 3.00 E: 2.50 F: 2.50

Notes: Entered HK 20/8/03. Four-dish flot, mostly woody debris. Recorded in flot and on filter paper. Many remains fragmented and beyond identification. E 1.5-3.5, mode 2.5 distinct; F 1.0-5.0, mode 2.5 weak. Apion sp. pale remains.

Cercyon analis	16	-	rt-sf
Lathridius minutus group	11	-	rd-st
Corticaria sp. B	10	-	rt-sf
Atomaria sp.	8	-	rd
Orthoperus sp.	6	-	rt
Platystethus arenarius	5	-	rf
Aleocharinae sp. A	5	-	u
Cryptophagus sp.	4	-	rd-sf
Anotylus rugosus	3	-	rt
Philonthus sp. B	3	-	u
Cordalia obscura	3	-	rt-sf
Falagria caesa or sulcatula	3	-	rt-sf
Aleocharinae sp. C	3	-	u
Ephistemus globulus	3	-	rd-sf
Conomelus anceps	2	-	oa-p
Cercyon ustulatus	2	-	oa-d
Hydrobius fuscipes	2	-	oa-w
Carpelimus bilineatus	2	-	rt-sf
Carpelimus rivularis	2	-	ob-d
Anotylus nitidulus	2	-	rt
Stenus sp. A	2	-	u
Xantholinus linearis	2	-	rt-sf
Philonthus sp. A	2	-	u
Staphylininae sp.	2	-	u
Aphodius ?prodromus	2	-	ob-rf
Phyllopertha horticola	2	-	oa-p
Plateumaris sp.	2	-	oa-d-p
Lygaeidae sp.	1	-	oa-p
Lyctocoris campestris	1	-	rd-st
Cercopidae sp.	1	-	oa-p
Delphacidae sp. A	1	-	oa-p
Delphacidae sp. B	1	-	oa-p
Delphacidae sp. C	1	-	oa-p
Delphacidae sp. D	1	-	oa-p
Psylloidea sp.	1	-	oa-p
Carabus sp.	1	-	oa
Pterostichus sp.	1	-	ob
?Amara sp.	1	-	oa
Helophorus aquaticus or grandis	1	-	oa-w
Coelostoma orbiculare	1	-	oa-w
Cercyon ?haemorrhoidalis	1	-	rf-sf
Megasternum obscurum	1	-	rt
Cryptopleurum minutum	1	-	rf-st
Laccobius sp.	1	-	oa-w
Chaetarthria seminulum	1	-	oa-w
Acritus nigricornis	1	-	rt-st
Ptenidium sp.	1	-	rt
Scydmaenidae sp.	1	-	u
Olophrum ?fuscum	1	-	oa
Eusphalerum sp.	1	-	rt
Pycnoglypta lurida	1	-	rt
Xylodromus ?concinnus	1	-	rt-st
Oxytelus sculptus	1	-	rt-st
Stenus sp. B	1	-	u
Othius sp.	1	-	rt
Gyrohypnus ?angustatus	1	-	rt-st
Neobisnius sp.	1	-	u
Philonthus sp. C	1	-	u
Tachyporus obtusus	1	-	u
Aleocharinae sp. B	1	-	u
Aleocharinae sp. D	1	-	u
Pselaphidae sp.	1	-	u
Trox scaber	1	-	rt-sf
Geotrupes sp.	1	-	oa-rf
Aphodius ?contaminatus	1	-	oa-rf
Aphodius sp.	1	-	ob-rf
Melolontha sp.	1	-	oa-p
Clambus ?pubescens	1	-	rt-sf
Clambus sp.	1	-	rt-sf
Elateridae sp.	1	-	ob
Elateridae sp. B	1	-	ob
Ptinus ?raptor	1	-	rd-sf
Lyctus linearis	1	-	l-sf
Brachypterus sp.	1	-	oa-p
Omosita colon	1	-	rt-sf
Rhizophagus ?bipustulatus	1	-	l
Rhizophagus parallelocollis	1	-	rt-sf
Monotoma sp.	1	-	rt-sf

Corticaria sp. A	1	-	rt-sf
Corticarina sp.	1	-	rt
Cortinicara gibbosa	1	-	rt
?Cerambycidae sp.	1	-	l
Donaciinae sp.	1	-	oa-d-p
Chaetocnema arida group	1	-	oa-p
Apion (Oxystoma) sp.	1	-	oa-p
Apion sp.	1	-	oa-p
Rhynchaenus sp.	1	-	oa-p
Curculionidae sp.	1	-	oa
*Diptera sp. (puparium)	15	m	u
*Acarina sp.	15	m	u
*Coleoptera sp. (larva)	6	s	u
*Aranae sp.	6	s	u
*Hymenoptera Parasitica sp.	3	-	u
*Oligochaeta sp. (egg capsule)	2	-	u
*Auchenorhyncha sp. (nymph)	2	-	oa-p
*Diptera sp. (adult)	2	-	u
*Proctotrupoidea sp.	2	-	u
*Daphnia sp. (ephippium)	1	-	oa-w
*Cladocera sp. (ephippium)	1	-	oa-w
*Lepidoptera sp. (pupa)	1	-	u
*Syrphidae sp. (larva)	1	-	u
*Pulex irritans	1	-	ss
*Chalcidoidea sp.	1	-	u
*Formicidae sp.	1	-	u

Context: 274 Sample: 2016/1 CA: 2016f/I ReM: D
Weight: 3.00 E: 3.00 F: 2.50

Notes: Entered HK 4/9/03. Three-dish flot, with charcoal, woody detritus, seeds and quite a lot of invertebrate fragments. Recorded in flot and on filter paper. Much fragmented, some minute fragments could not be listed. Some well-decayed fossils, Apion cerdo elytra mostly soft, also one Hypera elytron. Trend to pale in Ptinus, some Lathridius and Cryptophagus. E 1.5-4.0, mode 3.0 weak; F 1.5-4.0, mode 2.5 weak.

Apion (Oxystoma) cerdo	15	-	oa-p
Lathridius minutus group	12	-	rd-st
Ptenidium sp.	6	-	rt
Corticaria sp. B	5	-	rt-sf
Cryptophagus sp.	4	-	rd-sf
Cercyon ustulatus	3	-	oa-d
Aleocharinae sp. A	3	-	u
Ptinus raptor	3	-	rd-sf
Orthoperus sp.	3	-	rt
Gymnetron ?antirrhini	3	-	oa-p
Cercyon analis	2	-	rt-sf
Cercyon haemorrhoidalis	2	-	rf-sf
Hydrobius fuscipes	2	-	oa-w
Platystethus arenarius	2	-	rf
Philonthus sp. D	2	-	u
Aphodius ?fimetarius	2	-	oa-rf
Aphodius ?prodromus	2	-	ob-rf
Apion sp. B	2	-	oa-p
Sitona ?suturalis	2	-	oa-p
Hypera sp.	2	-	oa-p
Aphrodes flavostriatus	1	-	oa-p-d
Cicadellidae sp.	1	-	oa-p
Pterostichus sp.	1	-	ob
Carabidae sp.	1	-	ob
Helophorus sp.	1	-	oa-w
Cryptopleurum minutum	1	-	rf-st
Acritus nigricornis	1	-	rt-st
Catops sp.	1	-	u
Aclypea opaca	1	-	ob-rt
Silphidae sp.	1	-	u
Megarthrus sp.	1	-	rt
Lesteva longoelytrata	1	-	oa-d
Carpelimus ?bilineatus	1	-	rt-sf
Anotylus nitidulus	1	-	rt
Anotylus rugosus	1	-	rt
Oxytelus sculptus	1	-	rt-st
Stenus sp. A	1	-	u
Stenus sp. B	1	-	u
Rugilus sp.	1	-	rt
Leptacinus ?intermedius	1	-	rt-st
Gyrohypnus ?angustatus	1	-	rt-st
Philonthus sp. A	1	-	u
Philonthus sp. B	1	-	u
Philonthus sp. C	1	-	u
Philonthus or Gabrius sp.	1	-	u
Staphylininae sp.	1	-	u
Falagria or Cordalia sp.	1	-	rt-sf
Aleocharinae sp. B	1	-	u
Aleocharinae sp. C	1	-	u
Sinodendron cylindricum	1	-	l
Trox scaber	1	-	rt-sf
Geotrupes sp.	1	-	oa-rf
Phyllopertha horticola	1	-	oa-p
Clambus pubescens	1	-	rt-sf
Clambus sp.	1	-	rt-sf
Anobium ?punctatum	1	-	l-sf
Necrobia violacea	1	-	rt-sf
Ephistemus globulus	1	-	rd-sf
Corticaria sp. A	1	-	rt-sf
Corticaria sp. C	1	-	rt-sf
Bruchidae sp.	1	-	u
Chrysomelinae sp.	1	-	oa-p
Chaetocnema arida group	1	-	oa-p
Apion sp. A	1	-	oa-p
Sitona lepidus	1	-	oa-p
Curculionidae sp.	1	-	oa
*Acarina sp.	15	m	u
*Diptera sp. (puparium)	6	s	u
*Proctotrupoidea sp.	6	s	u
*Auchenorhyncha sp. (nymph)	3	-	oa-p
*Coleoptera sp. (larva)	2	-	u
*Chalcidoidea sp.	2	-	u
*Oligochaeta sp. (egg capsule)	1	-	u
*Diptera sp. (adult)	1	-	u

*Bibionidae sp.	1	-	u
*Siphonaptera sp.	1	-	u
*Elateridae sp. (larva)	1	-	ob
*Apoidea sp.	1	-	u

Context: 274 Sample: 2017/1 CA: 2017/I ReM: D
Weight: 3.00 E: 3.00 F: 3.00

Notes: Entered HK 4/9/03. One-dish flot, plus some 'bark rolls'. Recorded in flot and on fitler paper. E 1.5-4.0, mode 3.0 weak; F 1.5-5.0, mode 3.0 weak.

Cordalia obscura	2	-	rt-sf
Ptinus raptor	2	-	rd-sf
Cryptophagus sp. B	2	-	rd-sf
Lathridius minutus group	2	-	rd-st
Corticaria sp. B	2	-	rt-sf
Lygaeidae sp.	1	-	oa-p
Cicadellidae sp.	1	-	oa-p
Delphacidae sp.	1	-	oa-p
Bembidion sp.	1	-	oa
Carabidae sp.	1	-	ob
Cercyon analis	1	-	rt-sf
Cercyon sp.	1	-	u
Ptenidium sp.	1	-	rt
Ptiliidae sp.	1	-	u
Catops sp.	1	-	u
Carpelimus ?bilineatus	1	-	rt-sf
Anotylus rugosus	1	-	rt
Stenus sp.	1	-	u
Philonthus sp. A	1	-	u
Philonthus sp. B	1	-	u
Aleocharinae sp.	1	-	u
Trox scaber	1	-	rt-sf
Geotrupes sp.	1	-	oa-rf
Aphodius sp. A	1	-	ob-rf
Aphodius sp. B	1	-	ob-rf
Phyllopertha horticola	1	-	oa-p
Clambus sp.	1	-	rt-sf
Cryptophagus sp. A	1	-	rd-sf
Atomaria sp.	1	-	rd
Ephistemus globulus	1	-	rd-sf
Orthoperus sp.	1	-	rt
Corticaria sp. A	1	-	rt-sf
Apion sp.	1	-	oa-p
Curculionidae sp.	1	-	oa
*Acarina sp.	15	m	u
*Diptera sp. (adult)	2	-	u
*Oligochaeta sp. (egg capsule)	1	-	u
*Cladocera sp. F (ephippium)	1	-	oa-w
*Pentatomidae sp. (nymph)	1	-	oa-p
*Diptera sp. (puparium)	1	-	u
*Siphonaptera sp.	1	-	u
*Coleoptera sp. (larva)	1	-	u
*Chalcidoidea sp.	1	-	u
*Formicidae sp.	1	-	u
*Proctotrupoidea sp.	1	-	u

Context: 301 Sample: 2385/1 CA: 2385c ReM: D
Weight: 2.00 E: 2.50 F: 2.50

Notes: Entered HK 4/9/03. Three to four dish flot, bran, woody and herbaceous detritus, many puparia. Quite a lot of tiny fragments, especially ground beetles and ?Chrysomelidae. Some fossils well-decayed, including some of the bee parts. E 2.0-4.5, mode 2.5 weak; F 2.0-5.0, mode 2.5 weak. Soft Apion elytron.

Lathridius minutus group	14	-	rd-st
Cercyon analis	9	-	rt-sf
Ephistemus globulus	6	-	rd-sf
Orthoperus sp.	6	-	rt
Cryptophagus sp. A	5	-	rd-sf
Carpelimus bilineatus	4	-	rt-sf
Gyrohypnus fracticornis	4	-	rt-st
Acritus nigricornis	3	-	rt-st
Xylodromus concinnus	3	-	rt-st
Anotylus rugosus	3	-	rt
Philonthus sp. C	3	-	u
Aphodius sp.	3	-	ob-rf
Ptinus raptor	3	-	rd-sf
Atomaria sp.	3	-	rd
Chaetarthria seminulum	2	-	oa-w
Ptenidium sp.	2	-	rt
Oxytelus sculptus	2	-	rt-st
Stenus sp. A	2	-	u
Philonthus sp. D	2	-	u
Cordalia obscura	2	-	rt-sf
Crataraea suturalis	2	-	rt-st
Clambus pubescens	2	-	rt-sf
Cyphon sp.	2	-	oa-d
Cryptophagus sp. B	2	-	rd-sf
Corticaria sp. A	2	-	rt-sf
Phymatodes testaceus	2	-	l
Scolytus rugulosus	2	-	l
Saldula sp.	1	-	oa-d
Delphacidae sp.	1	-	oa-p
Sphaerius acaroides	1	-	u
Dyschirius globosus	1	-	oa
Pterostichus sp.	1	-	ob
Carabidae sp. A	1	-	ob
Carabidae sp. B	1	-	ob
Helophorus aquaticus or grandis	1	-	oa-w
Helophorus sp.	1	-	oa-w
Cercyon haemorrhoidalis	1	-	rf-sf
Cercyon terminatus	1	-	rf-st
Cercyon unipunctatus	1	-	rf-st
Cryptopleurum minutum	1	-	rf-st
Hydrobius fuscipes	1	-	oa-w
Histeridae sp.	1	-	u
Hydraena sp.	1	-	oa-w
Catops sp.	1	-	u
Pycnoglypta lurida	1	-	rt
Omalium ?excavatum	1	-	rt-sf
Carpelimus elongatulus	1	-	oa-d

Platystethus arenarius	1	-	rf
Stenus sp. B	1	-	u
Leptacinus ?pusillus	1	-	rt-st
Philonthus sp. A	1	-	u
Philonthus sp. B	1	-	u
Tachinus ?signatus	1	-	u
Aleocharinae sp. A	1	-	u
Aleocharinae sp. B	1	-	u
Aleocharinae sp. C	1	-	u
Aleocharinae sp. D	1	-	u
Aleocharinae sp. E	1	-	u
Aleocharinae sp. F	1	-	u
Pselaphidae sp.	1	-	u
Geotrupes sp.	1	-	oa-rf
Melolontha sp.	1	-	oa-p
Phyllopertha horticola	1	-	oa-p
Clambus sp.	1	-	rt-sf
Elateridae sp.	1	-	ob
Dermestes sp.	1	-	rt-sf
Lyctus linearis	1	-	l-sf
Corticaria sp. B	1	-	rt-sf
Corticarina or Cortinicara sp.	1	-	rt
Cisidae sp.	1	-	l
Cerambycidae sp.	1	-	l
Chrysolina sp.	1	-	oa-p
Chrysomelinae sp.	1	-	oa-p
Altica sp.	1	-	oa-p
Apion sp.	1	-	oa-p
Gymnetron labile	1	-	oa-p
Rhynchaenus sp.	1	-	oa-p
Curculionidae sp.	1	-	oa
Taphrorychus bicolor	1	-	l
Coleoptera sp.	1	-	u
*Diptera sp. (puparium)	200	e	u
*Acarina sp.	15	m	u
*Coleoptera sp. (larva)	6	s	u
*Proctotrupoidea sp.	3	-	u
*Damalinia sp.	2	-	u
*Diptera sp. (adult)	2	-	u
*Pulex irritans	2	-	ss
*Trox scaber (larva)	2	-	rt-sf
*Apis mellifera	2	-	u
*Chalcidoidea sp.	2	-	u
*Formicidae sp.	2	-	u
*Aranae sp.	2	-	u
*Cladocera sp. F (ephippium)	1	-	oa-w
*Cladocera sp. S (ephippium)	1	-	oa-w
*Pediculus humanus	1	-	ss
*Auchenorhyncha sp. (nymph)	1	-	oa-p
*Aphidoidea sp.	1	-	u
*Diptera sp. (pupa)	1	-	u
*?Melophagus ovinus (puparium)	1	-	u
*Elateridae sp. (larva)	1	-	ob

Context: 303 Sample: 2362/1 CA: 2362c ReM: D
Weight: 3.00 E: 2.00 F: 2.50

Notes: Entered HK 5/9/03. Flot 1.5 cm in jar, herbaceous debris including bran, and puparia. Recorded in flot and on filter paper. Some very good preservation, with mouthparts etc, lots of hairs and scales, life colours. Also some very fragmented remains. E 1.0-3.5, mode 2.0 weak; F 1.0-4.5, mode 2.5 weak to distinct.

