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**Biological remains from excavations of medieval deposits at  
63-64 Baxtergate, Whitby (site code WB2)**

by

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**Summary**

A series of twelve samples of sediment from excavations of 13th-15th century deposits at 63-4 Baxtergate, Whitby, North Yorkshire was examined for their content of plant and animal remains. For the most part they contained few preserved remains but some samples gave small assemblages of plant and invertebrate fossils indicative of human occupation. There was no evidence for flooding and in particular the evidence for marine biota was limited to a few fragments of marine mollusc shell likely to have originated in discarded food waste.

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# Biological remains from excavations of medieval deposits in Baxtergate, Whitby (site code WB2)

## Practical and interpretative methods

### Sample processing

Twelve samples of sediment from excavations at 63-4 Baxtergate, Whitby were investigated for plant and animal remains. All were described in the laboratory using a standard *pro forma* and 1 kilogramme subsamples of each processed using techniques described by Kenward *et al.* (1980). In each case, paraffin flotation was carried out to extract insects and other invertebrates. Plant remains were examined from the resulting flots and from 'washovers' from the residues. The latter were oven dried and then checked for bone and shell.

### Plant remains

Lists of plant taxa identified from flots, washovers and residues were made using a four-point scale of quantification (1 - one or a few individuals/fragments per kg; 2 - approx. 5-10 individuals or modest numbers of fragments per kg; 3 - 10-100 individuals or many fragments per kg; 4 - >100 or abundant fragments per kg). To provide a crude kind of analysis of the results, each identifiable taxon in each list was assigned a score of 1 to 3 for their value as indicators of one or more ecological and 'use' groups. Thus, for example, a common waste ground weed such as fat-hen, *Chenopodium album*, scores 3 in the 'annual nitrophile weed' group CHEN, whilst deadly nightshade, *Atropa bella-donna*, scores 3 for EPIL (tall herb vegetation of woodland margins and clearings), 2 for CALC (plants of calcareous soils) and 1 for HERB (plants potentially used as medicinal herbs), while linseed or flax, *Linum usitatissimum*, scores 3 for FOOS (foodplants), FOOO (oil-seeds) and FIBR (fibre plants). From the combination of scores for abundance and indicator values were calculated the AIVs (abundance-indicator value, cf. Hall and Kenward 1990). This gives a general measure of how significant a particular group of plants or an inferred vegetation type are for each sample.

### Intestinal parasite eggs

A small subsample from each sample was checked quickly for parasite eggs using the method outlined by Dainton (1992), which involves scanning a 'squash' of disaggregated sediment in water.

### Insect remains

The assemblages of adult beetles and bugs of the groups used to calculate 'main statistics' (see below) were 'scan' recorded (*sensu* Kenward 1992) unless otherwise stated. Other

invertebrates were recorded semi-quantitatively. This method employs a five-point scale (Kenward *et al.* 1986), abundance for each taxon being estimated as 1, 2, 3, 'several' or 'many'. The last two are converted to 6 and 15 respectively for statistical purposes, a conversion discussed by Kenward (1992). Preservation was roughly quantified on a five point scale for chemical erosion and fragmentation.

Counts are for 'minimum number of individuals' represented by the recorded remains, and the figures given may include both positive and 'probable' identifications.

The manuscript lists and notes made during recording were entered to the University of York VAX mainframe computer and processed using a Pascal system written by HK, producing 'main statistics' and species lists in rank and taxonomic order for each assemblages, together with files of main statistics, species records and notes for the whole site. These were interrogated using the DATATRIEVE system.

