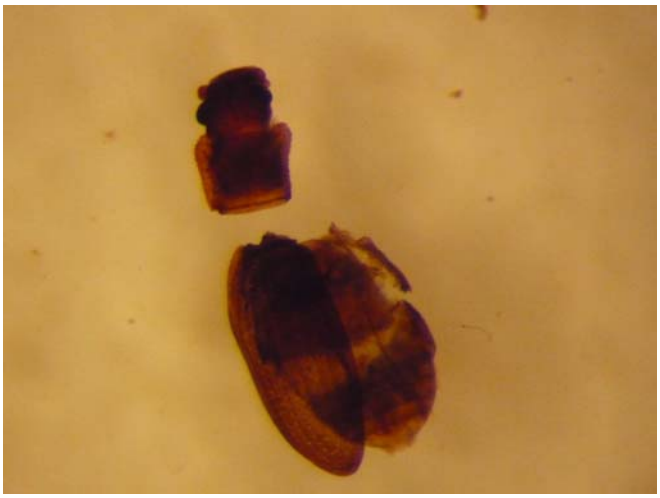
Hrönn Konráðsdóttir

Archaeoentomological analysis of samples from the 2008 season of Skriðuklaustur excavation



Skýrslur Skriðuklaustursrannsókna XXI

2009

Index

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Skýrslur Skriðuklaustursrannsókna XXI.
Ritstjóri skýrsluraðar: Steinunn Kristjánsdóttir.
Útgefandi: Skriðuklaustursrannsóknir.
Útgáfustaður: Reykjavík.

Forsíðumynd: *Latridius pseudominutus* (Strand), a minute mould feeding beetle (ljósm. Hrönn Konráðsdóttir).

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1. Project aim

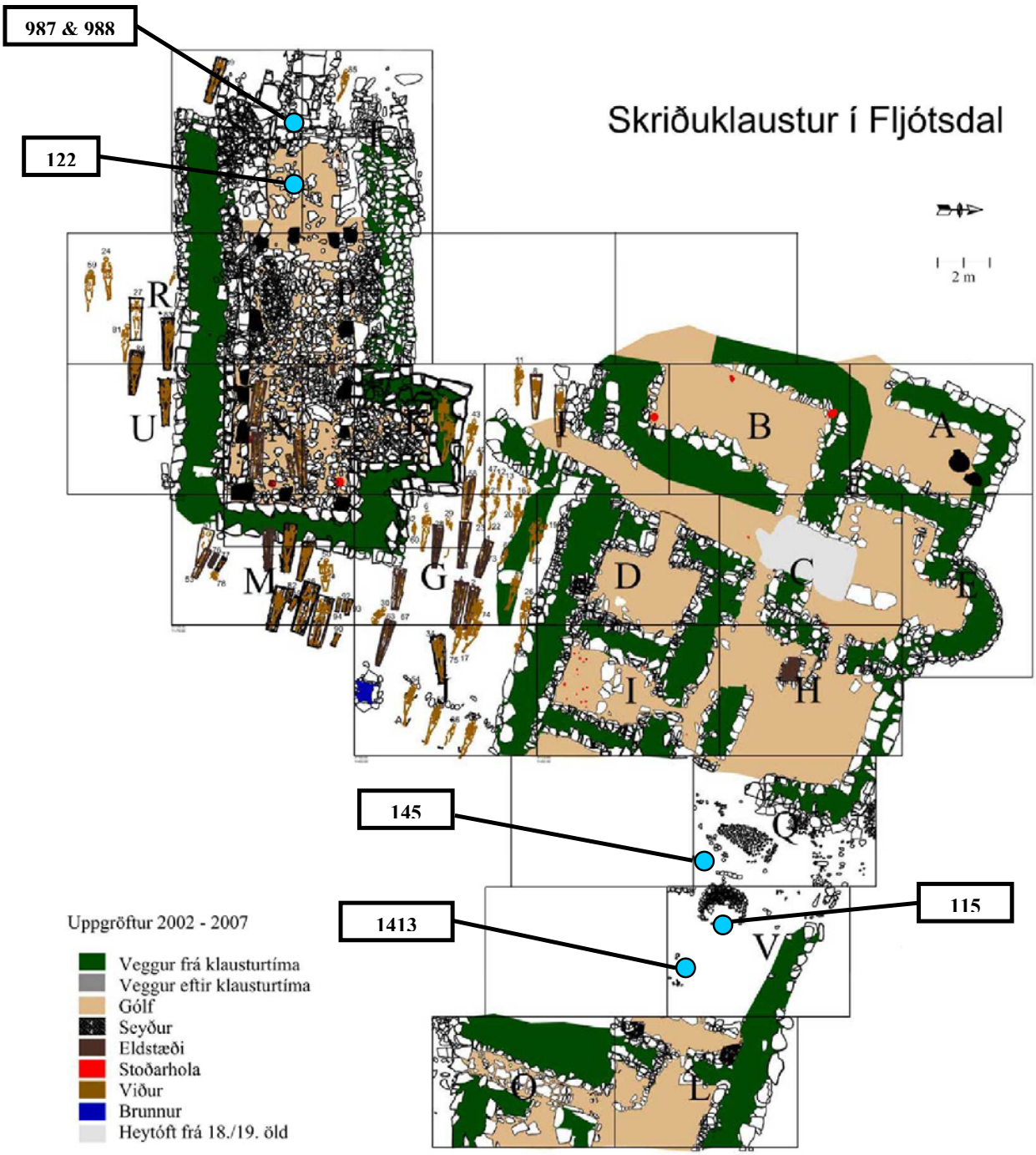
This project was an extension of the work done in the previous winter, where samples from various rooms at the site were analysed in order to get a general idea of what activities the rooms were used for as well as some idea of the local environment (Konráðsdóttir 2008). Five samples from the areas that were excavated in 2008 were processed and the insect remains in them identified. These were mainly floor layers as they have been proven to produce the best results and they usually provide the best representation of the room itself.