Lathridius minutus group	19	-	rd-st
Cercyon analis	7	-	rt-sf
Atomaria sp. B	7	-	rd
Ptinus raptor	5	-	rd-sf
Cryptophagus sp. C	5	-	rd-sf
Orthoperus sp.	5	-	rt
Cercyon terminatus	4	-	rf-st
Xylodromus concinnus	4	-	rt-st
Carpelimus bilineatus	4	-	rt-sf
Philonthus sp. B	4	-	u
Cryptophagus sp. B	4	-	rd-sf
Hebrus sp.	3	-	oa-w
Megasternum obscurum	3	-	rt
Chaetarthria seminulum	3	-	oa-w
Acrotrichis sp.	3	-	rt
Gyrohypnus fracticornis	3	-	rt-st
Aleocharinae sp. B	3	-	u
Phyllopertha horticola	3	-	oa-p
Cryptophagus sp. A	3	-	rd-sf
Ephistemus globulus	3	-	rd-sf
Dyschirius globosus	2	-	oa
Cercyon unipunctatus	2	-	rf-st
Acritus nigricornis	2	-	rt-st
Ptenidium sp.	2	-	rt
Platystethus arenarius	2	-	rf
Oxytelus sculptus	2	-	rt-st
Stenus sp. A	2	-	u
Philonthus sp. A	2	-	u
Aleocharinae sp. C	2	-	u
Aleocharinae sp. D	2	-	u
Aphodius sp. B	2	-	ob-rf
Cryptophagus sp. D	2	-	rd-sf
Cerylon ferrugineum	2	-	l
Corticaria sp. A	2	-	rt-sf
Cortinicara gibbosa	2	-	rt
Phymatodes testaceus	2	-	l
Saldula sp.	1	-	oa-d
Gerris sp.	1	-	oa-w
Heteroptera sp.	1	-	u
Cicadellidae sp.	1	-	oa-p
?Conomelus anceps	1	-	oa-p
Pterostichus nigrita	1	-	oa-d
Hydroporinae sp.	1	-	oa-w
Colymbetinae sp.	1	-	oa-w
Helophorus aquaticus or grandis	1	-	oa-w
Helophorus sp.	1	-	oa-w
Cryptopleurum minutum	1	-	rf-st
Hydrobius fuscipes	1	-	oa-w
Anthobium sp.	1	-	oa
Phyllodrepa salicis	1	-	rt-sf

?Dropephylla sp.	1	-	u
Platystethus cornutus group	1	-	oa-d
Anotylus nitidulus	1	-	rt
Anotylus rugosus	1	-	rt
Stenus sp. B	1	-	u
Lathrobium sp.	1	-	u
Rugilus orbiculatus	1	-	rt-sf
Leptacinus ?pusillus	1	-	rt-st
Philonthus sp. C	1	-	u
Quedius sp. A	1	-	u
Quedius sp. B	1	-	u
Staphylininae sp.	1	-	u
Falagria or Cordalia sp.	1	-	rt-sf
Aleocharinae sp. A	1	-	u
Aleocharinae sp. E	1	-	u
Geotrupes sp.	1	-	oa-rf
Aphodius sp. A	1	-	ob-rf
Clambus sp.	1	-	rt-sf
Simplocaria ?semistriata	1	-	oa-p
Lyctus linearis	1	-	l-sf
Brachypterus sp.	1	-	oa-p
Rhizophagus parallelocollis	1	-	rt-sf
Monotoma sp.	1	-	rt-sf
Atomaria sp. A	1	-	rd
Adalia ?decimpunctata	1	-	oa-p
Corticaria sp. B	1	-	rt-sf
Donaciinae sp.	1	-	oa-d-p
Apion sp. A	1	-	oa-p
Apion sp. B	1	-	oa-p
Otiorhynchus porcatus	1	-	oa-p
Strophosomus sp.	1	-	oa-p
Hypera sp.	1	-	oa-p
Ceuthorhynchinae sp.	1	-	oa-p
Rhynchaenus sp.	1	-	oa-p
Scolytus rugulosus	1	-	l
*Diptera sp. (puparium)	100	e	u
*Diptera sp. (adult)	15	m	u
*Acarina sp.	15	m	u
*Coleoptera sp. (larva)	6	s	u
*Proctotrupoidea sp.	6	s	u
*Aranae sp.	6	s	u
*Pulex irritans	2	-	ss
*Apis mellifera	2	-	u
*?Damalinia sp.	1	-	u
*Auchenorhyncha sp. (nymph)	1	-	oa-p
*Coccoidea sp.	1	-	u
*?Lacon quercus (larva)	1	-	oa
*Chalcidoidea sp.	1	-	u
*Hymenoptera Parasitica sp.	1	-	u

Context: 304 Sample: 2406/1 ReM: D
Weight: 3.00 E: 2.00 F: 2.50

Notes: Entered HK 8/9/03. Flot 1.75 cm in jar, wood chips and bran. Recorded in flot and on filter paper. E 1.5-3.5, mode 2.0 weak; F 2.0-5.0, mode 2.5, distinct. Some identifications limited by fragmentation. Trend to pale 0-3, mode 0 strong.

Lathridius minutus group	12	-	rd-st
Carpelimus bilineatus	7	-	rt-sf
Cercyon analis	6	-	rt-sf
Dyschirius globosus	4	-	oa
Xylodromus ?concinnus	4	-	rt-st
Chaetarthria seminulum	3	-	oa-w
Gyrohypnus fracticornis	3	-	rt-st
Phyllopertha horticola	3	-	oa-p
Cryptophagus sp. A	3	-	rd-sf
Hebrus ?ruficeps	2	-	oa-w
Delphacidae sp. A	2	-	oa-p
Sphaerius acaroides	2	-	u
Pterostichus diligens	2	-	oa-d
Cercyon haemorrhoidalis	2	-	rf-sf
Megasternum obscurum	2	-	rt
Olophrum sp.	2	-	oa
Oxytelus sculptus	2	-	rt-st
Cordalia obscura	2	-	rt-sf
Aleocharinae sp. C	2	-	u
Aleocharinae sp. D	2	-	u
Cyphon padi	2	-	oa-d
Ptinus ?raptor	2	-	rd-sf
Lyctus linearis	2	-	l-sf
Ephistemus globulus	2	-	rd-sf
Orthoperus sp. A	2	-	rt
Enicmus sp.	2	-	rt-sf
Corticaria sp. C	2	-	rt-sf
Trapezonotus sp.	1	-	oa-p
Lygaeidae sp.	1	-	oa-p
Chartoscirta sp.	1	-	oa-w
Microvelia sp.	1	-	oa-w
Ulopa ?reticulata	1	-	oa-p-m
Aphrodes sp.	1	-	oa-p
Cicadellidae sp.	1	-	oa-p
Delphacidae sp. B	1	-	oa-p
Patrobus sp.	1	-	oa
Amara sp.	1	-	oa
Carabidae sp.	1	-	ob
Helophorus sp.	1	-	oa-w
Coelostoma orbiculare	1	-	oa-w
Cercyon ?tristis	1	-	oa-d
Laccobius sp.	1	-	oa-w
Enochrus sp.	1	-	oa-w
Hydrophilinae sp.	1	-	oa-w
Acritus nigricornis	1	-	rt-st
Ochthebius sp.	1	-	oa-w
Hydraena sp.	1	-	oa-w
Ptenidium sp.	1	-	rt
Acrotrichis sp.	1	-	rt
Scydmaenidae sp.	1	-	u
Phyllodrepa salicis	1	-	rt-sf
Dropephylla sp.	1	-	u
Platystethus arenarius	1	-	rf
Anotylus nitidulus	1	-	rt
Anotylus rugosus	1	-	rt

Stenus sp. A	1	-	u
Stenus sp. B	1	-	u
Stenus sp. C	1	-	u
Euaesthetus bipunctatus	1	-	oa
Lathrobium sp. A	1	-	u
Lathrobium sp. B	1	-	u
Medon sp.	1	-	u
Rugilus orbiculatus	1	-	rt-sf
Leptacinus sp.	1	-	rt-st
Xantholinus linearis	1	-	rt-sf
Philonthus sp.	1	-	u
Staphylininae sp.	1	-	u
Tachyporus sp.	1	-	u
Falagria sp.	1	-	rt-sf
Crataraea suturalis	1	-	rt-st
Aleocharinae sp. A	1	-	u
Aleocharinae sp. B	1	-	u
Aleocharinae sp. E	1	-	u
Aleocharinae sp. F	1	-	u
Pselaphidae sp.	1	-	u
?Geotrupes sp.	1	-	oa-rf
Aphodius sp. A	1	-	ob-rf
Aphodius sp. B	1	-	ob-rf
Clambus sp.	1	-	rt-sf
Rhizophagus ?bipustulatus	1	-	l
Monotoma sp.	1	-	rt-sf
Cryptophagus sp. B	1	-	rd-sf
Atomaria sp.	1	-	rd
Cerylon ferrugineum	1	-	l
Orthoperus sp. B	1	-	rt
Corticaria sp. A	1	-	rt-sf
Corticaria sp. B	1	-	rt-sf
Corticarina or Cortinicara sp.	1	-	rt
Rhinosimus ruficollis	1	-	l
Phymatodes testaceus	1	-	l
Plateumaris affinis	1	-	oa-d-p
Donaciinae sp.	1	-	oa-d-p
Phyllotreta sp.	1	-	oa-p
Chaetocnema arida group	1	-	oa-p
Apion sp. A	1	-	oa-p
Apion sp. B	1	-	oa-p
?Thryogenes sp.	1	-	oa-p
Limnobaris ?pilistriata	1	-	oa-p-d
Rhynchaenus ?quercus	1	-	oa-p
Scolytidae sp.	1	-	l
Coleoptera sp. A	1	-	u
Coleoptera sp. B	1	-	u
Coleoptera sp. C	1	-	u
*Diptera sp. (puparium)	15	m	u
*Acarina sp.	15	m	u
*Diptera sp. (adult)	6	s	u
*Diptera sp. (pupa)	6	s	u
*Oligochaeta sp. (egg capsule)	3	-	u
*Coleoptera sp. (larva)	2	-	u
*Aranae sp.	2	-	u
*Cladocera sp. S (ephippium)	1	-	oa-w
*Heteroptera sp. (nymph)	1	-	u
*Bibionidae sp.	1	-	u
*Pulex irritans	1	-	ss
*Elateridae sp. (larva)	1	-	ob
*Apis mellifera	1	-	u
*Proctotrupoidea sp.	1	-	u

Context: 304 Sample: 2406/1 CA: 2406c ReM: D
Weight: 1.35 E: 2.50 F: 2.50

Notes: Entered HK 8/9/03. Two dish flot, primarily cereal bran. Remains reddened. E 1.4-4.0, mode 2.5 weak; F 1.5-4.5, mode 2.5 weak. Trend to orange-red 0-3, mode 2 weak. Recorded in flot and on filter paper; identifications limited by damage. Soft Rhynchaenus remains.

Carpelimus bilineatus	6	-	rt-sf
Lathridius minutus group	5	-	rd-st
Chaetarthria seminulum	3	-	oa-w
Coelostoma orbiculare	2	-	oa-w
Cercyon analis	2	-	rt-sf
Ptenidium sp.	2	-	rt
Gyrohypnus ?angustatus	2	-	rt-st
Aleocharinae sp. F	2	-	u
Cryptophagus sp. B	2	-	rd-sf
Ephistemus globulus	2	-	rd-sf
Plateumaris sp.	2	-	oa-d-p
Rhynchaenus ?quercus	2	-	oa-p
Saldidae sp.	1	-	oa-d
Hebrus sp.	1	-	oa-w
Delphacidae sp.	1	-	oa-p
Elaphrus cupreus	1	-	oa-d
Trechus ?rivularis	1	-	oa-d
Colymbetinae sp.	1	-	oa-w
Cercyon ?terminatus	1	-	rf-st
Cercyon sp.	1	-	u
Acritus nigricornis	1	-	rt-st
Hydraena sp.	1	-	oa-w
Acrotrichis sp.	1	-	rt
Xylodromus concinnus	1	-	rt-st
Omaliinae sp.	1	-	rt
Carpelimus sp.	1	-	u
Anotylus rugosus	1	-	rt
Oxytelinae sp.	1	-	u
Stenus sp.	1	-	u
Philonthus sp. A	1	-	u
Philonthus sp. B	1	-	u
Philonthus sp. C	1	-	u
Quedius sp.	1	-	u
Staphylininae sp. A	1	-	u
Staphylininae sp. B	1	-	u
Falagria or Cordalia sp.	1	-	rt-sf
Aleocharinae sp. A	1	-	u
Aleocharinae sp. B	1	-	u
Aleocharinae sp. C	1	-	u
Aleocharinae sp. D	1	-	u
Aleocharinae sp. E	1	-	u
Pselaphidae sp.	1	-	u

Aphodius sp.	1	-	ob-rf
Phyllopertha horticola	1	-	oa-p
Cyphon sp.	1	-	oa-d
Byrrhidae sp.	1	-	oa-p
Cryptophagus sp. A	1	-	rd-sf
Atomaria sp. A	1	-	rd
Atomaria sp. B	1	-	rd
Cerylon ferrugineum	1	-	l
Orthoperus sp.	1	-	rt
Corticaria elongata	1	-	rt-sf
Corticaria sp. A	1	-	rt-sf
Corticaria sp. B	1	-	rt-sf
Corticaria sp. C	1	-	rt-sf
Chrysomelinae sp.	1	-	oa-p
Chaetocnema arida group	1	-	oa-p
Apion sp.	1	-	oa-p
Curculionidae sp.	1	-	oa
*Acarina sp.	15	m	u
*Diptera sp. (puparium)	6	s	u
*Coleoptera sp. (larva)	2	-	u
*Formicidae sp.	2	-	u
*?Damalinia sp.	1	-	u
*Auchenorhyncha sp. (nymph)	1	-	oa-p
*Pulex irritans	1	-	ss
*Chalcidoidea sp.	1	-	u
*Hymenoptera sp.	1	-	u
*Proctotrupoidea sp.	1	-	u
*Aranae sp.	1	-	u

Context: 305 Sample: 2404/1 CA: 2404c ReM: D
Weight: 3.00 E: 1.50 F: 2.50

Notes: Entered HK 9/9/03. Flot 1.5 cm in jar, bran, herbaceous debris, ?straw, fern fragments. Recorded in flot and on filter paper. Some superb preservation: attached mouthparts, many hairs and setae (e.g. on saldid wing); however, some very fragmented. Difficult to sort. Some bristles or feather sheaths. E 1.0-3.0, mode 1.5 weak; F 1.0-5.0, mode 2.5 weak.

Lathridius minutus group	22	-	rd-st
Cercyon analis	6	-	rt-sf
Cryptophagus sp. A	6	-	rd-sf
Aleocharinae sp. C	5	-	u
Ptenidium sp.	4	-	rt
Philonthus sp. C	4	-	u
Ephistemus globulus	4	-	rd-sf
Xylodromus concinnus	3	-	rt-st
Corticaria sp. B	3	-	rt-sf
Phymatodes testaceus	3	-	l
Pycnoglypta lurida	2	-	rt
Carpelimus ?bilineatus	2	-	rt-sf
Philonthus sp. A	2	-	u
Aleocharinae sp. A	2	-	u
Aleocharinae sp. B	2	-	u
Ptinus raptor	2	-	rd-sf
Saldidae sp.	1	-	oa-d
Corixidae sp.	1	-	oa-w
Philaenus spumarius	1	-	oa-p
Cicadellidae sp.	1	-	oa-p
Harpalus rufipes	1	-	oa
Carabidae sp.	1	-	ob
Cercyon atricapillus	1	-	rf-st
Cercyon terminatus	1	-	rf-st
Cercyon unipunctatus	1	-	rf-st
Megasternum obscurum	1	-	rt
Chaetarthria seminulum	1	-	oa-w
Acrotrichis sp. A	1	-	rt
Acrotrichis sp. B	1	-	rt
Ptiliidae sp.	1	-	u
Catops sp.	1	-	u
Omalium sp.	1	-	rt
Stenus sp.	1	-	u
Gyrohypnus fracticornis	1	-	rt-st
Philonthus sp. B	1	-	u
Quedius cinctus	1	-	rt
Quedius sp.	1	-	u
Falagria or Cordalia sp.	1	-	rt-sf
Aleocharinae sp. D	1	-	u
Geotrupes sp.	1	-	oa-rf
Aphodius sp.	1	-	ob-rf
Phyllopertha horticola	1	-	oa-p
Cyphon padi	1	-	oa-d
Lyctus linearis	1	-	l-sf
Monotoma sp.	1	-	rt-sf
Cryptophagus scutellatus	1	-	rd-st
Atomaria sp. A	1	-	rd
Atomaria sp. B	1	-	rd
Orthoperus sp. A	1	-	rt
Orthoperus sp. B	1	-	rt
Corticaria sp. A	1	-	rt-sf
Bruchus rufimanus	1	-	st
Apion (Oxystoma) sp.	1	-	oa-p
Apion sp. A	1	-	oa-p
Apion sp. B	1	-	oa-p
Strophosomus sp.	1	-	oa-p
Hypera sp.	1	-	oa-p
Gymnetron labile	1	-	oa-p
Scolytus sp.	1	-	l
*Diptera sp. (puparium)	15	m	u
*Acarina sp.	15	m	u
*Aranae sp.	10	e	u
*Diptera sp. (adult)	6	s	u
*Coleoptera sp. (larva)	6	s	u
*Hymenoptera Parasitica sp.	6	s	u
*Pediculus humanus	2	-	ss
*Pulex irritans	2	-	ss
*Formicidae sp.	2	-	u
*?Apis mellifera	1	-	u
*Chalcidoidea sp.	1	-	u
*Hymenoptera sp.	1	-	u
*Insecta sp.	1	-	u

Context: 338 Sample: 2501/1 CA: 2501c ReM: D
Weight: 3.00 E: 2.50 F: 4.00

Notes: Entered HK 9/9/03. One-dish flot, woody plant detritus. Recorded in flot and on filter paper. E 2.0-4.0, mode 2.5 weak; F 2.0-4.5, mode 4.0 weak; trend to yellow-orange 0-3, no obvious mode. Apion crumpled pale elytron.