The interpretative methods employed in this report are essentially those used for many sites by Kenward and co-workers (see Kenward 1978, with refinements discussed, for example, by Kenward 1982; 1988; Hall and Kenward 1990). The interpretation of assemblages rests on certain 'main statistics' of whole assemblages of adult beetles and bugs, and upon ecologically-related groups of species. The main statistics used include: a measure of species-richness (or diversity), Fisher *et al.s'* (1943) alpha, for the whole assemblage and for components of it; proportions of 'outdoor' species, aquatics, waterside species, phytophages (plant feeders), species associated with dead wood, moorland/heathland taxa, and decomposers (species associated with decomposing matter of some kind). The last category is subdivided into species associated primarily with rather dry habitats, those found mostly in rather, to very, foul habitats, and a residuum not easily assignable to one of these. The identification of an 'outdoor' component in what are sometimes clearly natural or semi-natural assemblages may appear curious, but is in fact useful when working with any deposits associated, even if rather indirectly, with human occupation. The index of diversity offers a useful indication of the presence or absence of autochthonous fauna (i.e. remains of insects which bred in or on the developing deposit), 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 alpha, while very specialised communities, such as those of decaying matter deposited by humans, or of stored grain, have low or very low ones.

A component of the assemblages referred to in this report is 'house fauna'. This is a group identified on the basis of archaeological records as apparently typical of primitive buildings housing people, stock, or stored organic material such as hay or straw. It is not necessarily suggested that they formed a single community; species living in timber, wattle, thatch, floors and stored products may be present in any particular case. The species are not likely to be found together today as a rule, since the habitats harbouring them have largely disappeared. This component of archaeological insect assemblages is discussed by Hall and Kenward (1990), Kenward and Hall (forthcoming) and, largely by allusion, by Kenward and Allison (in press).

A further group alluded to is that containing species which may be indicative of imported hay-like cut vegetation; this includes certain *Apion*, *Sitona*, and *Hypera* species and a variety of others.

## Results

A complete list of plant taxa recorded from the site is given in Table 1. The lists of plant taxa recorded from each sample are presented in Appendix 1 in sample/context order and statistics derived from these lists in Appendix 2 (the numbers of taxa, percentage taxa and AIV are shown for each group and within each set of groups the order is from highest AIV to lowest). The groups and scores used in Appendix 2 are explained in Appendix 3.

Evidence of intestinal parasitic worms was only recorded in a single case (sample 147); the negative results for all the other samples are not mentioned in the sample-by-sample account below.

A complete list of invertebrate taxa recorded from the site is given in Table 2. The species lists (in rank order) and main statistics for the insect assemblages which were scan-recorded or rapid-scanned are presented in Appendix 4. The use of main statistics for rapid-scan recorded groups is discussed by Kenward (1992); in short, the statistics may be used for interpretation, but with suitable caution.

## Archive

With the exception of a few extracted specimens, all the plant remains are stored in the flots (in IMS) or in oven-dried residues at the EAU. Paper and electronic records are also stored there.

The insect material from the processed samples is stored in IMS at the EAU. The manuscript records of identifications are also stored at the Unit.

The computer input files and processed 'database' files for the site are stored in the University of York central mainframe computer at the time of writing. A set of hard copies of the processed data for each sample is stored at the EAU.

## Review of results, sample by sample

The samples are considered in context order with archaeological comments from the excavator in brackets.

Context 7 [?occupation deposit/demolition; C13/14]

Mid grey-brown to dark grey, crumbly, slightly sandy silty clay with moderate amounts of wood to 60 mm, and traces of hazel (*Corylus avellana*) nutshell.

The small flot included moderate numbers of fly puparia, a few beetle fragments and a very few plant macrofossils. The residue consisted largely of wood fragments to 50 mm (including some fragments with clear evidence of cut faces/edges), and some twig fragments to 20 mm, together with a few more plant macrofossils. Amongst these were traces of wheat/rye (*Triticum/Secale*) 'bran' and corncockle (*Agrostemma githago*) seed fragments likely to have originated in flour or flour-based food. The remaining plant taxa were all typical weeds of disturbed soils consistent with occupation sites.

A small assemblage of adult beetles and bugs of the groups used in calculating 'main statistics' was recovered: 36 individuals of 31 taxa. Other invertebrate remains included 'many' fly puparia and mites, 'several' fly larvae and scale insects, a flea (not identifiable to species on the parts recovered) and a part of a poorly preserved louse abdomen, probably of *Pediculus humanus*, the human louse.