Lathridius minutus group	5	-	rd-st
Cryptophagus sp.	3	-	rd-sf
Ptinus raptor	2	-	rd-sf
Orthoperus sp.	2	-	rt
Empicoris sp.	1	-	u
Cicadellidae sp.	1	-	oa-p
?Tachys sp.	1	-	oa
Pterostichus nigrita	1	-	oa-d
Cercyon analis	1	-	rt-sf
Cercyon ?tristis	1	-	oa-d
Acritus nigricornis	1	-	rt-st
Hydraena sp.	1	-	oa-w
Ptenidium sp.	1	-	rt
Scydmaenidae sp.	1	-	u
Lesteva sp.	1	-	oa-d
Carpelimus ?bilineatus	1	-	rt-sf
Platystethus arenarius	1	-	rf
Anotylus nitidulus	1	-	rt
Stenus sp.	1	-	u
Ochthephilum sp.	1	-	oa-d
Gyrohypnus ?fracticornis	1	-	rt-st
Staphylininae sp.	1	-	u
Falagria or Cordalia sp.	1	-	rt-sf
Aleocharinae sp.	1	-	u
Pselaphidae sp.	1	-	u
Geotrupes sp.	1	-	oa-rf
Aphodius villosus	1	-	oa-p
Aphodius sp. A	1	-	ob-rf
Aphodius sp. B	1	-	ob-rf
?Phyllopertha horticola	1	-	oa-p
Scirtidae sp.	1	-	oa-d
Rhizophagus sp.	1	-	u
Atomaria sp.	1	-	rd
Corticaria sp.	1	-	rt-sf
Anthicus floralis or formicarius	1	-	rt-st
Halticinae sp.	1	-	oa-p
Apion sp.	1	-	oa-p
Micrelus ericae	1	-	oa-p-m
Curculionidae sp.	1	-	oa
*Acarina sp.	15	m	u
*Oligochaeta sp. (egg capsule)	6	s	u
*Coccoidea sp.	2	-	u
*Diptera sp. (adult)	2	-	u
*Diptera sp. (puparium)	1	-	u
*Formicidae sp.	1	-	u
*Hymenoptera Parasitica sp.	1	-	u

Context: 342 Sample: 2528/1 CA: 2528h ReM: D
Weight: 1.00 E: 0.00 F: 0.00

Notes: Entered HK 9/9/03. Very small flot; recorded in flot and on filter paper. Too few remains for full preservation record: E 2.5-4.0; F 1.5-5.0. Remains left in flot.

Ulopa ?reticulata	1	-	oa-p-m
Tachys sp.	1	-	oa
Othius sp.	1	-	rt
Tachinus laticollis or marginellus	1	-	u
Phyllopertha horticola	1	-	oa-p
Elateridae sp.	1	-	ob
*Acarina sp.	6	s	u
*Coccoidea sp.	3	-	u
*Diptera sp. (puparium)	1	-	u
*Aranae sp.	1	-	u

Context: 349 Sample: 2552/1 CA: 2552h ReM: D
Weight: 3.00 E: 3.00 F: 0.00

Notes: Entered HK 11/9/03. Flot very small. Recorded in flot. E 2.5-4.0, mode 3.0 weak; F 2.0-3.5, no clear mode. Some remains listed but left in flot. Little difference from much smaller /T!

Lygaeidae sp.	1	-	oa-p
Psylloidea sp.	1	-	oa-p
Staphylininae sp.	1	-	u
Cordalia obscura	1	-	rt-sf
Geotrupes sp.	1	-	oa-rf
Aphodius sp.	1	-	ob-rf
Phyllopertha horticola	1	-	oa-p
Cantharidae sp.	1	-	ob
Ceutorhynchus sp.	1	-	oa-p
*Acarina sp.	15	m	u
*Diptera sp. (puparium)	2	-	u
*Formicidae sp.	2	-	u
*Insecta sp. (larva)	1	-	u

Context: 349 Sample: 2593/1 CA: 2593h ReM: D
Weight: 2.70 E: 0.00 F: 0.00

Notes: Entered HK 20/8/03. Recorded in flot, not all remains picked out. Minute flot. E 2.0-5.5, F 1.0-5.5, no obvious modes. Some very decayed beetle scraps beyond. identification and some of those listed were just scraps; most fossils perhaps had completely decayed.

Aphodius sp.	1	-	ob-rf
Phyllopertha horticola	1	-	oa-p
Hypera sp.	1	-	oa-p
Curculionidae sp.	1	-	oa
Coleoptera sp. A	1	-	u

Coleoptera sp. B	1	-	u
Coleoptera sp. C	1	-	u
*Acarina sp.	6	s	u
*Coleoptera sp. (larva)	1	-	u
*Formicidae sp.	1	-	u
*Hymenoptera sp.	1	-	u

Context: 365 Sample: 2596/1 CA: 2596h ReM: D
Weight: 1.60 E: 2.00 F: 2.00

Notes: Entered HK 11/9/03. <1 dish flot, primarily woody plant fragments. Recorded in flot and on filter paper. Could not record preservation fully. Daphnia well-decayed.

Helophorus sp.	1	-	oa-w
Hydraena sp.	1	-	oa-w
Staphylininae sp.	1	-	u
Falagria caesa or sulcatula	1	-	rt-sf
Cryptophagus sp.	1	-	rd-sf
Lathridius minutus group	1	-	rd-st
Chrysomelinae sp.	1	-	oa-p
*Acarina sp.	3	-	u
*Oligochaeta sp. (egg capsule)	2	-	u
*Daphnia sp. (ephippium)	1	-	oa-w
*Diptera sp. (pupa)	1	-	u
*Insecta sp. (larval case)	1	-	u

Context: 400 Sample: 2755/1 CA: 2755c ReM: RS
Weight: 3.00 E: 2.00 F: 2.00

Notes: Entered HK 11/9/03. Preservation quite good on the whole. Could many of these remains have been imported in moss? Worth recording if time, though not essential.

Chaetarthria seminulum	3	-	oa-w
Hebrus sp.	2	-	oa-w
Pterostichus sp.	2	-	ob
Saldidae sp.	1	-	oa-d
Cicadellidae sp.	1	-	oa-p
Delphacidae sp.	1	-	oa-p
Notiophilus sp.	1	-	oa
Coelostoma orbiculare	1	-	oa-w
Hydraena sp.	1	-	oa-w
Anthobium sp.	1	-	oa
Olophrum sp.	1	-	oa
Acidota sp.	1	-	oa
Carpelimus ?bilineatus	1	-	rt-sf
Platystethus cornutus group	1	-	oa-d
Stenus sp.	1	-	u
Rugilus orbiculatus	1	-	rt-sf
Xantholinus sp.	1	-	u
Philonthus sp.	1	-	u
Aleocharinae sp.	1	-	u
Phyllopertha horticola	1	-	oa-p
Cryptophagus sp.	1	-	rd-sf
Orthoperus sp.	1	-	rt
Lathridius minutus group	1	-	rd-st
Plateumaris sp.	1	-	oa-d-p
Apion sp.	1	-	oa-p
Limnobaris ?pilistriata	1	-	oa-p-d
Curculionidae sp.	1	-	oa
*Acarina sp.	15	m	u
*Elateridae sp. (larva)	2	-	ob
*Pulex irritans	1	-	ss

Context: 406 Sample: 2819/1 CA: 2819C ReM: D
Weight: 2.80 E: 2.50 F: 2.50

Notes: Entered HK 15/8/03. Flot two dishes, woody and herbaceous detritus. Recorded in flot and on filter paper. E 2.0-3.0, mode 2.5 weak; F 1.5-3.5, mode 2.5 weak. Both Apion include unexpanded/pale remains; ?Sitona also pale and soft.

Cercyon analis	6	-	rt-sf
Cryptophagus sp. B	4	-	rd-sf
Xylodromus ?concinnus	3	-	rt-st
Carpelimus bilineatus	2	-	rt-sf
Anotylus rugosus	2	-	rt
Philonthus sp. A	2	-	u
Falagria sp.	2	-	rt-sf
Aleocharinae sp. A	2	-	u
Cryptophagus sp. C	2	-	rd-sf
Atomaria sp. B	2	-	rd
Ephistemus globulus	2	-	rd-sf
Lathridius minutus group	2	-	rd-st
Drymus brunneus	1	-	oa-p
?Pterostichus sp.	1	-	ob
Ptenidium sp.	1	-	rt
Pycnoglypta lurida	1	-	rt
Carpelimus ?rivularis	1	-	ob-d
Platystethus arenarius	1	-	rf
Stenus sp.	1	-	u
Philonthus sp. B	1	-	u
Quedius sp.	1	-	u
Aleocharinae sp. B	1	-	u
Geotrupes sp.	1	-	oa-rf
Aphodius sp.	1	-	ob-rf
Ptinus raptor	1	-	rd-sf
Monotoma picipes	1	-	rt-st
Cryptophagus sp. A	1	-	rd-sf
Atomaria sp. A	1	-	rd
Corticaria sp.	1	-	rt-sf
Bruchidae sp.	1	-	u
Apion sp. A	1	-	oa-p
Apion sp. B	1	-	oa-p
?Sitona sp.	1	-	oa-p
Ceuthorhynchinae sp.	1	-	oa-p
Curculionidae sp.	1	-	oa

*Diptera sp. (puparium)	6	s	u
*Acarina sp.	6	s	u
*Cladocera sp. F (ephippium)	1	-	oa-w
*Forficula sp.	1	-	u
*Auchenorhyncha sp. (nymph)	1	-	oa-p
*Diptera sp. (adult)	1	-	u
*Diptera sp. (pupa)	1	-	u
*Coleoptera sp. (larva)	1	-	u
*Proctotrupoidea sp.	1	-	u
*Aranae sp.	1	-	u

Context: 426 Sample: 3008/1 CA: 3008h ReM: D
Weight: 3.00 E: 3.00 F: 2.50

Notes: Entered HK 11/9/03. Four-dish flot, fibrous plant debris and puparia. Recorded in flot and on filter paper. Some remains very fragmented, mainly outdoor forms; hence limited identifications (some fragmented beyond naming). E 1.5-3.5, mode 3.0 weak; F 2.0-5.5., mode 2.5 weak. One Apion elytral fragment pale.

Lathridius minutus group	7	-	rd-st
Cercyon analis	5	-	rt-sf
Oxytelus sculptus	4	-	rt-st
Carpelimus bilineatus	3	-	rt-sf
Saldula sp.	2	-	oa-d
Xylodromus concinnus	2	-	rt-st
Platystethus arenarius	2	-	rf
Gyrohypnus fracticornis	2	-	rt-st
Quedius cinctus	2	-	rt
Aleocharinae sp. B	2	-	u
Ptinus raptor	2	-	rd-sf
Cryptophagus sp. A	2	-	rd-sf
Atomaria sp. B	2	-	rd
Ephistemus globulus	2	-	rd-sf
Plateumaris sp.	2	-	oa-d-p
Corixidae sp.	1	-	oa-w
Aphrophora sp.	1	-	oa-p
Ulopa ?reticulata	1	-	oa-p-m
Cicadellidae sp.	1	-	oa-p
Craspedolepta sp.	1	-	oa-p
Trechus sp.	1	-	ob
Laemostenus terricola	1	-	ss
Coelostoma orbiculare	1	-	oa-w
Cercyon haemorrhoidalis	1	-	rf-sf
Cercyon ustulatus	1	-	oa-d
Megasternum obscurum	1	-	rt
Cryptopleurum minutum	1	-	rf-st
Ochthebius sp.	1	-	oa-w
Ptenidium sp.	1	-	rt
Acrotrichis sp.	1	-	rt
Omalium sp.	1	-	rt
Anotylus rugosus	1	-	rt
Rugilus ?orbiculatus	1	-	rt-sf
Paederinae sp.	1	-	u
Philonthus sp. A	1	-	u
Philonthus sp. B	1	-	u
Philonthus sp. C	1	-	u
Philonthus sp. D	1	-	u
Tachinus signatus	1	-	u
Cordalia obscura	1	-	rt-sf
Falagria sp.	1	-	rt-sf
Crataraea suturalis	1	-	rt-st
Aleocharinae sp. A	1	-	u
Aleocharinae sp. C	1	-	u
Geotrupes sp.	1	-	oa-rf
Aphodius prodromus	1	-	ob-rf
Aphodius sp. A	1	-	ob-rf
Aphodius sp. B	1	-	ob-rf
Phyllopertha horticola	1	-	oa-p
Cyphon sp.	1	-	oa-d
Cryptophagus sp. B	1	-	rd-sf
Atomaria sp. A	1	-	rd
Atomaria sp. C	1	-	rd
Orthoperus sp.	1	-	rt
Corticaria sp.	1	-	rt-sf
Chrysomelinae sp.	1	-	oa-p
Galerucella sp.	1	-	oa-p
Brachytarsus ?nebulosus	1	-	oa
Apion sp. A	1	-	oa-p
Apion sp. B	1	-	oa-p
?Strophosomus sp.	1	-	oa-p
Sitona sp.	1	-	oa-p
Limnobaris ?pilistriata	1	-	oa-p-d
Gymnetron labile	1	-	oa-p
Scolytus rugulosus	1	-	l
*Diptera sp. (puparium)	100	e	u
*Acarina sp.	15	m	u
*Auchenorhyncha sp. (nymph)	3	-	oa-p
*Pulex irritans	3	-	ss
*Psylloidea sp. (nymph)	2	-	oa-p
*Diptera sp. (adult)	2	-	u
*Chalcidoidea sp.	2	-	u
*Formicidae sp.	2	-	u
*Pentatomidae sp. (nymph)	1	-	oa-p
*Aphidoidea sp.	1	-	u
*Coccoidea sp.	1	-	u
*Lepidoptera sp. (pupa)	1	-	u
*Chironomidae sp. (larva)	1	-	w
*?Denticollis linearis (larva)	1	-	u
*Coleoptera sp. (larva)	1	-	u
*?Apis mellifera	1	-	u
*Hymenoptera Parasitica sp.	1	-	u

Context: 480 Sample: 3184/1 CA: 3184h ReM: D
Weight: 3.00 E: 2.50 F: 2.50

Notes: Entered by HK, 11/9/03. Flot about one dish, mainly plant debris. Recorded in flot and on filter paper. Quite a lot of small fragments, limiting identifications. E 2.0-3.5, mode 2.5 weak; F 2.0-4.5, mode 2.5 weak. Stenus B well decayed.

Lathridius minutus group	5	-	rd-st
Cercyon analis	3	-	rt-sf
Aleocharinae sp. E	3	-	u
Cryptophagus sp. B	3	-	rd-sf
Phymatodes testaceus	3	-	l
Limnobaris pilistriata	3	-	oa-p-d
Pterostichus sp.	2	-	ob
Xylodromus ?concinnus	2	-	rt-st
Anotylus rugosus	2	-	rt
Aleocharinae sp. B	2	-	u
Aleocharinae sp. C	2	-	u
Cryptophagus sp. A	2	-	rd-sf
Corticaria sp. B	2	-	rt-sf
Corticaria sp. C	2	-	rt-sf
Plateumaris ?affinis	2	-	oa-d-p
Apion sp. A	2	-	oa-p
Apion sp. B	2	-	oa-p
Aphrodes flavostriatus	1	-	oa-p-d
Elaphrus cupreus	1	-	oa-d
Dyschirius ?globosus	1	-	oa
Carabidae sp.	1	-	ob
Helophorus sp.	1	-	oa-w
Cercyon haemorrhoidalis	1	-	rf-sf
Cercyon tristis	1	-	oa-d
Hydrobius fuscipes	1	-	oa-w
Pycnoglypta lurida	1	-	rt
Omalium excavatum	1	-	rt-sf
Anotylus nitidulus	1	-	rt
Oxytelus sculptus	1	-	rt-st
Stenus sp. A	1	-	u
Stenus sp. B	1	-	u
?Lithocharis sp.	1	-	rt
Gyrohypnus fracticornis	1	-	rt-st
Xantholinus longiventris	1	-	rt-sf
Quedius cinctus	1	-	rt
Staphylininae sp. A	1	-	u
Staphylininae sp. B	1	-	u
Aleocharinae sp. A	1	-	u
Aleocharinae sp. D	1	-	u
Aphodius villosus	1	-	oa-p
Aphodius sp.	1	-	ob-rf
Phyllopertha horticola	1	-	oa-p
?Ptilinus pectinicornis	1	-	l-sf
Ptinus sp.	1	-	rd-sf
Brachypterus sp.	1	-	oa-p
Rhizophagus sp.	1	-	u
Corticaria sp. A	1	-	rt-sf
Salpingus sp.	1	-	l
Prasocuris phellandrii	1	-	oa-p-d
Phyllobius sp.	1	-	oa-p
Sitona ?lepidus	1	-	oa-p
*Acarina sp.	15	m	u
*Auchenorhyncha sp. (nymph)	6	s	oa-p
*Diptera sp. (pupa)	6	s	u
*Coleoptera sp. (larva)	6	s	u
*Oligochaeta sp. (egg capsule)	3	-	u
*Diptera sp. (puparium)	3	-	u
*Aranae sp.	3	-	u
*Diptera sp. (adult)	2	-	u
*Mallophaga sp.	1	-	u
*Coccoidea sp.	1	-	u
*Bibionidae sp.	1	-	u
*Melanotus erythropus (larva)	1	-	l
*?Apis mellifera	1	-	u
*Formicidae sp.	1	-	u
*Hymenoptera Parasitica sp.	1	-	u
*Proctotrupoidea sp.	1	-	u

Context: 515 Sample: 3367/1 CA: 3367c ReM: D
Weight: 3.00 E: 2.00 F: 2.50

Notes: Entered HK 11/9/03. Recorded in flot and on filter paper. E 1.5-3.0, mode 2.0 weak; F 1.5-4.0, mode 2.5 weak.

Coelostoma orbiculare	2	-	oa-w
Chaetarthria seminulum	2	-	oa-w
Saldidae sp.	1	-	oa-d
Delphacidae sp. A	1	-	oa-p
Delphacidae sp. B	1	-	oa-p
Pterostichus sp.	1	-	ob
Cercyon tristis	1	-	oa-d
Acritus nigricornis	1	-	rt-st
Carpelimus sp.	1	-	u
Platystethus cornutus group	1	-	oa-d
Stenus sp.	1	-	u
Othius sp.	1	-	rt
?Leptacinus sp.	1	-	rt-st
Philonthus sp.	1	-	u
Aleocharinae sp.	1	-	u
Geotrupes sp.	1	-	oa-rf
Aphodius sp.	1	-	ob-rf
Phyllopertha horticola	1	-	oa-p
Simplocaria sp.	1	-	oa-p
Brachypterus sp.	1	-	oa-p
Lathridius minutus group	1	-	rd-st
Donaciinae sp.	1	-	oa-d-p
?Altica sp.	1	-	oa-p
Curculionidae sp.	1	-	oa
Scolytus rugulosus	1	-	l
*Acarina sp.	15	m	u
*?Actenicerus sjaelandicus (larva)	4	-	oa
*Coleoptera sp. (larva)	3	-	u
*Formicidae sp.	3	-	u
*Oligochaeta sp. (egg capsule)	2	-	u
*Diptera sp. (puparium)	2	-	u
*Trichoptera sp. (case)	1	-	oa-w
*Auchenorhyncha sp. (nymph)	1	-	oa-p
*Chalcidoidea sp.	1	-	u
*Hymenoptera Parasitica sp.	1	-	u
*Hymenoptera sp.	1	-	u

Context: 515 Sample: 3370/1 CA: 3370w ReM: D
Weight: 0.30 E: 2.00 F: 3.00

Notes: Entered HK 11/9/03. Flot quite large, with moss and plant fibres. Recorded in flot and on filter paper. Different from /T flot. E 1.5-3.0, mode 2.0 weak; F 1.5-5.0, mode 3.0 weak.

Chaetocnema arida group	2	-	oa-p
Carabidae sp.	1	-	ob
Cercyon tristis	1	-	oa-d
Ptenidium sp.	1	-	rt
Stenus sp.	1	-	u
Philonthus sp.	1	-	u
Tachinus sp.	1	-	u
Geotrupes sp.	1	-	oa-rf
Aphodius sp. A	1	-	ob-rf
Aphodius sp. B	1	-	ob-rf
Phyllopertha horticola	1	-	oa-p
Corticaria sp.	1	-	rt-sf
?Plateumaris sp.	1	-	oa-d-p
Sitona sp.	1	-	oa-p
*Oligochaeta sp. (egg capsule)	6	s	u
*Diptera sp. (puparium)	6	s	u
*Acarina sp.	6	s	u
*Coleoptera sp. (larva)	3	-	u
*Diptera sp. (pupa)	1	-	u
*Formicidae sp.	1	-	u
*Hymenoptera Parasitica sp.	1	-	u
*Hymenoptera sp.	1	-	u
*Aranae sp.	1	-	u

Context: 521 Sample: 3390/1 CA: 3390h ReM: RS
Weight: 1.50 E: 2.00 F: 2.50

Notes: Entered 11/9/03. Flot about six dishes, plant fibres and seeds. Recorded in flot. E 1.5-3.0, mode 2.0 weak; F 1.5-4.0, mode 2.5 weak. Modest-sized but distinctive group of insects: record if time. Various small fragments not listed but probably could be named.

Hebrus sp.	6	s	oa-w
Chaetarthria seminulum	6	s	oa-w
Saldidae sp.	2	-	oa-d
Drymus ?brunneus	1	-	oa-p
Delphacidae sp. A	1	-	oa-p
Delphacidae sp. B	1	-	oa-p
Delphacidae sp. C	1	-	oa-p
Psylloidea sp.	1	-	oa-p
Sphaerius acaroides	1	-	u
Pterostichus (Poecilus) sp.	1	-	oa
Carabidae sp. A	1	-	ob
Carabidae sp. B	1	-	ob
Helophorus aquaticus or grandis	1	-	oa-w
Coelostoma orbiculare	1	-	oa-w
Cercyon ?haemorrhoidalis	1	-	rf-sf
Cercyon ?tristis	1	-	oa-d
Cryptopleurum minutum	1	-	rf-st
Omaliinae sp.	1	-	rt
Stenus sp. A	1	-	u
Stenus sp. B	1	-	u
Lathrobium sp.	1	-	u
?Neobisnius sp.	1	-	u
Philonthus sp.	1	-	u
Staphylininae sp.	1	-	u
Phyllopertha horticola	1	-	oa-p
Dryops sp.	1	-	oa-d
Ptinus sp.	1	-	rd-sf
?Kateretes sp.	1	-	oa-p-d
Cryptophagus sp.	1	-	rd-sf
Lathridius minutus group	1	-	rd-st
Plateumaris sp.	1	-	oa-d-p
Phaedon sp.	1	-	oa-p
Halticinae sp.	1	-	oa-p
Apion sp.	1	-	oa-p
Coleoptera sp.	1	-	u
Coleoptera sp. B	1	-	u
*Trichoptera sp. (case)	6	s	oa-w
*Coleoptera sp. (larva)	6	s	u
*Insecta sp. (immature)	6	s	u
*Diptera sp. (puparium)	3	-	u
*Oligochaeta sp. (egg capsule)	2	-	u
*Diptera sp. (adult)	1	-	u
*Formicidae sp.	1	-	u
*Aranae sp.	1	-	u

Context: 532 Sample: 3519/1 CA: 3510h ReM: RS
Weight: 1.90 E: 2.00 F: 2.50

Notes: Entered HK 11/9/03. Two-dish flot, abundant seeds and invertebrate remains. Recorded in flot. Quite a lot of fragmented sclerites. Primarily outdoor fauna, probably from marshy area. Very few synanthropes. Record if time. E 2.0-3.0, mode 2.0 weak; F 1.5-4.0, mode 2.5 weak.

Limnobaris pilistriata	3	-	oa-p-d
Pterostichus ?nigrita	2	-	oa-d
Chaetarthria seminulum	2	-	oa-w
Saldidae sp.	1	-	oa-d
Delphacidae sp. A	1	-	oa-p
Delphacidae sp. B	1	-	oa-p
Delphacidae sp. C	1	-	oa-p
Bembidion sp.	1	-	oa
Agonum sp.	1	-	oa
Dytiscidae sp.	1	-	oa-w
Helophorus aquaticus or grandis	1	-	oa-w
Helophorus sp.	1	-	oa-w
Coelostoma orbiculare	1	-	oa-w
Cercyon ?analis	1	-	rt-sf

Ochthebius sp.	1	-	oa-w
Hydraena sp.	1	-	oa-w
Xylodromus ?concinnus	1	-	rt-st
Platystethus arenarius	1	-	rf
Stenus sp. A	1	-	u
Stenus sp. B	1	-	u
Lathrobium sp.	1	-	u
Othius sp.	1	-	rt
Philonthus sp.	1	-	u
Quedius sp.	1	-	u
Aleocharinae sp. A	1	-	u
Aleocharinae sp. B	1	-	u
Geotrupes sp.	1	-	oa-rf
Aphodius sp.	1	-	ob-rf
Phyllopertha horticola	1	-	oa-p
?Melolonthinae/Rutelinae/Cetoninae sp.	1	n	oa-p
Lathridius minutus group	1	-	rd-st
Corticarina or Cortinicara sp.	1	-	rt
Plateumaris sp.	1	-	oa-d-p
Psylliodes sp.	1	-	oa-p
Apion sp.	1	-	oa-p
Hypera sp.	1	-	oa-p
?Phytobius sp.	1	-	oa-d
?Gymnetron sp.	1	-	oa-p
*Acarina sp.	15	m	u
*Trichoptera sp. (case)	6	s	oa-w
*Insecta sp. (immature)	6	s	u
*Heteroptera sp. (nymph)	1	-	u
*Diptera sp. (puparium)	1	-	u
*Bibionidae sp.	1	-	u
*Formicidae sp.	1	-	u

Context: 143 Sample: 143/T ReM: RS
Weight: 1.00 E: 2.50 F: 2.50

Notes: Entered HK 12/11/02. Assessment record made in flot, entered as RS. Flot 5 mm in jar, woody and herbaceous debris, abundant seeds, conspicuous numbers of insect fragments. E 2.0-3.5, mode 2.5 weak; F 2.0-3.0, mode 2.5 weak.

Cercyon analis	2	-	rt-sf
Carpelimus sp.	2	-	u
Anotylus nitidulus	2	-	rt
Falagria sp.	2	-	rt-sf
Cryptophagus sp.	2	-	rd-sf
Lathridius minutus group	2	-	rd-st
?Heterogaster urticae	1	-	oa-p
Cicadellidae sp.	1	-	oa-p
Dyschirius sp.	1	-	oa
Carabidae sp.	1	-	ob
Helophorus ?aquaticus	1	-	oa-w
Helophorus sp.	1	-	oa-w
Cercyon convexiusculus group	1	-	oa-d
Hydrobius fuscipes	1	-	oa-w
Coprophilus striatulus	1	-	rt-st
Carpelimus bilineatus or rivularis	1	-	u
Carpelimus sp. B	1	-	u
Platystethus ?nitens	1	-	oa-d
Anotylus rugosus	1	-	rt
Stenus sp.	1	-	u
Othius sp.	1	-	rt
Leptacinus sp.	1	-	rt-st
Philonthus sp. A	1	-	u
Philonthus sp. B	1	-	u
Philonthus sp. C	1	-	u
Cordalia obscura	1	-	rt-sf
Aleocharinae sp. A	1	-	u
Aleocharinae sp. B	1	-	u
Aphodius sp. A	1	-	ob-rf
Aphodius sp. B	1	-	ob-rf
Aphodius sp. C	1	-	ob-rf
Atomaria sp.	1	-	rd
Corticaria sp.	1	-	rt-sf
Ceuthorhynchinae sp.	1	-	oa-p
Coleoptera sp.	1	-	u
*Diptera sp. (puparium)	15	m	u
*Acarina sp.	15	m	u
*Coleoptera sp. (larva)	6	s	u
*Auchenorhyncha sp. (nymph)	2	-	oa-p
*Aphidoidea sp.	2	-	u
*Bibionidae sp.	1	-	u
*Hymenoptera Parasitica sp.	1	-	u
*Hymenoptera sp.	1	-	u

Context: 185 Sample: 185/T ReM: RS
Weight: 1.00 E: 2.00 F: 2.50

Notes: Entered HK 12/11/02. Assessment record made in flot, entered as RS. Flot 10 mm in jar, mostly woody fragments, many seeds and some charcoal.

Cercyon analis	2	-	rt-sf
Philonthus sp.	2	-	u
Atomaria sp.	2	-	rd
Lathridius minutus group	2	-	rd-st
Cercyon ?atricapillus	1	-	rf-st
Carpelimus sp.	1	-	u
Carpelimus sp. B	1	-	u
Platystethus arenarius	1	-	rf
Anotylus nitidulus	1	-	rt
Oxytelus sculptus	1	-	rt-st
?Othius sp.	1	-	rt
Falagria sp.	1	-	rt-sf
Aleocharinae sp.	1	-	u
Aphodius sp.	1	-	ob-rf
Phyllopertha horticola	1	-	oa-p
Cryptophagus sp.	1	-	rd-sf
Corticaria sp.	1	-	rt-sf
Corticarina or Cortinicara sp.	1	-	rt
?Anthicus sp.	1	-	rt
?Cerambycidae sp.	1	-	l
*Diptera sp. (puparium)	15	m	u

*Acarina sp.	15	m	u
*Diptera sp. (pupa)	2	-	u
*Pediculus humanus	1	-	ss
*Auchenorhyncha sp. (nymph)	1	-	oa-p
*Diptera sp. (adult)	1	-	u
*Syrphidae sp. (larva)	1	-	u
*Elateridae sp. (larva)	1	-	ob
*Coleoptera sp. (larva)	1	-	u
*Apoidea sp.	1	-	u
*Hymenoptera Parasitica sp.	1	-	u
*Insecta sp. (larva)	1	-	u

Context: 188 Sample: 188/T ReM: RS
Weight: 1.00 E: 2.00 F: 2.50

Notes: Entered HK 12/11/02. Assessment record made in flot, entered as RS. Flot 8 mm in jar, herbaceous debris with some seeds. E 1.5-2.5, mode 2.0 weak; F 1.0-3.0, mode 2.5 weak (preservation mostly good).

Cercyon analis	6	s	rt-sf
Carpelimus bilineatus or rivularis	6	s	u
Oxytelus sculptus	6	s	rt-st
Gyrohypnus fracticornis	3	-	rt-st
Ptenidium sp.	2	-	rt
Philonthus sp. B	2	-	u
Cryptophagus sp.	2	-	rd-sf
?Ephistemus globulus	2	-	rd-sf
Lathridius minutus group	2	-	rd-st
Pterostichus sp.	1	-	ob
Carabidae sp.	1	-	ob
Colymbetinae sp.	1	-	oa-w
Cercyon haemorrhoidalis	1	-	rf-sf
Cercyon unipunctatus	1	-	rf-st
Acrotrichis sp.	1	-	rt
?Xylodromus concinnus	1	-	rt-st
Carpelimus sp.	1	-	u
Platystethus arenarius	1	-	rf
Stenus sp.	1	-	u
Philonthus sp. A	1	-	u
Cordalia obscura	1	-	rt-sf
?Crataraea suturalis	1	-	rt-st
?Pselaphidae sp.	1	-	u
Geotrupes sp.	1	-	oa-rf
Atomaria sp.	1	-	rd
Corticaria sp.	1	-	rt-sf
*Diptera sp. (puparium)	6	s	u
*Acarina sp.	6	s	u
*Coleoptera sp. (larva)	2	-	u
*Oligochaeta sp. (egg capsule)	1	-	u
*Diptera sp. (pupa)	1	-	u
*?Apis mellifera	1	-	u
*Hymenoptera sp.	1	-	u
*Proctotrupoidea sp.	1	-	u
*Aranae sp.	1	-	u

Context: 194 Sample: 194/T ReM: RS
Weight: 1.00 E: 2.50 F: 2.50

Notes: Entered HK 12/11/02. Assessment record made in flot, entered as RS. Flot of 3 dish volume, wood fragments, trace of seeds, (proportionally) abundant charcoal. E 2.0-3.0, mode 2.5 weak; F 2.0-5.0, mode 2.5, unclear.

Philonthus sp. A	1	-	u
Philonthus sp. B	1	-	u
Aleocharinae sp.	1	-	u
Aphodius sp.	1	-	ob-rf
Phyllopertha horticola	1	-	oa-p
Cerylon sp.	1	-	l
*Diptera sp. (puparium)	6	s	u
*Acarina sp.	6	s	u
*Daphnia sp. (ephippium)	1	-	oa-w
*Aranae sp.	1	-	u

Context: 218 Sample: 218/T ReM: RS
Weight: 1.00 E: 3.00 F: 2.50

Notes: Entered HK 12/11/02. Assessment record made in flot, entered as RS. Flot 15 mm in jar, assorted herbaceous and woody plant debris. E 1.5-4.0, mode 3.0 weak; F 1.5-3.0, mode 2.5 weak. Change to pale 0-2, mode 1 weak. Trox perhaps more decayed than most remains, rather pale and cracked, but not definitely so.

Trox scaber	8	-	rt-sf
Cercyon analis	3	-	rt-sf
Aleocharinae sp. A	3	-	u
Ptenidium sp.	2	-	rt
?Lesteva sp.	2	-	oa-d
Omaliinae sp. B	2	-	u
Carpelimus bilineatus or rivularis	2	-	u
Gyrohypnus fracticornis	2	-	rt-st
Philonthus sp. B	2	-	u
Atomaria sp.	2	-	rd
Carabidae sp. A	1	-	ob
Cercyon ?atricapillus	1	-	rf-st
Cercyon haemorrhoidalis	1	-	rf-sf
?Chaetarthria seminulum	1	-	oa-w
Acritus nigricornis	1	-	rt-st
Acrotrichis sp.	1	-	rt
Omaliinae sp.	1	-	rt
Carpelimus sp.	1	-	u
Platystethus arenarius	1	-	rf
Oxytelus sculptus	1	-	rt-st
Stenus sp.	1	-	u
?Othius sp.	1	-	rt
Leptacinus sp.	1	-	rt-st
Philonthus sp. A	1	-	u
Staphylininae sp.	1	-	u

Cordalia obscura	1	-	rt-sf
Aleocharinae sp. B	1	-	u
Aphodius sp. A	1	-	ob-rf
Clambus sp.	1	-	rt-sf
?Cryptophagus sp.	1	-	rd-sf
Lathridius minutus group	1	-	rd-st
Corticaria sp.	1	-	rt-sf
?Phaedon sp.	1	-	oa-p
Apion sp.	1	-	oa-p
Ceutorhynchus sp.	1	-	oa-p
*Diptera sp. (puparium)	100	e	u
*?Siphonaptera sp.	1	-	u
*Elateridae sp. (larva)	1	-	ob
*Coleoptera sp. (larva)	1	-	u
*Chalcidoidea sp.	1	-	u
*Aranae sp.	1	-	u

Context: 253 Sample: 253/T ReM: RS
Weight: 1.00 E: 3.50 F: 2.50

Notes: Entered HK 12/11/02. Assessment record made in flot, entered as RS. Flot 5 mm in jar, rather a lot of seeds. E 1.5-3.5, mode 3.5 distinct; F 2.0-4.0, mode 2.5 weak. Pale 2-3, mode 2 weak.

Lathridius minutus group	6	s	rd-st
Ptinus sp.	2	-	rd-sf
Cryptophagus sp.	2	-	rd-sf
Corticaria sp.	2	-	rt-sf
?Heterogaster urticae	1	-	oa-p
Cercyon ?analis	1	-	rt-sf
Megasternum obscurum	1	-	rt
Hydrobius fuscipes	1	-	oa-w
Xylodromus concinnus	1	-	rt-st
Coprophilus striatulus	1	-	rt-st
Carpelimus sp.	1	-	u
Anotylus rugosus	1	-	rt
Rugilus sp.	1	-	rt
Gyrohypnus sp.	1	-	rt
Aleocharinae sp.	1	-	u
Aphodius sp.	1	-	ob-rf
?Omosita sp.	1	-	rt-sf
Atomaria sp.	1	-	rd
Orthoperus sp.	1	-	rt
Halticinae sp.	1	-	oa-p
*Diptera sp. (puparium)	15	m	u
*Acarina sp.	15	m	u

Context: 257 Sample: 257/T ReM: RS
Weight: 1.00 E: 2.50 F: 2.50

Notes: Entered HK 12/11/02. Assessment record made in flot, entered as RS. Flot 6 mm in jar, mostly fragments of wood. E 1.5-3.0, mode 2.5 distinct; F 1.5-3.0, mode 2.5 distinct. Slight yellowing (trend to yellow 1).

Cryptophagus sp.	2	-	rd-sf
Corticaria sp.	2	-	rt-sf
Pterostichus melanarius	1	-	ob
Cercyon analis	1	-	rt-sf
Cercyon sp.	1	-	u
Ptenidium sp.	1	-	rt
Micropeplus sp.	1	-	rt
?Xylodromus concinnus	1	-	rt-st
Platystethus arenarius	1	-	rf
Anotylus rugosus	1	-	rt
Stenus sp.	1	-	u
Xantholinus sp.	1	-	u
Philonthus sp.	1	-	u
Falagria sp.	1	-	rt-sf
Aleocharinae sp. A	1	-	u
Aleocharinae sp. B	1	-	u
Geotrupes sp.	1	-	oa-rf
Phyllopertha horticola	1	-	oa-p
Lyctus linearis	1	-	l-sf
Atomaria sp.	1	-	rd
Lathridius minutus group	1	-	rd-st
Halticinae sp.	1	-	oa-p
Phyllobius or Polydrusus sp.	1	-	oa-p
*Diptera sp. (puparium)	50	e	u
*Coleoptera sp. (larva)	3	-	u
*Aranae sp.	2	-	u
*Hymenoptera sp.	1	-	u
*Acarina sp.	1	-	u

Context: 295 Sample: 295/T ReM: RS
Weight: 1.00 E: 0.00 F: 0.00

Notes: Entered HK 12/11/02. Assessment record made in flot, entered as RS. Small, almost trace, flot. Quite well preserved (preservation record impractical).