The beetles were rather well preserved in chemical terms, but many were very fragmented, with numerous tiny pieces of cuticle. This made identification difficult in many cases.

Main statistics for a group of this size can only be used with great caution. Over a quarter of the individuals were of 'outdoor' taxa, suggesting accumulation in an exposed place or importation of 'soil' or other materials. Decomposer taxa were moderately well represented (over half of the individuals), with a substantial proportion of 'dry' decomposers (about a fifth of the assemblage, although only seven individuals!).

There were four individuals of *Anotylus nitidulus*. Unfortunately the ecological significance of this species in archaeological assemblages is poorly understood. In addition, it may have been abundant in the 'background fauna' in many places in the past. Only two other taxa were represented by more than one individual (*Cryptophagus* sp. and *Lathridius minutus* group). These, together with some of the other recorded taxa, are seen as evidence of a strong human influence. Indeed, apart from the marine littoral *Cercyon depressus* (Hansen 1987) the whole assemblage would be unremarkable from, for example, Anglo-Scandinavian Coppergate, York (Kenward and Hall forthcoming; Hall and Kenward, forthcoming).

Beyond this clear influence of human beings the interpretation of this group is difficult. It may have formed in the open, with the addition of species from human ejectamenta. The scale insects may have been imported with branches used for wattle.

Context 50 [?open area build-up; C13/14]

Mid grey-brown, crumbly, sandy silty clay with traces of stones 2-20 mm, brick/tile, charcoal, wood, fish bone and a fleck of marine mollusc shell.

There was nothing but a trace of coal to 5 mm in the flot; the residue consisted mostly of coal to 10 mm and sand, with a little eroded fish bone.

Context 103 [context information not yet supplied]

Dark grey (with paler grey-brown to orange-brown patches or thin lenses), crumbly (working plastic), silty clay sand with much fine charcoal or soot.

There were a few identifiable plant remains in the tiny flot, the only one present as moderate numbers of seeds being toad-rush (*Juncus bufonius*), likely to have been blown or brought with mud on feet from plants growing on wet paths in the area. The remaining plant taxa offered little further interpretative information. The residue consisted mostly of sand and fine coal (to 15 mm) with a little fish and ?mammal bone.

There were very few insect remains - only single individuals of four taxa of adult beetles, and a single psyllid bug nymph. The beetles included three taxa typical of occupation deposits.

Context 129 [occupation deposit; C14/15]

Mid grey-brown with thin layers of orange-brown, crumbly to layered, working plastic, very humic, clay silt with traces of marine mollusc shell.

The small flot mainly comprised very decayed plant detritus with two individuals of probable weed taxa. The residue was mostly sand with much coal to 10 mm and a few fragments of bone.

Context 138 [occupation deposit; C14/15]

Buff, dark brown and orange, plastic, very slightly sandy silty clay with traces of charcoal and fish bone.

The flot and residue were unusual for this series of samples in being dominated by a single plant taxon: seeds of dyer's rocket or weld (*Reseda luteola*) were abundant in both. Other plant taxa included a few typical weeds of medieval urban occupation deposits and there was a little fish bone, some of it burnt. Charcoal to 10 mm was quite common in the residue.

Weld was an important dyeplant through the Middle Ages and into the early modern period, collected or grown for its strong yellow dye, typically obtained from the flowering spikes at the time of seed set. It is quite likely that the archaeological evidence for its use would be a concentration of seeds in a deposit containing dyebath waste. Unfortunately, however, it is a prolific seed producer and a common weed of disturbed places and is quite frequently recorded from medieval urban deposits where, as here, there is no supporting evidence for dyeing or other aspects of textile working, although sample 147 produced a hint (in the form of tentatively identified ectoparasites of sheep) that wool may have been processed on the site.

Context 145 [levelling/dump deposit]

Bright red-orange, crumbly more or less pure sand with traces of ?rotted bone, ?charcoal and marine mollusc shell.

The tiny flot yielded only a single very decayed rush (*Juncus* sp.) seed, the residue consisting of red-brown rotted sandstone and sand with a trace of charcoal to 10 mm.