Cercyon sp.	1	-	u
Ptenidium sp.	1	-	rt
?Xylodromus concinnus	1	-	rt-st
Platystethus arenarius	1	-	rf
Aleocharinae sp. A	1	-	u
Aleocharinae sp. B	1	-	u
Staphylinidae sp.	1	-	u
Phyllopertha horticola	1	-	oa-p
?Cryptophagus sp.	1	-	rd-sf
*Oligochaeta sp. (egg capsule)	1	-	u
*Diptera sp. (puparium)	1	-	u
*Coleoptera sp. (larva)	1	-	u
*Hymenoptera sp.	1	-	u
*Acarina sp.	1	-	u

Context: 301 Sample: 301/T ReM: RS
Weight: 1.00 E: 2.50 F: 2.50

Notes: Entered HK 12/11/02. Assessment record made in flot, entered as RS. Flot 30 mm in jar, mostly herbaceous debris. E 1.5-3.5, mode 2.5 weak; F 1.5-3.5, mode 2.5 weak. Some strikingly good preservation.

Philonthus sp. B	3	-	u
Cicadellidae sp.	1	-	oa-p
?Pterostichus sp.	1	-	ob
Carabidae sp.	1	-	ob
Helophorus sp.	1	-	oa-w
Cercyon melanocephalus	1	-	rt-sf
Cercyon sp.	1	-	u
Ptenidium sp.	1	-	rt
Xylodromus ?concinnus	1	-	rt-st
Leptacinus sp.	1	-	rt-st
Gyrohypnus fracticornis	1	-	rt-st
Philonthus sp. A	1	-	u
Aleocharinae sp. A	1	-	u
Aleocharinae sp. B	1	-	u
Aphodius sp. A	1	-	ob-rf
Aphodius sp. B	1	-	ob-rf
Phyllopertha horticola	1	-	oa-p
Simplocaria ?semistriata	1	-	oa-p
?Cantharidae sp.	1	-	ob
Ptinus sp.	1	-	rd-sf
Cryptophagus sp.	1	-	rd-sf
Orthoperus sp.	1	-	rt
Lathridius minutus group	1	-	rd-st
?Enicmus sp.	1	-	rt-sf
Corticaria sp.	1	-	rt-sf
Apion sp.	1	-	oa-p
?Gymnetron sp.	1	-	oa-p
Scolytus sp.	1	-	l
Coleoptera sp.	1	-	u
*Diptera sp. (puparium)	100	e	u
*Acarina sp.	15	m	u
*Diptera sp. (pupa)	1	-	u
*?Apis mellifera	1	-	u
*Chalcidoidea sp.	1	-	u
*Hymenoptera Parasitica sp.	1	-	u
*Proctotrupoidea sp.	1	-	u

Context: 304 Sample: 304/T ReM: RS
Weight: 1.00 E: 3.00 F: 2.50

Notes: Entered HK 12/11/02. Assessment record made in flot, entered as RS. Flot 7 mm in jar, fine herbaceous debris - apparently bran - and trace of moss. E 2.0-4.0, mode 3.0 weak; F 1.5-4.0, mode 2.5 weak. Pale, slightly orange-brown 0-3, mode 1, weak. Some remains quite badly degraded, often fragmented.

Corixidae sp.	1	-	oa-w
Pterostichus sp.	1	-	ob
Amara sp.	1	-	oa
?Harpalus sp.	1	-	oa
Carabidae sp.	1	-	ob
Helophorus aquaticus or grandis	1	-	oa-w
Cercyon analis	1	-	rt-sf
Cryptopleurum minutum	1	-	rf-st
Chaetarthria seminulum	1	-	oa-w
Hydraena sp.	1	-	oa-w
Acrotrichis sp.	1	-	rt
?Xylodromus concinnus	1	-	rt-st
Carpelimus ?rivularis	1	-	ob-d
Carpelimus sp.	1	-	u
Anotylus nitidulus	1	-	rt
Oxytelus sculptus	1	-	rt-st
Stenus sp.	1	-	u
Lathrobium sp.	1	-	u
Leptacinus sp.	1	-	rt-st
Gyrohypnus fracticornis	1	-	rt-st
Aleocharinae sp. A	1	-	u
Aleocharinae sp. B	1	-	u
Pselaphidae sp.	1	-	u
Geotrupes sp.	1	-	oa-rf
?Phyllopertha horticola	1	-	oa-p
Cryptophagus sp.	1	-	rd-sf
Cryptophagus sp.	1	-	rd-sf
Atomaria sp.	1	-	rd
Orthoperus sp.	1	-	rt
Lathridius minutus group	1	-	rd-st
Halticinae sp.	1	-	oa-p
Rhynchaenus sp.	1	-	oa-p
Curculionidae sp.	1	-	oa
*Diptera sp. (puparium)	15	m	u
*Acarina sp.	15	m	u
*Diptera sp. (pupa)	6	s	u
*Coleoptera sp. (larva)	1	-	u
*Hymenoptera Parasitica sp.	1	-	u
*Hymenoptera sp.	1	-	u
*Aranae sp.	1	-	u

Context: 306 Sample: 306/T ReM: RS
Weight: 1.00 E: 2.50 F: 2.50

Notes: Entered HK 12/11/02. Assessment record made in flot, entered as RS. Flot 6 mm in jar, herbaceous and woody debris, some seeds. E 1.0-4.0, mode 2.5 weak; F 1.0-4.0, mode 2.5 weak. Some associated parts, delicate hairs, etc. Two crumpled, pale, Apion elytra.

Cercyon analis	6	s	rt-sf
Carpelimus bilineatus or rivularis	3	-	u
Lathridius minutus group	3	-	rd-st
Platystethus arenarius	2	-	rf
Anotylus nitidulus	2	-	rt

Gyrohypnus ?fracticornis	2	-	rt-st
Philonthus sp. A	2	-	u
Atomaria sp.	2	-	rd
Cryptopleurum minutum	1	-	rf-st
Hydrobius fuscipes	1	-	oa-w
Acritus nigricornis	1	-	rt-st
Histerinae sp.	1	-	rt
Hydraena sp.	1	-	oa-w
Acrotrichis sp.	1	-	rt
Scydmaenidae sp.	1	-	u
Platystethus cornutus group	1	-	oa-d
Oxytelus sculptus	1	-	rt-st
Leptacinus sp.	1	-	rt-st
Philonthus sp. B	1	-	u
Falagria sp.	1	-	rt-sf
Aleocharinae sp. A	1	-	u
Aleocharinae sp. B	1	-	u
Aphodius sp.	1	-	ob-rf
Phyllopertha horticola	1	-	oa-p
Elateridae sp.	1	-	ob
Lyctus linearis	1	-	l-sf
?Ephistemus globulus	1	-	rd-sf
Corticaria sp. A	1	-	rt-sf
Corticaria sp. B	1	-	rt-sf
Apion sp.	1	-	oa-p
Sitona sp.	1	-	oa-p
?Gymnetron sp.	1	-	oa-p
Curculionidae sp.	1	-	oa
Scolytidae sp.	1	-	l
*Diptera sp. (puparium)	15	m	u
*Acarina sp.	15	m	u
*Oligochaeta sp. (egg capsule)	2	-	u
*Cladocera sp. F (ephippium)	1	-	oa-w
*Aphidoidea sp.	1	-	u
*Coleoptera sp. (larva)	1	-	u
*?Apis mellifera	1	-	u
*Chalcidoidea sp.	1	-	u
*Proctotrupoidea sp.	1	-	u
*Aranae sp.	1	-	u

Context: 307 Sample: 307/T ReM: RS
Weight: 1.00 E: 0.00 F: 0.00

Notes: Entered HK 12/11/02. Assessment record made in flot, entered as RS. Flot 20 mm in jar, mostly wood fragments, with appreciable amount of herbaceous debris. E 1.0-3.5, modes 1.5 and 3.0 distinct; F 1.0-3.5, modes 1.5 and 2.5 distinct. Some remains very fresh-looking (but undoubtedly ancient). Trend to yellow 0-3, modes 1 and 3 distinct (only small proportion at 3).

Cercyon analis	6	s	rt-sf
Platystethus arenarius	3	-	rf
Philonthus sp.	3	-	u
Stenus sp.	2	-	u
Cryptophagus sp.	2	-	rd-sf
Saldidae sp.	1	-	oa-d
Elaphrus sp.	1	-	oa-d
Pterostichus sp.	1	-	ob
Carabidae sp.	1	-	ob
Megasternum obscurum	1	-	rt
Hydrobius fuscipes	1	-	oa-w
Xylodromus concinnus	1	-	rt-st
Carpelimus ?bilineatus	1	-	rt-sf
Anotylus nitidulus	1	-	rt
Oxytelus sculptus	1	-	rt-st
Rugilus sp.	1	-	rt
Gyrohypnus fracticornis	1	-	rt-st
Staphylininae sp.	1	-	u
Tachyporus sp.	1	-	u
?Crataraea suturalis	1	-	rt-st
Aleocharinae sp. A	1	-	u
Aleocharinae sp. B	1	-	u
Pselaphidae sp.	1	-	u
Geotrupes sp.	1	-	oa-rf
Ptinus sp.	1	-	rd-sf
?Omosita sp.	1	-	rt-sf
Atomaria sp.	1	-	rd
Lathridius minutus group	1	-	rd-st
Chrysomelinae sp.	1	-	oa-p
Ceuthorhynchinae sp.	1	-	oa-p
?Curculionidae sp.	1	-	oa
Curculionidae sp. A	1	-	oa
Curculionidae sp. B	1	-	oa
*Diptera sp. (pupa)	15	m	u
*Diptera sp. (puparium)	15	m	u
*Acarina sp.	15	m	u
*Aphidoidea sp.	1	-	u
*Diptera sp. (larva)	1	-	u
*Syrphidae sp. (larva)	1	-	u
*Siphonaptera sp.	1	-	u
*Coleoptera sp. (larva)	1	-	u
*Aranae sp.	1	-	u

Context: 309 Sample: 309/T ReM: RS
Weight: 1.00 E: 2.00 F: 2.50

Notes: Entered HK 12/11/02. Assessment record made in flot, entered as RS. Flot 12 mm in jar, rather coarse herbaceous debris. E 1.5-4.0, mode 2.0 weak; F 1.0-4.0, mode 2.5 weak.

Carpelimus sp.	6	s	u
Acrotrichis sp.	3	-	rt
Aphodius sp. B	3	-	ob-rf
Cercyon analis	2	-	rt-sf
Carpelimus bilineatus or rivularis	2	-	u
Delphacidae sp.	1	-	oa-p
Carabidae sp.	1	-	ob
Cercyon sp.	1	-	u
Hydraena sp.	1	-	oa-w
Catopinae sp.	1	-	u
Omaliinae sp.	1	-	rt

Platystethus arenarius	1	-	rf
Platystethus cornutus group	1	-	oa-d
Anotylus nitidulus	1	-	rt
Anotylus rugosus	1	-	rt
Oxytelus sculptus	1	-	rt-st
Stenus sp.	1	-	u
Gyrohypnus fracticornis	1	-	rt-st
?Neobisnius sp.	1	-	u
Quedius sp.	1	-	u
Aleocharinae sp. A	1	-	u
Aleocharinae sp. B	1	-	u
Geotrupes sp.	1	-	oa-rf
Aphodius sp. A	1	-	ob-rf
Phyllopertha horticola	1	-	oa-p
Cryptophagus sp.	1	-	rd-sf
Atomaria sp.	1	-	rd
?Ephistemus globulus	1	-	rd-sf
Lathridius minutus group	1	-	rd-st
Donaciinae sp.	1	-	oa-d-p
?Galerucella sp.	1	-	oa-p
?Gymnetron sp.	1	-	oa-p
Curculionidae sp. A	1	-	oa
Curculionidae sp. B	1	-	oa
*Diptera sp. (puparium)	15	m	u
*Acarina sp.	15	m	u
*Auchenorhyncha sp. (nymph)	2	-	oa-p
*Coleoptera sp. (larva)	2	-	u
*Oligochaeta sp. (egg capsule)	1	-	u
*Cladocera sp. F (ephippium)	1	-	oa-w
*Aphidoidea sp.	1	-	u
*Chalcidoidea sp.	1	-	u

Context: 342 Sample: 342/T ReM: RS
Weight: 1.00 E: 2.00 F: 2.00

Notes: Entered HK 12/11/02. Assessment record made in flot, entered as RS. Flot 1 dish. E 1.0-2.5, mode 2.0 weak; F 1.5-3.0, mode 2.0 weak (preservation hard to estimate).

Hydrobius fuscipes	1	-	oa-w
Rugilus sp.	1	-	rt
Gyrohypnus sp.	1	-	rt
?Neobisnius sp.	1	-	u
Melolonthinae/Rutelinae/Cetoninae sp.	1	-	oa-p
Ptinus sp.	1	-	rd-sf
Cryptophagus sp.	1	-	rd-sf
Apion sp.	1	-	oa-p
Coleoptera sp.	1	-	u
*Acarina sp.	6	s	u
*Oligochaeta sp. (egg capsule)	1	-	u

Context: 349 Sample: 349/T ReM: RS
Weight: 1.00 E: 0.00 F: 0.00

Notes: Entered HK 12/11/02. Assessment record made in flot, entered as RS. Trace flot. Too few remains for useful preservation record (though variable).

Cicadellidae sp.	1	-	oa-p
Carabidae sp.	1	-	ob
Gyrohypnus ?angustatus	1	-	rt-st
Aleocharinae sp.	1	-	u
Curculionidae sp.	1	-	oa
Coleoptera sp.	1	-	u
*Acarina sp.	15	m	u
*Diptera sp. (puparium)	1	-	u

Context: 365 Sample: 365/T ReM: RS
Weight: 1.00 E: 0.00 F: 0.00

Notes: Entered HK 12/11/02. Assessment record made in flot, entered as RS. Trace flot, woody fragments and a few seeds. Fairly well preserved; impractical to record preservation.

Stenus sp.	1	-	u
Aleocharinae sp. A	1	-	u
Aleocharinae sp. B	1	-	u
Chrysomelinae sp.	1	-	oa-p
Chaetocnema sp.	1	-	oa-p
Ceutorhynchus sp.	1	-	oa-p
Coleoptera sp.	1	-	u
*Acarina sp.	6	s	u
*Oligochaeta sp. (egg capsule)	3	-	u
*Diptera sp. (puparium)	2	-	u
*Coleoptera sp. (larva)	1	-	u

Context: 392 Sample: 392/T ReM: RS
Weight: 1.00 E: 2.50 F: 2.50

Notes: Entered HK 12/11/02. Assessment record made in flot, entered as RS. Flot 10 mm in jar, assorted herbaceous debris. E 2.0-3.5, mode 2.5 weak; F 1.5-3.0, mode 2.5 weak.

Carpelimus sp.	6	s	u
Gyrohypnus fracticornis	4	-	rt-st
Carpelimus ?bilineatus	3	-	rt-sf
Lathridius minutus group	3	-	rd-st
Cercyon ?analis	2	-	rt-sf
Acrotrichis sp.	2	-	rt
Neobisnius sp.	2	-	u
Atomaria sp.	2	-	rd
Apion sp.	2	-	oa-p
Carabidae sp.	1	-	ob
Cercyon ?haemorrhoidalis	1	-	rf-sf
?Cercyon sp.	1	-	u
Carpelimus sp. B	1	-	u
Platystethus arenarius	1	-	rf

Platystethus cornutus group	1	-	oa-d
Anotylus nitidulus	1	-	rt
Stenus sp.	1	-	u
Leptacinus sp.	1	-	rt-st
Gyrohypnus ?angustatus	1	-	rt-st
Aleocharinae sp. A	1	-	u
Aleocharinae sp. B	1	-	u
Aleocharinae sp. C	1	-	u
Aphodius sp. A	1	-	ob-rf
Aphodius sp. B	1	-	ob-rf
?Phyllopertha horticola	1	-	oa-p
Ptinus sp.	1	-	rd-sf
Cryptophagus sp.	1	-	rd-sf
Enicmus sp.	1	-	rt-sf
Corticaria sp.	1	-	rt-sf
Ceutorhynchus sp.	1	-	oa-p
?Gymnetron sp.	1	-	oa-p
Curculionidae sp.	1	-	oa
*Diptera sp. (puparium)	15	m	u
*Oligochaeta sp. (egg capsule)	6	s	u
*Coleoptera sp. (larva)	6	s	u
*Bibionidae sp.	3	-	u
*Hemiptera sp. (nymph)	1	-	u
*Ptiliidae sp. (pupa)	1	-	u
*Coleoptera sp. (larva)	1	-	u
*Chalcidoidea sp.	1	-	u
*Insecta sp. (pupa)	1	-	u

Context: 395 Sample: 395/T ReM: RS
Weight: 1.00 E: 2.00 F: 2.00

Notes: Entered HK 12/11/02. Assessment record made in flot, entered as RS. Flot 12 mm in jar. E 2.0-3.0, mode 2.0 weak; F 2.0-3.0, mode 2.0 weak.