Context 147 [occupation deposit; C14]

Mid grey-brown with thin layers of mid orange-brown, crumbly, layered, very humic silty sand with fine and coarse herbaceous detritus and traces of marine mollusc shell.

The flot and residue for the subsample of this sample examined were rather rich in plant remains. For the most part they were weeds of disturbed and cultivated soils, but there was a component of bracken (*Pteridium aquilinum*) stalk and frond fragments that was quite prominent. One likely explanation for this is that it represents litter from a floor but clearly there was a range of human occupation debris, for eggshell, eggshell membrane, cockle and mussel shell fragments, wood chips, fish bone, a fish otolith and charcoal were all present, the last of these in moderate amounts. The most abundant of the 'weeds' were *Atriplex* sp(p), *Brassica rapa*, *Anthemis cotula* and *Ranunculus sardous*, perhaps most likely to occur in gardens or waste places, but there were also some typical cornfield taxa (*Chrysanthemum segetum*, *Scandix pecten-veneris*). The only other 'useful' plants were flax or linseed, *Linum usitatissimum*, of which a single seed was recorded and bread/club wheat (*Triticum aestivo-compactum*), of which a single charred grain was noted. The presence of a single fruit of sea arrow-grass (*Triglochin maritima*) in a deposit formed so close to the sea is perhaps not surprising, although this taxon is recorded from Roman and medieval deposits as far inland as York, where it is thought possibly to have arrived in herbivore dung from animals grazed on coastal salt-marsh.

A single whipworm (*Trichuris* sp.) egg was recorded from the subsample examined for evidence of intestinal parasites. Such 'trace' amounts of eggs cannot be regarded as interpretatively significant.

The insect remains were chemically fairly well preserved, but were very fragmentary, with a large number of tiny pieces of cuticle which would have been prohibitively time-consuming to record. The material was accordingly rapid-scan recorded.

The assemblage was notable for the presence of 'many' human lice, *Pediculus humanus*. The identification of these was confirmed by the presence of male genitalia in two entire abdomens; they were identical to the material illustrated by Ewing (1932). Both adults and nymphs were present.

In addition to the human lice there were remains of an adult and a puparium of what appeared to be the sheep ked *Melophagus ovinus*, and two *Damalinea* sp. lice, perhaps also from sheep.

There were about 39 adult beetles of 35 taxa. Clearly caution must be exercised in interpreting so small a group, but it included some characteristic elements. A fifth of the remains were of 'outdoor' taxa. Some of these may, *conceivably*, have been imported in cut, hay-like, vegetation, but this is highly speculative. Two thirds of the assemblage was contributed by decomposers, a substantial proportion of these being typically associated with relatively dry habitats. *Atomaria nigripennis*, with three individuals the most abundant taxon, is a strong synanthrope associated in archaeological deposits with a group of species regarded as typical of buildings ('house fauna', see above). Here it was found with several other taxa of similar affinities: *Xylodromus ?concinus*, *Mycetaea hirta*, *Aglenus brunneus*, *Tenebrio obscurus* and *?Blaps* sp. being particularly significant. Other component of the fauna, if they lived *in situ*, indicate rather more foul conditions.

#### Context 161 [occupation deposit; C14]

Dark grey to mid orange-brown (with evidence of oxidation), crumbly (working just plastic), slightly sandy clay silt with traces of stones 6-20 mm, wood fragments, fish scale and marine mollusc shell.

There was a small assemblage of plant remains in the flot and residue, most of them weeds and other plants typical of medieval urban occupation deposits. *Pteridium* stalk and frond fragments were again present, and there was a single fragment of a flax seed capsule and two seeds of this plant. The presence of cereal/grass stalk and leaf/stem epidermis fragments perhaps indicates that this deposit, too, contained litter. The residue consisted mostly of decayed (including ?worked) wood fragments, quartz sand and other plant detritus

Insects were not very abundant; there were 31 individuals of 25 beetle and bug taxa of the groups used in calculating statistics, while other remains included an unidentifiable flea. There were also 'many' mites. A large proportion of the fossils were fragmentary.

Apart from the substantial proportion of decomposers (two thirds) the main statistics were unremarkable in view of the small size of the assemblages.

There were three *Cercyon depressus*, associated with organic litter, especially wrack, at the high tide line. Other remains were primarily of species likely to occur in or around buildings, but there were single specimens of *Ulopa reticulata* and *Bradycellus ruficollis*, associated with heath/moor vegetation, where there is heather (*Calluna vulgaris*). These were perhaps imported with cut vegetation.

#### Context 165 [?marine deposits; C14]

Mid grey-brown, crumbly (working plastic), sandy clay silt with herbaceous detritus, traces of stones 20-60 mm and moderate amounts of wood fragments.

The small assemblage of plant remains from the flot and residue included moderate amounts of bracken stalk, especially in the 2-4 mm fraction. There was some grass 'chaff'



and stalk material, perhaps also from litter. A half-achene of hemp (*Cannabis sativa*) and a few weed and other taxa made up the rest of the assemblage.

Insect remains were rare (N = 14; S = 12) and often highly fragmentary. There were 'many' mites, 'several' fly puparia, and assorted other remains including unidentifiable fragments of a flea. Several taxa associated with human occupation were recorded, but little could be made of this group.

This was clearly not a purely 'marine' deposit; indeed, the biota gave no evidence at all for such an origin.

#### Context 166 [?marine deposits/?ditch fill]

Slightly heterogeneous, slightly orange, mid brown (with some lumps of grey clay and patches of black oxidised sandy material), sandy silt with traces of stones 2-6 mm and abundant charcoal to 15 mm; some roots present which might be ancient.

Bracken stalk and frond fragments were again moderately frequent in this sample and fragments of grass 'chaff' and probably also vegetative fragments points again to a component of probable 'litter'. Weeds were also quite frequent and diverse, and there was a further half-achene of hemp and a seed of flax. A few mosses were present, mostly represented by only one or two shoot fragments. These were all of the larger, branched kinds frequently recorded from urban archaeological deposits and likely to have been used in buildings or for sanitary purposes. These, and the presence of heather or ling (*Calluna vulgaris*) shoot fragments and a flower capsule, may merely indicate another component of the litter evidenced by the bracken, however.

Few invertebrates were present. There were 'many' mites, 'several' fly puparia, a probable sheep ked (*Melophagus ovinus*) and a flea, assorted other remains and 22 individuals of 21 beetle and bug taxa. Chemical preservation was variable, and the remains were rather fragmentary.

'Outdoor' forms were proportionally abundant (over a third of the individuals) and decomposers not well represented (about two-fifths of the assemblage). Only *Anotylus nitidulus*, a possible background element, was represented by more than one individual (there were two). There were some species typical of human occupation sites but no clear interpretation could be made.

Taking the biota as a whole, there is nothing to suggest that this deposit is other than occupation build-up.

#### Context 167 [?marine deposits/?ditch fill, above natural]

Black to mid orange-grey-brown to buff (with darker/paler coloration resulting from oxidation/reduction), plastic (with some thin beds of more or less pure pale grey-brown clay), slightly sandy silty clay with traces of stones 2-6 mm and of marine mollusc shell.

The tiny flot gave only a few identifiable plant remains, mostly weeds. There was a little bark and mussel shell (both to 30 mm) in the residue, but otherwise this consisted only of decayed wood and sand.

The small biota recorded suggests that this deposit probably formed sub-aerially; it was certainly not primarily a marine deposit.

Context 206 [demolition build-up; C14/15]

Mid grey-brown with orange- and purplish-brown blotches, crumbly (working plastic), slightly sandy silty clay, with traces of stones 2-6 mm, coal, mammal bone, and marine mollusc, and moderate amounts of charcoal.

There were single seeds of toad-rush and a poppy species in the flot; the residue consisted of sand and angular gravel (to 25 mm), with fish bone to 25 mm and some coal to 15 mm.