Cercyon analis	2	-	rt-sf
Ptinus sp.	2	-	rd-sf
Lathridius minutus group	2	-	rd-st
Auchenorhyncha sp.	1	-	oa-p
Pterostichus sp.	1	-	ob
Anthobium sp.	1	-	oa
Omalium sp.	1	-	rt
Xylodromus concinnus	1	-	rt-st
Stenus sp.	1	-	u
?Gyrohypnus sp.	1	-	rt
Philonthus or Gabrius sp.	1	-	u
Quedius sp.	1	-	u
Aleocharinae sp. A	1	-	u
Aleocharinae sp. B	1	-	u
Geotrupes sp.	1	-	oa-rf
Aphodius sp.	1	-	ob-rf
Aphodius sp. B	1	-	ob-rf
Phyllopertha horticola	1	-	oa-p
Elateridae sp.	1	-	ob
Atomaria sp.	1	-	rd
?Ephistemus globulus	1	-	rd-sf
Corticaria sp. A	1	-	rt-sf
Corticaria sp. B	1	-	rt-sf
Corticaria sp. C	1	-	rt-sf
?Cerambycidae sp.	1	-	l
Chrysomelinae sp.	1	-	oa-p
*Acarina sp.	15	m	u
*Diptera sp. (puparium)	6	s	u
*Proctotrupoidea sp.	2	-	u
*Oligochaeta sp. (egg capsule)	1	-	u
*Diptera sp. (pupa)	1	-	u
*Syrphidae sp. (larva)	1	-	u
*Coleoptera sp. (larva)	1	-	u
*Chalcidoidea sp.	1	-	u
*Formicidae sp.	1	-	u
*Aranae sp.	1	-	u

Context: 406 Sample: 406/T ReM: RS
Weight: 1.00 E: 2.00 F: 2.50

Notes: Entered HK 12/11/02. Assessment record made in flot, entered as RS. Flot small, quite a lot of charcoal. NOTE! The jar containing this flot was dropped on the washing room floor and broke. The flot was partly recovered from the floor. Loss and contamination possible. E 1.5-2.5, mode 2 weak; F 1.5-3.5, mode 2.5 weak.

Cryptophagus sp.	3	-	rd-sf
Cercyon analis	2	-	rt-sf
Atomaria sp.	2	-	rd
Lathridius minutus group	2	-	rd-st
Pterostichus ?melanarius	1	-	ob
Cercyon sp.	1	-	u
?Xylodromus concinnus	1	-	rt-st
Gyrohypnus sp.	1	-	rt
Aleocharinae sp. A	1	-	u
Aleocharinae sp. B	1	-	u
Aphodius sp. A	1	-	ob-rf
?Omosita sp.	1	-	rt-sf
?Ephistemus globulus	1	-	rd-sf
*Diptera sp. (puparium)	6	s	u
*Acarina sp.	6	s	u

Context: 425 Sample: 425/T ReM: RS
Weight: 1.00 E: 3.00 F: 2.50

Notes: Entered HK 12/11/02. Assessment record made in flot, entered as RS. Flot 18 mm in jar, mostly ?rootlets, some moss and some undisaggregated humc sediment. Preservation very varied: E 1.0-5.0, mode 3.0 weak; F 1.0-5.0, mode 2.5, weak. Many scraps of cuticle.

Chaetarthria seminulum	6	s	oa-w
Notiophilus sp.	2	-	oa
Dyschirius sp.	2	-	oa
Acidota crenata	2	-	oa

Philonthus sp. B	2	-	u
Trechus sp.	1	-	ob
?Calathus sp.	1	-	oa
Carabidae sp.	1	-	ob
Cryptopleurum minutum	1	-	rf-st
Hydrobius fuscipes	1	-	oa-w
?Anacaena sp.	1	-	oa-w
Oxytelus sculptus	1	-	rt-st
Stenus sp.	1	-	u
Philonthus sp. A	1	-	u
Staphylininae sp.	1	-	u
Tachinus sp.	1	-	u
Aleocharinae sp. A	1	-	u
Aleocharinae sp. B	1	-	u
Pselaphidae sp.	1	-	u
Phyllopertha horticola	1	-	oa-p
?Cetonia sp.	1	-	oa
Simplocaria ?semistriata	1	-	oa-p
Elateridae sp.	1	-	ob
Corticarina or Cortinicara sp.	1	-	rt
Plateumaris sp.	1	-	oa-d-p
?Limnobaris sp.	1	-	oa-p-d
Coleoptera sp.	1	-	u
*Diptera sp. (puparium)	6	s	u
*Acarina sp.	6	s	u
*Coleoptera sp. (larva)	2	-	u
*Heteroptera sp. (nymph)	1	-	u

Context: 453 Sample: 453/T ReM: RS
Weight: 1.00 E: 2.00 F: 2.50

Notes: Notes: Entered HK 13/11/02. Assessment record made in flot, entered as RS. Flot 1 dish, rootlets and other plant tissue. E 1.5-2.5, mode 2.0 weak; F 1.5-3.0, mode 2.5 weak.

Lathridius minutus group	2	-	rd-st
Elaphrus sp.	1	-	oa-d
Pterostichus ?melanarius	1	-	ob
Pterostichus sp.	1	-	ob
Helophorus sp.	1	-	oa-w
Megarthrus sp.	1	-	rt
?Xylodromus concinnus	1	-	rt-st
Carpelimus sp.	1	-	u
Anotylus nitidulus	1	-	rt
Anotylus rugosus	1	-	rt
Xantholininae sp.	1	-	u
Staphylininae sp.	1	-	u
Falagria or Cordalia sp.	1	-	rt-sf
Aleocharinae sp.	1	-	u
Aphodius sp.	1	-	ob-rf
Cantharidae sp.	1	-	ob
Ptinus sp.	1	-	rd-sf
Meligethes sp.	1	-	oa-p
Cryptophagus sp.	1	-	rd-sf
Corticaria sp.	1	-	rt-sf
Chrysomelinae sp.	1	-	oa-p
?Limnobaris sp.	1	-	oa-p-d
*Acarina sp.	15	m	u
*Daphnia sp. (ephippium)	2	-	oa-w
*Cladocera sp. F (ephippium)	2	-	oa-w
*Diptera sp. (puparium)	2	-	u
*Diptera sp. (pupa)	1	-	u
*Aranae sp.	1	-	u

Context: 480 Sample: 480/T ReM: RS
Weight: 1.00 E: 2.50 F: 2.50

Notes: Entered HK 12/11/02. Assessment record made in flot, entered as RS. Flot 4 mm in jar, mostly charcoal. E 1.5-2.5,mode 2.5 distinct; F 2.0-3.5, mode 2.5 weak. Yellow-brown 1-3, mode 3 strong. Scraps of cuticle of various groups present. Preservation unusual.

Lathridius minutus group	2	-	rd-st
Helophorus sp.	1	-	oa-w
Cercyon analis	1	-	rt-sf
?Xylodromus concinnus	1	-	rt-st
Anotylus nitidulus	1	-	rt
Gyrohypnus ?fracticornis	1	-	rt-st
Ptinus sp.	1	-	rd-sf
Cryptophagus sp.	1	-	rd-sf
Corticaria sp.	1	-	rt-sf
Donaciinae sp.	1	-	oa-d-p
?Gymnetron sp.	1	-	oa-p
*Acarina sp.	6	s	u
*Oligochaeta sp. (egg capsule)	3	-	u
*Diptera sp. (puparium)	2	-	u
*Coleoptera sp. (larva)	1	-	u
*Formicidae sp.	1	-	u

Context: 497 Sample: 497/T ReM: RS
Weight: 1.00 E: 2.00 F: 2.50

Notes: Entered HK 12/11/02. Assessment record made in flot, entered as RS. Flot 1 mm in jar, moss and herbaceous debris; some ?heather. Varied preservation, superb to average: E 1.5-3.5, mode 2.0 weak; F 1.0-4.0, mode 2.5 weak.

Cercyon ?analis	2	-	rt-sf
Philonthus sp. A	2	-	u
Atomaria sp.	2	-	rd
Carabidae sp.	1	-	ob
Cercyon sp.	1	-	u
Catops sp.	1	-	u
Omaliinae sp.	1	-	rt
Platystethus arenarius	1	-	rf
Anotylus nitidulus	1	-	rt
Stenus sp. A	1	-	u
Stenus sp. B	1	-	u
Leptacinus sp.	1	-	rt-st

Simplocaria ?semistriata	1	-	oa-p
Cryptophagus sp.	1	-	rd-sf
?Ephistemus globulus	1	-	rd-sf
Enicmus sp.	1	-	rt-sf
Corticaria sp.	1	-	rt-sf
Chaetocnema sp.	1	-	oa-p
Strophosomus sp.	1	-	oa-p
Curculionidae sp.	1	-	oa
*Diptera sp. (pupa)	15	m	u
*Diptera sp. (puparium)	15	m	u
*Acarina sp.	6	s	u
*Oligochaeta sp. (egg capsule)	1	-	u
*Ostracoda sp.	1	-	u
*Formicidae sp.	1	-	u
*Hymenoptera sp.	1	-	u
*Chalcidoidea sp. A	1	-	u
*Chalcidoidea sp. B	1	-	u

Context: 515 Sample: 515/T ReM: RS
Weight: 1.00 E: 0.00 F:

Notes: Entered HK 12/11/02. Assessment record made in flot, entered as RS. Flot small, rootlets, wood fragments and trace of seeds. Preservation good, but too few remains for useful record.

Trechus ?secalis	1	-	oa-d
Helophorus sp.	1	-	oa-w
Gyrohypnus ?angustatus	1	-	rt-st
Xantholinus sp.	1	-	u
*Acarina sp.	15	m	u
*Oligochaeta sp. (egg capsule)	1	-	u
*Diptera sp. (puparium)	1	-	u
*Coleoptera sp. (larva)	1	-	u
*Chalcidoidea sp.	1	-	u
*Insecta sp. (larva)	1	-	u

Context: 532 Sample: 532/T ReM: RS
Weight: 1.00 E: 0.00 F: 2.50

Notes: Entered HK 12/11/02. Assessment record made in flot, entered as RS. Flot 6 mm in jar, moss, ?rootlets, leaf fragments, charcoal. E 1.5-5.0, modes 1.5 and 4.5 distinct; F 1.5-5, mode 2.5 weak. Many very decayed scraps.

Plateumaris sp.	2	-	oa-d-p
Saldidae sp.	1	-	oa-d
Auchenorhyncha sp.	1	-	oa-p
Delphacidae sp.	1	-	oa-p
?Pterostichus sp.	1	-	ob
Helophorus sp.	1	-	oa-w
Cercyon sp.	1	-	u
?Chaetarthria seminulum	1	-	oa-w
Anotylus rugosus	1	-	rt
Stenus sp.	1	-	u
Aleocharinae sp.	1	-	u
Pselaphidae sp.	1	-	u
Aphodius sp.	1	-	ob-rf
Phyllopertha horticola	1	-	oa-p
Cryptophagus sp.	1	-	rd-sf
?Limnobaris sp.	1	-	oa-p-d
*Acarina sp.	15	m	u
*Oligochaeta sp. (egg capsule)	6	s	u
*Diptera sp. (puparium)	6	s	u
*Diptera sp. (pupa)	2	-	u
*Forficula sp.	1	-	u
*Diptera sp. (adult)	1	-	u
*?Apis mellifera	1	-	u
*Aranae sp.	1	-	u

Appendix 2. Main statistics for assemblages of adult beetles and bugs (excluding aphids and scale insects) from samples from the Viborg Søndersø site. Samples recorded during the assessment are included as 'rapid scans'. For explanation of abbreviations, see Table 2.

Context	165	165	166	185	191	194	218	218	218
Sample	1739	1913	1502	1563	1632	2001	1813	1835	1835
Ext	/1	/1	/1	/1	/1	/1	/1	/1	/T
ConalphaN	1739c		1502C		1632c	2001c	1813h	1835h	1835c
S	17	66	31	36	41	21	46	37	74
N	17	118	32	47	86	26	79	68	219
ALPHA	0	62	444	70	31	50	46	33	39
SEALPHA	0	10	395	23	6	24	10	7	4
SOB	7	17	9	10	9	7	13	3	14
PSOB	41	26	29	28	22	33	28	8	19
NOB	7	17	9	10	9	8	15	3	14
PNOB	41	14	28	21	10	31	19	4	6
ALPHAOB	0	0	0	0	0	0	0	0	0
SEALPHAOB	0	0	0	0	0	0	0	0	0
SW	0	2	3	1	1	2	2	0	1
PSW	0	3	10	3	2	10	4	0	1
NW	0	2	3	1	1	2	3	0	1
PNW	0	2	9	2	1	8	4	0	0
ALPHAW	0	0	0	0	0	0	0	0	0
SEALPHAW	0	0	0	0	0	0	0	0	0
SD	0	2	0	1	0	0	1	1	2
PSD	0	3	0	3	0	0	2	3	3
ND	0	2	0	1	0	0	1	1	2
PND	0	2	0	2	0	0	1	1	1
ALPHAD	0	0	0	0	0	0	0	0	0
SEALPHAD	0	0	0	0	0	0	0	0	0
SP	4	8	3	5	5	1	7	0	9
PSP	24	12	10	14	12	5	15	0	12
NP	4	8	3	5	5	2	8	0	9
PNP	24	7	9	11	6	8	10	0	4
ALPHAP	0	0	0	0	0	0	0	0	0
SEALPHAP	0	0	0	0	0	0	0	0	0
SM	0	0	0	0	0	0	0	0	0
PSM	0	0	0	0	0	0	0	0	0
NM	0	0	0	0	0	0	0	0	0
PNM	0	0	0	0	0	0	0	0	0
ALPHAM	0	0	0	0	0	0	0	0	0
SEALPHAM	0	0	0	0	0	0	0	0	0
SL	0	4	0	1	2	2	1	0	3
PSL	0	6	0	3	5	10	2	0	4
NL	0	5	0	1	2	2	1	0	3
PNL	0	4	0	2	2	8	1	0	1
ALPHAL	0	0	0	0	0	0	0	0	0
SEALPHAL	0	0	0	0	0	0	0	0	0
SRT	7	33	20	20	22	12	26	23	41
PSRT	41	50	65	56	54	57	57	62	55
NRT	7	79	21	28	67	16	51	49	157
PNRT	41	67	66	60	78	62	65	72	72
ALPHART	0	21	187	32	12	0	21	17	18

Context	165	165	166	185	191	194	218	218	218
Sample	1739	1913	1502	1563	1632	2001	1813	1835	1835
Ext	/1	/1	/1	/1	/1	/1	/1	/1	/T
ConalphaN	1739c		1502C		1632c	2001c	1813h	1835h	1835c
SEALPHART	0	4	167	13	2	0	5	4	2
SRD	2	7	3	6	5	1	4	5	7
PSRD	12	11	10	17	12	5	9	14	9
NRD	2	24	3	12	18	3	11	11	16
PNRD	12	20	9	26	21	12	14	16	7
ALPHARD	0	3	0	0	0	0	0	0	0
SEALPHARD	0	1	0	0	0	0	0	0	0
SRF	3	9	6	4	5	2	5	4	6
PSRF	18	14	19	11	12	10	11	11	8
NRF	3	11	6	5	10	2	8	5	9
PNRF	18	9	19	11	12	8	10	7	4
ALPHARF	0	0	0	0	0	0	0	0	0
SEALPHARF	0	0	0	0	0	0	0	0	0
SSA	3	22	13	15	15	8	19	17	30
PSSA	18	33	42	42	37	38	41	46	41
NSA	3	58	14	20	45	12	43	36	115
PNSA	18	49	44	43	52	46	54	53	53
ALPHASA	0	13	0	28	8	0	13	13	13
SEALPHASA	0	3	0	15	2	0	3	4	2
SSF	3	14	7	10	10	6	12	10	15
PSSF	18	21	23	28	24	29	26	27	20
NSF	3	37	8	13	31	8	24	26	81
PNSF	18	31	25	28	36	31	30	38	37
ALPHASF	0	8	0	0	5	0	10	6	6
SEALPHASF	0	2	0	0	2	0	4	2	1
SST	0	8	5	5	4	2	7	7	14
PSST	0	12	16	14	10	10	15	19	19
NST	0	21	5	7	11	4	19	10	33
PNST	0	18	16	15	13	15	24	15	15
ALPHAST	0	5	0	0	0	0	0	0	9
SEALPHAST	0	2	0	0	0	0	0	0	3
SSS	0	0	1	0	1	0	0	0	1
PSSS	0	0	3	0	2	0	0	0	1
NSS	0	0	1	0	3	0	0	0	1
PNSS	0	0	3	0	3	0	0	0	0
ALPHASS	0	0	0	0	0	0	0	0	0
SEALPHASS	0	0	0	0	0	0	0	0	0
SG	0	0	0	0	0	0	0	0	0
PSG	0	0	0	0	0	0	0	0	0
NG	0	0	0	0	0	0	0	0	0
PNG	0	0	0	0	0	0	0	0	0
ALPHAG	0	0	0	0	0	0	0	0	0
SEALPHAG	0	0	0	0	0	0	0	0	0

Context	218	253	257	257	270	274	274	301	303
Sample	1881	1989	1994	1994	2018	2016	2017	2385	2362
Ext	/1	/1	/1	/1	/1	/1	/1	/1	/1
ConalphaN	1881w	1989	1994c	1994h/II	2018c	2016f/I	2017/I	2385c	2362c
S	107	64	73	17	88	66	34	80	85
N	238	129	157	19	170	123	39	148	176
ALPHA	75	50	53	0	73	58	124	71	65
SEALPHA	8	8	7	0	10	9	57	10	8
SOB	38	22	25	3	35	23	11	25	30
PSOB	36	34	34	18	40	35	32	31	35
NOB	49	25	29	3	42	47	11	29	38
PNOB	21	19	18	16	25	38	28	20	22
ALPHAOB	77	85	84	0	97	18	0	84	65
SEALPHAOB	25	49	43	0	39	5	0	43	25
SW	2	0	1	0	5	2	0	5	8
PSW	2	0	1	0	6	3	0	6	9
NW	3	0	1	0	6	3	0	6	12
PNW	1	0	1	0	4	2	0	4	7
ALPHAW	0	0	0	0	0	0	0	0	0
SEALPHAW	0	0	0	0	0	0	0	0	0
SD	9	4	2	0	4	3	0	3	4
PSD	8	6	3	0	5	5	0	4	5
ND	11	5	2	0	7	5	0	4	4
PND	5	4	1	0	4	4	0	3	2
ALPHAD	0	0	0	0	0	0	0	0	0
SEALPHAD	0	0	0	0	0	0	0	0	0
SP	15	10	11	2	17	12	5	9	14
PSP	14	16	15	12	19	18	15	11	16
NP	22	11	15	2	20	31	5	9	16
PNP	9	9	10	11	12	25	13	6	9
ALPHAP	21	0	0	0	52	7	0	0	0
SEALPHAP	9	0	0	0	30	2	0	0	0
SM	0	0	0	0	0	0	0	0	0
PSM	0	0	0	0	0	0	0	0	0
NM	0	0	0	0	0	0	0	0	0
PNM	0	0	0	0	0	0	0	0	0
ALPHAM	0	0	0	0	0	0	0	0	0
SEALPHAM	0	0	0	0	0	0	0	0	0
SL	6	1	3	0	3	2	0	6	4
PSL	6	2	4	0	3	3	0	8	5
NL	8	2	4	0	3	2	0	8	6
PNL	3	2	3	0	2	2	0	5	3
ALPHAL	0	0	0	0	0	0	0	0	0
SEALPHAL	0	0	0	0	0	0	0	0	0
SRT	44	30	36	10	40	31	19	33	38
PSRT	41	47	49	59	45	47	56	41	45
NRT	138	87	108	10	105	63	24	93	111
PNRT	58	67	69	53	62	51	62	63	63
ALPHART	22	16	19	0	24	24	43	18	21
SEALPHART	3	3	3	0	4	5	22	3	3
SRD	8	7	10	1	6	4	6	6	9
PSRD	7	11	14	6	7	6	18	8	11
NRD	40	43	49	1	28	20	9	33	49
PNRD	17	33	31	5	16	16	23	22	28