### Discussion

The unavoidably very limited scale of excavation placed severe limits on the potential of the biological remains as a source of information about ecological conditions and human activity on the site. Bulk-sieving of the more substantial contexts might well have provided considerably more information had it been feasible. The financial constraints of the project meant that larger samples could not be processed for plant and insect remains; had this been possible, assemblages - particularly of insects - of clearer interpretative significance would perhaps have been recovered.

Two particular aspects of the evidence recovered are worthy of further discussion. The first of these is the presence in several samples of both plant and insect remains suggestive of litter - in the sense of dryish coarse straw-like plant debris. The bulk of this is in the form of bracken stalk and pinnule fragments, but there was some grass-like detritus in 165, for example. Amongst the insect assemblages, there were small quantities of 'house fauna' (see especially context 147). The traces of heather in 166 might also be part of this 'litter' component and heather-associated insects were recorded from 161, although there were no remains of the plant there. Sample 147 also gave a weak hint of hay-like cut vegetation from the insects, but the tenuousness of the argument here must be emphasised.

Samples 165, 166, 167 were from cuts thought by the excavator to have fills perhaps of marine origin. Apart from a single sea arrow-grass (*Triglochin maritima*) fruit in the sample from 147, small numbers of *Cercyon depressus* from contexts 7 and 161, and the marine mollusc shell from several samples, there was no clear evidence for deposition of marine sediment. In particular there were no examples of small marine invertebrates or calcareous algae, both of which might be anticipated to be present had sea water deposited fine sediment here. The marine influence indicated by *Cercyon depressus* is hardly surprising bearing in mind the location of the sites. These beetles may have lived on the site in organic matter which had been flooded by salt water, but they may equally have had a background origin. A single specimen of *C. depressus* was found in deposits at the crannog

site at Buiston, Ayrshire (Kenward *et al.* 1993) and considered to have been of background origin; that this beetle may be abundant in deposits laid down by salt water is clear from records of large numbers of individuals from the Chapel Lane Staith site in Hull (Kenward 1979). The lack of other 'wrack' taxa (Backlund 1945) at Baxtergate suggests a background origin to be quite likely.

In general, where preservation was sufficiently good, and where there were adequate numbers of remains, the samples from this site appeared to be from occupation deposits. In particular, the presence of many human louse remains in the sample from the occupation deposit 147 strongly suggests that this was either a floor layer or was an accumulation which received sweepings from such a layer.

The fragmented nature of much of the insect material, combined with about average chemical preservation, is of note. The remains may have been crushed by trampling during deposition, but such damage might have resulted from recent drying out of the deposits or compression by heavy plant.

The sheep keds, unfortunately only tentatively identified, and the associated *Damalinea* lice, may have come from wool that was cleaned on the site, but too few remains were present for any definite origin to be identified.

The rather limited information obtained from this investigation should not act as a discouragement to further investigation of biological remains from sites in Whitby. This material has proved the potential for preservation in many sites in at least parts of the town. Whitby is of interest as a representative of small towns somewhat isolated by land but with good sea communications: a likely entry point for trade materials and accidentally imported alien plants and animals. In addition, it is as important from an historical point of view to understand conditions in small towns like Whitby as well as in grander ones such as York, London and Carlisle.

It is important that intensive sampling is undertaken during any further excavations in Whitby; it is better to collect material and subsequently reject it following assessment than to collect too selectively and lose potentially important material.

Table 1. Plant taxa recorded from excavations at 63-4 Baxtergate, Whitby (WB2). The parts recorded can be determined from Appendix 2. Nomenclature follows Tutin et al. (1964-80) and Smith (1978).

### Vascular plants

*Pteridium aquilinum* (L.) Kuhn (bracken)  
*Alnus glutinosa* (L.) Gaertner (alder)  
*Corylus avellana* L. (hazel)  
*Cannabis sativa* L. (hemp)  
*Urtica dioica* L. (stinging nettle)  
*Polygonum aviculare* agg. (knotgrass)  
*P. persicaria* L. (persicaria/red shank)  
*P. lapathifolium* L. (pale persicaria)  
*Rumex* sp(p). (docks)  
*Rumex acetosella* agg. (sheep's sorrel)  
 Chenopodiaceae (goosefoot family)  
*Chenopodium album* L. (fat hen)  
*Atriplex* sp(p). (oraches)  
*Agrostemma githago* L. (corncockle)  
*Ranunculus* Section *Ranunculus*  
 (meadow/creeping/bulbous buttercup)  
*R. sardous* Crantz (hairy buttercup)  
*R. flammula* L. (lesser spearwort)  
*Papaver argemone* L. (long prickly-headed  
 poppy)  
*Thlaspi arvense* L. (field penny-cress)  
*Brassica rapa* L. (turnip)  
*Reseda luteola* L. (weld/dyer's rocket)  
*Rubus fruticosus* agg. (blackberry/bramble)  
*Rosa* sp(p). (roses)  
*Potentilla* cf. *reptans* L. (?creeping cinquefoil)  
*Aphanes microcarpa* (Boiss. & Reuter) Rothm.  
 (slender parsley-piert)  
 Leguminosae (pea family)  
*Linum usitatissimum* L. (cultivated flax/linseed)  
*Viola* sp(p). (violets/pansies, etc.)  
*Scandix pecten-veneris* L. (shepherd's needle)  
*Aethusa cynapium* L. (fool's parsley)  
*Conium maculatum* L. (hemlock)  
*Calluna vulgaris* (L.) Hull (heather, ling)  
*Anagallis arvensis* L. (scarlet pimpernel)  
*Myosotis* sp(p). (forget-me-nots)  
*Galeopsis* Subgenus *Galeopsis* (hemp-nettles)  
*Prunella vulgaris* L. (selfheal)  
*Hyoscyamus niger* L. (henbane)  
*Solanum nigrum* L. (black nightshade)  
*Sambucus nigra* L. (elder)  
*Knautia arvensis* (L.) Coulter (field scabious)  
 Compositae (daisy family)  
*Anthemis cotula* L. (stinking mayweed)  
*Chrysanthemum segetum* L. (corn marigold)  
*Carduus/Cirsium* sp(p). (thistles)  
*Lapsana communis* L. (nipplewort)  
*Triglochin maritima* L. (sea arrowgrass)

*Juncus* sp(p). (rushes)  
*Juncus bufonius* L. (toad rush)  
 Gramineae (grasses)  
 Gramineae/Cerealia (grasses/cereals)  
*Triticum aestivo-compactum* (bread/club wheat)  
*Triticum/Secale* (wheat/rye)  
*Danthonia decumbens* (L.) DC. in Lam. & DC.  
 (heath grass)  
*Carex* sp(p). (sedges)

### Mosses

*Sphagnum* sp(p).  
*Dicranum* sp(p).  
*Neckera complanata* (Hedw.) Hüb.  
*Thuidium tamariscinum* (Hedw.) Br. Eur.  
*Calliergon cuspidatum* (Hedw.) Kindb.  
*Homalothecium sericeum/lutescens*  
*Hypnum* cf. *cupressiforme* Hedw.  
*Rhytidiadelphus triquetrus* (Hedw.) Warnst.  
*Hylocomium splendens* (Hedw.) Br. Eur.

Table 2. Complete list of invertebrate taxa recorded from 63-4 Baxtergate, Whitby (WB2). Conventions: 'sp(?)' - indicates probable additional taxon; 'sp(?) indet.' - indicates may be (or include) previously listed taxon or taxa. Order and nomenclature for Insecta follows Kloet and Hincks (1964-77).