Context	218	253	257	257	270	274	274	301	303
Sample	1881	1989	1994	1994	2018	2016	2017	2385	2362
Ext	/1	/1	/1	/1	/1	/1	/1	/1	/1
ConalphaN	1881w	1989	1994c	1994h/II	2018c	2016f/I	2017/I	2385c	2362c
ALPHARD	3	2	4	0	2	2	0	2	3
SEALPHARD	1	1	1	0	1	1	0	1	1
SRF	8	5	3	2	7	6	3	7	7
PSRF	7	8	4	12	8	9	9	9	8
NRF	16	6	3	2	12	10	3	9	13
PNRF	7	5	2	11	7	8	8	6	7
ALPHARF	0	0	0	0	0	0	0	0	0
SEALPHARF	0	0	0	0	0	0	0	0	0
SSA	31	18	21	7	25	21	12	25	26
PSSA	29	28	29	41	28	32	35	31	31
NSA	100	63	80	7	70	43	17	73	81
PNSA	42	49	51	37	41	35	44	49	46
ALPHASA	16	9	9	0	14	16	0	14	13
SEALPHASA	3	2	2	0	3	4	0	3	2
SSF	19	11	15	6	18	15	11	15	17
PSSF	18	17	21	35	20	23	32	19	20
NSF	64	32	55	6	53	26	15	41	43
PNSF	27	25	35	32	31	21	38	28	24
ALPHASF	9	6	7	0	10	15	0	9	11
SEALPHASF	2	2	2	0	2	5	0	2	3
SST	12	6	6	1	7	6	1	10	9
PSST	11	9	8	6	8	9	3	13	11
NST	36	30	25	1	17	17	2	32	38
PNST	15	23	16	5	10	14	5	22	22
ALPHAST	6	2	3	0	0	0	0	5	4
SEALPHAST	2	1	1	0	0	0	0	2	1
SSS	0	1	0	0	0	0	0	0	0
PSSS	0	2	0	0	0	0	0	0	0
NSS	0	1	0	0	0	0	0	0	0
PNSS	0	1	0	0	0	0	0	0	0
ALPHASS	0	0	0	0	0	0	0	0	0
SEALPHASS	0	0	0	0	0	0	0	0	0
SG	0	0	0	0	0	0	0	0	0
PSG	0	0	0	0	0	0	0	0	0
NG	0	0	0	0	0	0	0	0	0
PNG	0	0	0	0	0	0	0	0	0
ALPHAG	0	0	0	0	0	0	0	0	0
SEALPHAG	0	0	0	0	0	0	0	0	0

Context	304	304	305	338	342	349	349	365	400
Sample	2406	2406	2404	2501	2528	2552	2593	2596	2755
Ext	/1	/1	/1	/1	/1	/1	/1	/1	/1
ConalphaN		2406c	2404c	2501c	2528h	2552h	2593h	2596h	2755c
S	103	59	59	39	6	9	7	7	27
N	157	79	115	47	6	9	7	7	30
ALPHA	130	105	49	106	0	0	0	0	126
SEALPHA	20	26	8	40	0	0	0	0	73
SOB	40	19	17	17	4	7	4	3	18
PSOB	39	32	29	44	67	78	57	43	67
NOB	52	24	17	17	4	7	4	3	21
PNOB	33	30	15	36	67	78	57	43	70
ALPHAOB	79	43	0	0	0	0	0	0	58
SEALPHAOB	25	22	0	0	0	0	0	0	34
SW	11	5	2	1	0	0	0	2	4
PSW	11	8	3	3	0	0	0	29	15
NW	14	8	2	1	0	0	0	2	7
PNW	9	10	2	2	0	0	0	29	23
ALPHAW	0	0	0	0	0	0	0	0	0
SEALPHAW	0	0	0	0	0	0	0	0	0
SD	6	5	2	5	0	0	0	0	4
PSD	6	8	3	13	0	0	0	0	15
ND	8	6	2	5	0	0	0	0	3
PND	5	8	2	11	0	0	0	0	10
ALPHAD	0	0	0	0	0	0	0	0	0
SEALPHAD	0	0	0	0	0	0	0	0	0
SP	17	8	9	6	2	4	2	1	6
PSP	17	14	15	15	33	44	29	14	22
NP	20	10	9	6	2	4	2	1	6
PNP	13	13	8	13	33	44	29	14	20
ALPHAP	52	0	0	0	0	0	0	0	0
SEALPHAP	30	0	0	0	0	0	0	0	0
SM	1	0	0	1	1	0	0	0	0
PSM	1	0	0	3	17	0	0	0	0
NM	1	0	0	1	1	0	0	0	0
PNM	1	0	0	2	17	0	0	0	0
ALPHAM	0	0	0	0	0	0	0	0	0
SEALPHAM	0	0	0	0	0	0	0	0	0
SL	6	1	3	0	0	0	0	0	0
PSL	6	2	5	0	0	0	0	0	0
NL	7	1	5	0	0	0	0	0	0
PNL	4	1	4	0	0	0	0	0	0
ALPHAL	0	0	0	0	0	0	0	0	0
SEALPHAL	0	0	0	0	0	0	0	0	0
SRT	38	23	29	18	1	3	1	3	5
PSRT	37	39	49	46	17	33	14	43	19
NRT	76	37	73	26	1	3	1	3	5
PNRT	48	47	63	55	17	33	14	43	17
ALPHART	30	26	18	26	0	0	0	0	0
SEALPHART	6	8	3	11	0	0	0	0	0
SRD	6	6	7	4	0	0	0	2	2
PSRD	6	10	12	10	0	0	0	29	7
NRD	21	12	37	11	0	0	0	2	2
PNRD	13	15	32	23	0	0	0	29	7

Context	304	304	305	338	342	349	349	365	400
Sample	2406	2406	2404	2501	2528	2552	2593	2596	2755
Ext	/1	/1	/1	/1	/1	/1	/1	/1	/1
ConalphaN		2406c	2404c	2501c	2528h	2552h	2593h	2596h	2755c
ALPHARD	3	0	3	0	0	0	0	0	0
SEALPHARD	1	0	1	0	0	0	0	0	0
SRF	5	2	5	4	0	2	1	0	0
PSRF	5	3	8	10	0	22	14	0	0
NRF	6	2	5	4	0	2	1	0	0
PNRF	4	3	4	9	0	22	14	0	0
ALPHARF	0	0	0	0	0	0	0	0	0
SEALPHARF	0	0	0	0	0	0	0	0	0
SSA	26	15	18	10	0	1	0	3	4
PSSA	25	25	31	26	0	11	0	43	15
NSA	63	28	58	17	0	1	0	3	4
PNSA	40	35	50	36	0	11	0	43	13
ALPHASA	17	13	9	0	0	0	0	0	0
SEALPHASA	3	5	2	0	0	0	0	0	0
SSF	19	10	10	6	0	1	0	2	3
PSSF	18	17	17	15	0	11	0	29	11
NSF	39	18	27	9	0	1	0	2	3
PNSF	25	23	23	19	0	11	0	29	10
ALPHASF	15	0	6	0	0	0	0	0	0
SEALPHASF	4	0	2	0	0	0	0	0	0
SST	7	5	8	4	0	0	0	1	1
PSST	7	8	14	10	0	0	0	14	4
NST	24	10	31	8	0	0	0	1	1
PNST	15	13	27	17	0	0	0	14	3
ALPHAST	3	0	4	0	0	0	0	0	0
SEALPHAST	1	0	1	0	0	0	0	0	0
SSS	0	0	0	0	0	0	0	0	0
PSSS	0	0	0	0	0	0	0	0	0
NSS	0	0	0	0	0	0	0	0	0
PNSS	0	0	0	0	0	0	0	0	0
ALPHASS	0	0	0	0	0	0	0	0	0
SEALPHASS	0	0	0	0	0	0	0	0	0
SG	0	0	0	0	0	0	0	0	0
PSG	0	0	0	0	0	0	0	0	0
NG	0	0	0	0	0	0	0	0	0
PNG	0	0	0	0	0	0	0	0	0
ALPHAG	0	0	0	0	0	0	0	0	0
SEALPHAG	0	0	0	0	0	0	0	0	0

Context	406	426	480	515	515	521	532	143	185
Sample	2819	3008	3184	3367	3370	3390	3519	143	185
Ext	/1	/1	/1	/1	/1	/1	/1	/T	/T
ConalphaN	2819C	3008h	3184h	3367c	3370w	3390h	3510h		
S	35	65	51	25	14	36	38	35	20
N	54	91	76	27	15	47	42	41	24
ALPHA	44	101	68	156	0	70	188	111	55
SEALPHA	12	22	15	107	0	23	95	47	28
SOB	10	26	19	16	9	21	25	13	2
PSOB	29	40	37	64	64	58	66	37	10
NOB	10	28	25	18	10	32	29	13	2
PNOB	19	31	33	67	67	68	69	32	8
ALPHAOB	0	168	37	0	0	27	84	0	0
SEALPHAOB	0	115	17	0	0	10	43	0	0
SW	0	3	2	2	0	4	7	3	0
PSW	0	5	4	8	0	11	18	9	0
NW	0	3	2	4	0	14	8	3	0
PNW	0	3	3	15	0	30	19	7	0
ALPHAW	0	0	0	0	0	0	0	0	0
SEALPHAW	0	0	0	0	0	0	0	0	0
SD	1	5	5	4	2	5	4	2	0
PSD	3	8	10	16	14	14	11	6	0
ND	1	7	6	4	2	6	5	2	0
PND	2	8	8	15	13	13	12	5	0
ALPHAD	0	0	0	0	0	0	0	0	0
SEALPHAD	0	0	0	0	0	0	0	0	0
SP	5	14	10	7	4	11	10	3	1
PSP	14	22	20	28	29	31	26	9	5
NP	5	15	13	7	5	11	10	3	1
PNP	9	16	17	26	33	23	24	7	4
ALPHAP	0	0	0	0	0	0	0	0	0
SEALPHAP	0	0	0	0	0	0	0	0	0
SM	0	1	0	0	0	0	0	0	0
PSM	0	2	0	0	0	0	0	0	0
NM	0	1	0	0	0	0	0	0	0
PNM	0	1	0	0	0	0	0	0	0
ALPHAM	0	0	0	0	0	0	0	0	0
SEALPHAM	0	0	0	0	0	0	0	0	0
SL	0	1	3	1	0	0	0	0	1
PSL	0	2	6	4	0	0	0	0	5
NL	0	1	5	1	0	0	0	0	1
PNL	0	1	7	4	0	0	0	0	4
ALPHAL	0	0	0	0	0	0	0	0	0
SEALPHAL	0	0	0	0	0	0	0	0	0
SRT	20	32	20	6	5	6	8	15	14
PSRT	57	49	39	24	36	17	21	43	70
NRT	37	55	33	6	5	6	8	20	17
PNRT	69	60	43	22	33	13	19	49	71
ALPHART	18	32	22	0	0	0	0	28	0
SEALPHART	5	8	7	0	0	0	0	15	0
SRD	8	8	4	1	0	3	1	3	3
PSRD	23	12	8	4	0	8	3	9	15
NRD	15	18	11	1	0	3	1	5	5
PNRD	28	20	14	4	0	6	2	12	21

Context	406	426	480	515	515	521	532	143	185
Sample	2819	3008	3184	3367	3370	3390	3519	143	185
Ext	/1	/1	/1	/1	/1	/1	/1	/T	/T
ConalphaN	2819C	3008h	3184h	3367c	3370w	3390h	3510h		
ALPHARD	0	0	0	0	0	0	0	0	0
SEALPHARD	0	0	0	0	0	0	0	0	0
SRF	3	7	2	2	3	2	3	3	3
PSRF	9	11	4	8	21	6	8	9	15
NRF	3	8	2	2	3	2	3	3	3
PNRF	6	9	3	7	20	4	7	7	13
ALPHARF	0	0	0	0	0	0	0	0	0
SEALPHARF	0	0	0	0	0	0	0	0	0
SSA	12	18	15	3	1	5	3	8	7
PSSA	34	28	29	12	7	14	8	23	35
NSA	27	38	27	3	1	5	3	12	9
PNSA	50	42	36	11	7	11	7	29	38
ALPHASA	8	14	14	0	0	0	0	0	0
SEALPHASA	3	4	5	0	0	0	0	0	0
SSF	9	11	11	0	1	3	1	5	4
PSSF	26	17	22	0	7	8	3	14	20
NSF	21	20	18	0	1	3	1	8	5
PNSF	39	22	24	0	7	6	2	20	21
ALPHASF	6	10	0	0	0	0	0	0	0
SEALPHASF	2	4	0	0	0	0	0	0	0
SST	3	6	4	3	0	2	2	3	3
PSST	9	9	8	12	0	6	5	9	15
NST	6	17	9	3	0	2	2	4	4
PNST	11	19	12	11	0	4	5	10	17
ALPHAST	0	0	0	0	0	0	0	0	0
SEALPHAST	0	0	0	0	0	0	0	0	0
SSS	0	1	0	0	0	0	0	0	0
PSSS	0	2	0	0	0	0	0	0	0
NSS	0	1	0	0	0	0	0	0	0
PNSS	0	1	0	0	0	0	0	0	0
ALPHASS	0	0	0	0	0	0	0	0	0
SEALPHASS	0	0	0	0	0	0	0	0	0
SG	0	0	0	0	0	0	0	0	0
PSG	0	0	0	0	0	0	0	0	0
NG	0	0	0	0	0	0	0	0	0
PNG	0	0	0	0	0	0	0	0	0
ALPHAG	0	0	0	0	0	0	0	0	0
SEALPHAG	0	0	0	0	0	0	0	0	0

Context	188	194	218	253	257	295	301	304	306
Sample	188	194	218	253	257	295	301	304	306
Ext	/T	/T	/T	/T	/T	/T	/T	/T	/T
ConalphaN									
S	26	6	35	20	23	9	29	32	34
N	48	6	53	28	25	9	31	32	48
ALPHA	23	0	45	32	132	0	208	0	51
SEALPHA	6	0	12	13	91	0	142	0	15
SOB	4	2	7	4	5	1	11	14	10
PSOB	15	33	20	20	22	11	38	44	29
NOB	4	2	8	4	5	1	11	14	10
PNOB	8	33	15	14	20	11	35	44	21
ALPHAOB	0	0	0	0	0	0	0	0	0
SEALPHAOB	0	0	0	0	0	0	0	0	0
SW	1	0	1	1	0	0	1	4	2
PSW	4	0	3	5	0	0	3	13	6
NW	1	0	1	1	0	0	1	4	2
PNW	2	0	2	4	0	0	3	13	4
ALPHAW	0	0	0	0	0	0	0	0	0
SEALPHAW	0	0	0	0	0	0	0	0	0
SD	0	0	1	0	0	0	0	1	1
PSD	0	0	3	0	0	0	0	3	3
ND	0	0	2	0	0	0	0	1	1
PND	0	0	4	0	0	0	0	3	2
ALPHAD	0	0	0	0	0	0	0	0	0
SEALPHAD	0	0	0	0	0	0	0	0	0
SP	0	1	3	2	3	1	5	3	4
PSP	0	17	9	10	13	11	17	9	12
NP	0	1	3	2	3	1	5	3	4
PNP	0	17	6	7	12	11	16	9	8
ALPHAP	0	0	0	0	0	0	0	0	0
SEALPHAP	0	0	0	0	0	0	0	0	0
SM	0	0	0	0	0	0	0	0	0
PSM	0	0	0	0	0	0	0	0	0
NM	0	0	0	0	0	0	0	0	0
PNM	0	0	0	0	0	0	0	0	0
ALPHAM	0	0	0	0	0	0	0	0	0
SEALPHAM	0	0	0	0	0	0	0	0	0
SL	0	1	0	0	1	0	1	0	2
PSL	0	17	0	0	4	0	3	0	6
NL	0	1	0	0	1	0	1	0	2
PNL	0	17	0	0	4	0	3	0	4
ALPHAL	0	0	0	0	0	0	0	0	0
SEALPHAL	0	0	0	0	0	0	0	0	0
SRT	17	1	20	15	12	4	13	13	17
PSRT	65	17	57	75	52	44	45	41	50
NRT	33	1	32	23	14	4	13	13	28
PNRT	69	17	60	82	56	44	42	41	58
ALPHART	14	0	23	19	0	0	0	0	19
SEALPHART	4	0	8	8	0	0	0	0	7
SRD	4	0	3	4	3	1	3	3	3
PSRD	15	0	9	20	13	11	10	9	9
NRD	7	0	4	11	4	1	3	3	6
PNRD	15	0	8	39	16	11	10	9	13

Context	188	194	218	253	257	295	301	304	306
Sample	188	194	218	253	257	295	301	304	306
Ext	/T	/T	/T	/T	/T	/T	/T	/T	/T
ConalphaN									
ALPHARD	0	0	0	0	0	0	0	0	0
SEALPHARD	0	0	0	0	0	0	0	0	0
SRF	4	1	4	1	2	1	2	2	3
PSRF	15	17	11	5	9	11	7	6	9
NRF	4	1	4	1	2	1	2	2	4
PNRF	8	17	8	4	8	11	6	6	8
ALPHARF	0	0	0	0	0	0	0	0	0
SEALPHARF	0	0	0	0	0	0	0	0	0
SSA	12	0	13	8	7	2	9	8	12
PSSA	46	0	37	40	30	22	31	25	35
NSA	27	0	23	16	9	2	9	8	20
PNSA	56	0	43	57	36	22	29	25	42
ALPHASA	8	0	13	0	0	0	0	0	13
SEALPHASA	3	0	5	0	0	0	0	0	6
SSF	6	0	7	5	5	1	5	2	6
PSSF	23	0	20	25	22	11	17	6	18
NSF	13	0	16	8	7	1	5	2	11
PNSF	27	0	30	29	28	11	16	6	23
ALPHASF	0	0	0	0	0	0	0	0	0
SEALPHASF	0	0	0	0	0	0	0	0	0
SST	6	0	6	3	2	1	4	6	6
PSST	23	0	17	15	9	11	14	19	18
NST	14	0	7	8	2	1	4	6	9
PNST	29	0	13	29	8	11	13	19	19
ALPHAST	0	0	0	0	0	0	0	0	0
SEALPHAST	0	0	0	0	0	0	0	0	0
SSS	0	0	0	0	0	0	0	0	0
PSSS	0	0	0	0	0	0	0	0	0
NSS	0	0	0	0	0	0	0	0	0
PNSS	0	0	0	0	0	0	0	0	0
ALPHASS	0	0	0	0	0	0	0	0	0
SEALPHASS	0	0	0	0	0	0	0	0	0
SG	0	0	0	0	0	0	0	0	0
PSG	0	0	0	0	0	0	0	0	0
NG	0	0	0	0	0	0	0	0	0
PNG	0	0	0	0	0	0	0	0	0
ALPHAG	0	0	0	0	0	0	0	0	0
SEALPHAG	0	0	0	0	0	0	0	0	0

Context	307	309	342	349	365	392	395	406	425
Sample	307	309	342	349	365	392	395	406	425
Ext	/T	/T	/T	/T	/T	/T	/T	/T	/T
ConalphaN									
S	33	34	9	6	7	32	26	13	27
N	44	45	9	6	7	49	29	18	36
ALPHA	59	63	0	0	0	40	117	0	50
SEALPHA	20	21	0	0	0	11	68	0	19
SOB	11	13	3	3	3	9	9	2	15
PSOB	33	38	33	50	43	28	35	15	56
NOB	11	15	3	3	3	10	9	2	23
PNOB	25	33	33	50	43	20	31	11	64
ALPHAOB	0	0	0	0	0	0	0	0	19
SEALPHAOB	0	0	0	0	0	0	0	0	8
SW	1	1	1	0	0	0	0	0	3
PSW	3	3	11	0	0	0	0	0	11
NW	1	1	1	0	0	0	0	0	8
PNW	2	2	11	0	0	0	0	0	22
ALPHAW	0	0	0	0	0	0	0	0	0
SEALPHAW	0	0	0	0	0	0	0	0	0
SD	2	2	0	0	0	1	0	0	2
PSD	6	6	0	0	0	3	0	0	7
ND	2	2	0	0	0	1	0	0	2
PND	5	4	0	0	0	2	0	0	6
ALPHAD	0	0	0	0	0	0	0	0	0
SEALPHAD	0	0	0	0	0	0	0	0	0
SP	2	5	2	1	3	4	3	0	4
PSP	6	15	22	17	43	13	12	0	15
NP	2	5	2	1	3	5	3	0	4
PNP	5	11	22	17	43	10	10	0	11
ALPHAP	0	0	0	0	0	0	0	0	0
SEALPHAP	0	0	0	0	0	0	0	0	0
SM	0	0	0	0	0	0	0	0	0
PSM	0	0	0	0	0	0	0	0	0
NM	0	0	0	0	0	0	0	0	0
PNM	0	0	0	0	0	0	0	0	0
ALPHAM	0	0	0	0	0	0	0	0	0
SEALPHAM	0	0	0	0	0	0	0	0	0
SL	0	0	0	0	0	0	1	0	0
PSL	0	0	0	0	0	0	4	0	0
NL	0	0	0	0	0	0	1	0	0
PNL	0	0	0	0	0	0	3	0	0
ALPHAL	0	0	0	0	0	0	0	0	0
SEALPHAL	0	0	0	0	0	0	0	0	0
SRT	16	15	4	1	0	17	14	9	3
PSRT	48	44	44	17	0	53	54	69	11
NRT	24	20	4	1	0	27	17	14	3
PNRT	55	44	44	17	0	55	59	78	8
ALPHART	21	28	0	0	0	20	0	0	0
SEALPHART	9	15	0	0	0	8	0	0	0
SRD	4	4	2	0	0	4	4	4	0
PSRD	12	12	22	0	0	13	15	31	0
NRD	5	4	2	0	0	7	6	8	0
PNRD	11	9	22	0	0	14	21	44	0

Context	307	309	342	349	365	392	395	406	425
Sample	307	309	342	349	365	392	395	406	425
Ext	/T	/T	/T	/T	/T	/T	/T	/T	/T
ConalphaN									
ALPHARD	0	0	0	0	0	0	0	0	0
SEALPHARD	0	0	0	0	0	0	0	0	0
SRF	2	4	0	0	0	4	3	1	1
PSRF	6	12	0	0	0	13	12	8	4
NRF	4	6	0	0	0	4	3	1	1
PNRF	9	13	0	0	0	8	10	6	3
ALPHARF	0	0	0	0	0	0	0	0	0
SEALPHARF	0	0	0	0	0	0	0	0	0
SSA	10	6	2	1	0	11	8	6	2
PSSA	30	18	22	17	0	34	31	46	7
NSA	16	7	2	1	0	19	11	10	2
PNSA	36	16	22	17	0	39	38	56	6
ALPHASA	0	0	0	0	0	0	0	0	0
SEALPHASA	0	0	0	0	0	0	0	0	0
SSF	5	3	2	0	0	7	6	4	0
PSSF	15	9	22	0	0	22	23	31	0
NSF	11	4	2	0	0	10	8	7	0
PNSF	25	9	22	0	0	20	28	39	0
ALPHASF	0	0	0	0	0	0	0	0	0
SEALPHASF	0	0	0	0	0	0	0	0	0
SST	5	3	0	1	0	4	2	2	2
PSST	15	9	0	17	0	13	8	15	7
NST	5	3	0	1	0	9	3	3	2
PNST	11	7	0	17	0	18	10	17	6
ALPHAST	0	0	0	0	0	0	0	0	0
SEALPHAST	0	0	0	0	0	0	0	0	0
SSS	0	0	0	0	0	0	0	0	0
PSSS	0	0	0	0	0	0	0	0	0
NSS	0	0	0	0	0	0	0	0	0
PNSS	0	0	0	0	0	0	0	0	0
ALPHASS	0	0	0	0	0	0	0	0	0
SEALPHASS	0	0	0	0	0	0	0	0	0
SG	0	0	0	0	0	0	0	0	0
PSG	0	0	0	0	0	0	0	0	0
NG	0	0	0	0	0	0	0	0	0
PNG	0	0	0	0	0	0	0	0	0
ALPHAG	0	0	0	0	0	0	0	0	0
SEALPHAG	0	0	0	0	0	0	0	0	0

Context	453	480	497	515	532	Whole
Sample	453	480	497	515	532	site
Ext	/T	/T	/T	/T	/T	
ConalphaN						
S	22	11	20	4	16	442
N	23	12	23	4	17	3367
ALPHA	225	0	70	0	0	136
SEALPHA	201	0	41	0	0	4
SOB	9	3	5	2	10	212
PSOB	41	27	25	50	63	48
NOB	9	3	5	2	11	849
PNOB	39	25	22	50	65	25
ALPHAOB	0	0	0	0	0	91
SEALPHAOB	0	0	0	0	0	5
SW	1	1	0	1	2	22
PSW	5	9	0	25	13	5
NW	1	1	0	1	2	138
PNW	4	8	0	25	12	4
ALPHAW	0	0	0	0	0	7
SEALPHAW	0	0	0	0	0	1
SD	2	1	0	1	3	38
PSD	9	9	0	25	19	9
ND	2	1	0	1	4	121
PND	9	8	0	25	24	4
ALPHAD	0	0	0	0	0	19
SEALPHAD	0	0	0	0	0	3
SP	3	2	3	0	5	101
PSP	14	18	15	0	31	23
NP	3	2	3	0	6	366
PNP	13	17	13	0	35	11
ALPHAP	0	0	0	0	0	46
SEALPHAP	0	0	0	0	0	4
SM	0	0	0	0	0	2
PSM	0	0	0	0	0	0
NM	0	0	0	0	0	4
PNM	0	0	0	0	0	0
ALPHAM	0	0	0	0	0	0
SEALPHAM	0	0	0	0	0	0
SL	0	0	0	0	0	24
PSL	0	0	0	0	0	5
NL	0	0	0	0	0	74
PNL	0	0	0	0	0	2
ALPHAL	0	0	0	0	0	12
SEALPHAL	0	0	0	0	0	2
SRT	10	8	10	1	3	863
PSRT	45	73	50	25	19	195
NRT	11	9	12	1	3	1933
PNRT	48	75	52	25	18	57
ALPHART	0	0	0	0	0	598
SEALPHART	0	0	0	0	0	22
SRD	3	3	3	0	1	211
PSRD	14	27	15	0	6	48
NRD	4	4	4	0	1	600
PNRD	17	33	17	0	6	18

Context	453	480	497	515	532	Whole
Sample	453	480	497	515	532	site
Ext	/T	/T	/T	/T	/T	
ConalphaN						
ALPHARD	0	0	0	0	0	116
SEALPHARD	0	0	0	0	0	8
SRF	1	0	1	0	1	177
PSRF	5	0	5	0	6	40
NRF	1	0	1	0	1	225
PNRF	4	0	4	0	6	7
ALPHARF	0	0	0	0	0	382
SEALPHARF	0	0	0	0	0	60
SSA	6	7	6	1	1	90
PSSA	27	64	30	25	6	20
NSA	7	8	7	1	1	1385
PNSA	30	67	30	25	6	41
ALPHASA	0	0	0	0	0	22
SEALPHASA	0	0	0	0	0	1
SSF	4	4	5	0	1	55
PSSF	18	36	25	0	6	12
NSF	4	4	6	0	1	862
PNSF	17	33	26	0	6	26
ALPHASF	0	0	0	0	0	13
SEALPHASF	0	0	0	0	0	1
SST	2	3	1	1	0	31
PSST	9	27	5	25	0	7
NST	3	4	1	1	0	516
PNST	13	33	4	25	0	15
ALPHAST	0	0	0	0	0	7
SEALPHAST	0	0	0	0	0	1
SSS	0	0	0	0	0	4
PSSS	0	0	0	0	0	1
NSS	0	0	0	0	0	7
PNSS	0	0	0	0	0	0
ALPHASS	0	0	0	0	0	0
SEALPHASS	0	0	0	0	0	0
SG	0	0	0	0	0	0
PSG	0	0	0	0	0	0
NG	0	0	0	0	0	0
PNG	0	0	0	0	0	0
ALPHAG	0	0	0	0	0	0
SEALPHAG	0	0	0	0	0	0

Appendix 3. Sediment descriptions made in the laboratory. Those for the main phase were made by John Carrott.

Context	Sample	Description
K143	1292c	Moist, very dark brown, crumbly (layered and brittle in places), slightly sandy and slightly silty amorphous organic sediment, with some rotted wood and twigs.
K165	1739c	Moist, very dark brown to black, layered and slightly compressed, mostly wood and twig fragments, with a small amount of matrix of amorphous organic sediment, a little silt, and an occasional sand grain.
	1739h	Moist to wet, mostly decayed (orange) wood fragments (to 100mm, and including roundwood/twig) in a matrix of very dark brown to black, amorphous organic sediment, with perhaps a little silt and sand.
	1913h	Moist to wet (holds water like a sponge), very dark brown (slightly lighter internally), crumbly (fibrous and somewhat layered in places), fine and coarse herbaceous detritus in a matrix of slightly silty, amorphous organic sediment.
K166	1502c	Moist, very dark brown, crumbly, amorphous organic sediment, with a little ?silt and sand. Rotted wood fragments were common and twigs and some finer plant material were present.
K185	1563c	Moist, dark brown to very dark brown, crumbly to unconsolidated, very humic slightly sandy silt, with abundant wood fragments and occasional rootlet/twig fragments. Wood forms approximately 80% of the sample by volume and at least some of it appears worked.
K191	1632c	Moist, very dark grey-brown to black, crumbly to unconsolidated, very sandy amorphous organic sediment, with, perhaps, a little silt. Stones (2 to 6 mm) and wood fragments were present.
K194	2001c	Moist, very dark brown to black, crumbly to unconsolidated, ashy, sandy silt, with stones (2 to 20 mm) and twigs present, and charcoal common.
K218	1813h	Description as K218, x1835h with the addition of a cow metatarsal.
	1835h	Moist, very dark brown, crumbly, abundant wood/twig fragments in a matrix of amorphous organic sediment and silt, with a 'dusting' of sand grains.
	1881h	Moist, mostly wood (including 'chips'), twigs and 'straw' in a matrix of very humic silt (dark brown externally; light brown and very slightly orange internally) as a compressed and layered 'block'. Very 'fresh' look and smell.
K253	1989c	Moist, dark brown to black, crumbly to unconsolidated, humic, slightly clay sandy silt, with wood fragments (to 20 mm) common, and twigs, stones (2 to 20 mm) and curls of bark, present. There were also some patches of light to mid blue-grey and yellow-grey-brown clay silts.
K257	1994c	Description as for the organic component of K257, x1994h/II, with a light 'dusting' of sand and a little ash and silt.
	1994h/II	Two main components: 1. Moist very dark brown to black, compressed and layered to crumbly, fine and coarse woody and herbaceous detritus, and 2. Moist, mid brown to mid grey-brown, crumbly, sand. Plus a few pieces of ?worked wood (to 55 mm) and a few stones (to 25 mm).
K270	2018c	Moist, dark brown (speckled with lighter sand grains), crumbly to unconsolidated, humic sand (to sandy amorphous organic sediment). Fragments of rotted wood were common and twigs were present.
K274	2016f/I	Description as K274, x2017/fI but with more twigs and wood ?chips and some patches of organic rich silt (rather like small lumps of K304, x2406mg/II).
	2017f/I	Just moist, varicoloured (mostly mid to dark grey-brown flecked with pale grey, some areas of white, black and yellow), unconsolidated and gritty (?from fine cinder), very ashy silt, with stones (to 25 mm) common and occasional twigs and lumps of soft, pale grey, clay silt.
K301	2385c	Moist, very dark brown to black, crumbly to unconsolidated, fine anc coarse herbaceous detritus in a matrix of amorphous organic sediment, with some silt and a little sand. 'Woody' fragments (including twigs) were abundant.

K303	2362c	Description as K165, x1739h but with rather more silt and slightly less wood fragments
K304	2406c	Moist to wet, very dark brown, soft to unconsolidated, amorphous organic sediment and silt, with some coarser organic components including wood fragments.
	2406mg/II	Moist, dark brown, crumbly and somewhat layered in places (working soft), very organic silt (to silty amorphous organic sediment). Includes large wood fragments, curls of bark, fish scales, stones (to 45 mm), and fine and coarse herbaceous detritus.
	2404c	Moist, dark and rich chocolate-brown, compressed and soft (works slightly sticky), fine herbaceous detritus in a matrix of amorphous organic sediment with a little clay. Wood (to 100 mm and more, and including roundwood) and finer plant detritus were abundant.
K307	2355h	Description similar to K307, x3121h but with abundant wood fragments and the finer organic component much more decayed. The main matrix component in this case was amorphous organic sediment.
	3121h	Description as K521, x3390h but layered and compressed and with no (or very little) coarser 'woody' material. Internal colour was orange from rotting organic material. Beetles, fly puparia, seeds, pieces of straw and a large mammal mandible fragment were all present. NB: this material looks weeks old rather than hundreds of years!!!
K338	2501c	Moist, mid to dark brown, unconsolidated, ?ashy, slightly clay silty sand. Stones (2 to 20 mm) present
	2528h	Just moist, varicoloured (light brown to dark grey-brown in shades of brown and grey-brown), brittle to crumbly (layered in places), ?ashy sand. Stones (2 to 20 mm) and fragments of rotted ?wood were present.
K349	2552h	Description as K349, x2593h
	2593h	Just moist, mid to mid to dark grey and light to mid orange-brown (colours well mixed), crumbly to unconsolidated, slightly clay (and ?slightly ashy) sand, with stones (2 to 20 mm) present.
K365	2596h	Just moist, light brown to mid grey-brown, crumbly to unconsolidated, sand, with some stones (2 to 30 mm) present.
K400	2755c	Moist, very dark brown, crumbly (working soft), slightly sandy amorphous organic sediment (and perhaps a little silt), with fine and coarse herbaceous detritus.
K406	2819c	Moist, mid brown to mid to dark grey-brown, crumbly and slightly sticky (working more or less soft), humic, slightly clay silty sand. Stones (2 to 20 mm) and fragments of rotted wood were present.
	3008h	Moist, very dark brown, crumbly, very well preserved wood/bark/twigs/'straw' and fine herbaceous detritus in a matrix of amorphous organic sediment and silt.
K480	3184h	Moist, varicoloured (mostly light to mid grey-brown, with light grey, mid grey, mid brown, black, and some patches of yellow-grey and pale blue-grey). The grey and grey-brown parts were of crumbly, slightly clay sand. The black and mid brown components were very organic and of amorphous organic sediment and fine and coarse woody and herbaceous detritus. the yellow-grey and pale blue-grey areas were sticky (working plastic) clays. Stones (2 to 20 mm) and twigs were present.
K515	3367c	Moist, mid grey-brown (some patches of orange-brown and light grey-brown), crumbly to unconsolidated, slightly clay sand. Twigs, stones (2 to 20 mm) and some fine herbaceous detritus (including ?rootlets) were present, as were some patches of light grey and yellow clays.
	3370h	Moist, varicoloured (buff to dark grey-brown in shades of brown and grey-brown), slightly layered in places and locally fibrous (?rotted wood and other organics) to unconsolidated, silty sand, with more humic/organic patches. One large piece of very rotted wood (to 70 mm) was seen but this will likely disintegrate during processing.
K521	x3390h	Moist, dark brown externally (mid orange-brown to mid grey-brown internally), brittle to crumbly, amorphous organic sediment and a little silt, with a 'dusting' of

		sand grains. There was abundant fine 'peaty' herbaceous detritus and some coarser woody (including twigs) plant material.
K532	x3510h	Description as K307, x3121h but much more decayed. Seeds, beetles etc not immediately visibly in the deposit. Also includes an occasional twig with bark.