DERMAPTERA		<i>?Pterostichus</i> sp.	ob
Dermaptera sp.		<i>Bradycellus ruficollis</i> (Stephens)	oa-m
		Carabidae spp. indet.	ob
MALLOPHAGA		<i>Helophorus aquaticus</i> or <i>grandis</i>	oa-w
		<i>Helophorus</i> sp.	oa-w
<i>Damalinia</i> sp.		<i>Cercyon atricapillus</i> (Marsham)	rf
		<i>C. depressus</i> Stephens	rf
SIPHUNCULATA		<i>Cercyon</i> sp.	u
		<i>Ochthebius</i> sp.	oa-w
<i>Pediculus humanus</i> Linnaeus		<i>Ptenidium</i> sp.	rt
		<i>Acrotichis</i> sp.	rt
		<i>Megarthus</i> sp.	rt
HEMIPTERA		<i>Phyllodrepa ?floralis</i> (Paykull)	rt
		<i>Omalium ?rivulare</i> (Paykull)	rt
		<i>Omalium</i> sp.	rt
<i>Ulopa reticulata</i> (Fabricius)	oa-p-m	<i>Xylodromus concinnus</i> (Marsham)	rt
<i>Auchenorhyncha</i> sp.	oa-p	Omalinae sp.	u
Psylloidea sp.	oa-p	<i>Platystethus ?nitens</i> (Sahlberg)	oa-d
Psylloidea sp. (nymph)		<i>Anotylus complanatus</i> (Erichson)	rt
Coccoidea sp.		<i>A. nitidulus</i> (Gravenhorst)	rt-d
		<i>A. rugosus</i> (Fabricius)	rt
		<i>A. sculpturatus</i> group	rt
DIPTERA		<i>Oxytelus sculptus</i> Gravenhorst	rt
		<i>Rugilus</i> sp.	rt
<i>?Melophagus ovinus</i> (Linnaeus) (adult)		<i>Gyrohypnus ?angustus</i> Stephens	rt
<i>?M. ovinus</i> (puparium)		<i>Gyrohypnus</i> sp. indet.	rt
Diptera spp. (adult)		<i>Xantholinus glabratus</i> (Gravenhorst)	rt
Diptera sp. (larva)		<i>Xantholinus</i> sp.	u
Diptera spp. (puparium)		<i>Philonthus</i> spp.	u
		Staphylininae spp.	u
		Aleocharinae spp.	u
SIPHONAPTERA		<i>?Geotrupes</i> sp.	oa-rf
		<i>Aphodius granarius</i> (Linnaeus)	ob-rf
Siphonaptera sp.		<i>Aphodius</i> sp.	ob-rf
		?Melolonthinae/Rutelinae/Cetoninae sp.	oa-p
		<i>Clambus</i> sp.	rt
HYMENOPTERA		Elateridae sp.	ob
		<i>Anobium punctatum</i> (Degeer)	l
Hymenoptera Parasitica sp.		<i>Ptinus</i> sp.	rd
Hymenoptera sp.		<i>Lyctus linearis</i> (Goeze)	l
		<i>Monotoma</i> sp.	rt
		<i>Cryptophagus</i> spp.	rd
COLEOPTERA		<i>Atomaria nigripennis</i> (Kugelann)	rd
		<i>Atomaria</i> spp.	rd
<i>Trechus ?micros</i> (Herbst)	u	<i>?Ephistemus globulus</i> (Paykull)	rd
<i>Bembidion ?properans</i> Stephens	oa	<i>Mycetaea hirta</i> (Marsham)	rd
<i>B. lampros</i> or <i>properans</i>	oa	<i>Lathridius minutus</i> group	rd
<i>Pterostichus melanarius</i> (Illiger)	ob	<i>Corticaria</i> spp.	rt

Cisidae sp.	l
<i>Aglenus brunneus</i> (Gyllenhal)	rt
? <i>Blaps</i> sp.	rt
<i>Tenebrio obscurus</i> Fabricius	rt
Salpingidae sp.	l
Cerambycidae sp.	l
Chrysomelinae sp.	oa-p
<i>Longitarsus</i> sp.	oa-p
? <i>Chaetocnema concinna</i> (Marsham)	oa-p
<i>Apion</i> sp.	oa-p
? <i>Sitona</i> sp.	oa-p
Coleoptera spp.	u
Coleoptera sp. (larva)	

Insecta sp. (larva)

#### ARACHNIDA

Acarina sp.  
 Aranae sp.  
 Pseudoscorpiones sp.

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