2. Methods

This season five samples were processed and the insect remains in them identified. Only one sample from each of the contexts that were of interest was analysed. The samples position inside the excavation is shown on figure 1, although this seasons illustrations have not been computerized so the areas are not all clear yet. The samples this year came from areas V, Q and ST, which are the areas from where floor layers were recovered this season. An effort was made to take large enough samples, or at least 5 litres, although this was unfortunately not possible in all cases. The sample sizes are illustrated in table 1, but samples 987 and 988 were processed as one sample as they came from the same context, just from two different places in the same floor. Sample 115 came from a ash layer inside the house and was too small to get more than 2 litres from and sample 112 was from a drain inside the church which yielded an even smaller sample, only 0,4 litres.

Sample	Size (L)
115	2
122	0,4
145	5
987/988	5
1413	5

Table 1. The size of each sample



Picture 1. Plan of the excavation after the 2007 season (by Ragnheiður Gló Gylfadóttir) and the location of the samples in sky blue that were used for archaeoentomological analysis.

The samples were floated with paraffin flotation at the Skriðuklaustur lab, where the insect remains were also sorted using a stereo microscope on loan from Egilsstaðir's high school (Menntaskólinn á Egilsstöðum). The insect remains were then identified in Reykjavik at the Icelandic Institute of Natural History with the use of the modern entomological collection, and were also quantified using MNI (Minimum Number of Individuals).

3. Results

The number of insect remains in the samples was obviously connected to the size of the sample, which reinforces the view that the samples need to be as close to 5 litres as possible. This of course is not a guarantee of a good result from these samples, as is apparent in samples 987 and 988 which despite being 5 litres in all have a very limited fauna and the number of individuals is also quite small. Table 2 illustrates the species in each of the five samples and their MNI count. The number of individuals from all five samples was 626 which is large enough to be useful for this sort of research. Sample 145 had the highest number of individuals, a total of 394 but it did not have the variety of species that sample 1413 had. The most numerous species was *Corticaria elongata* (Gyll.) which was also the most common species in the previous research (Konráðsdóttir 2008) and is a small mould feeding beetle (Larsson & Gígja 1959). The preservation varied although it was rather good in most cases. The insect remains from samples 987 and 988 were quite corroded, possibly because of the chemical composition of the soil or other non specific taphonomic reasons.

Species	145	115	987 & 988	122	1413		Sum:
Coleoptera							
Carabidae							
Nebria rufescens (Ström.)	1		1	1			3
Patrobus sp.			1				1
Amara quenseli (Schön.)	1				1		2
Dytiscidae							
Hydroporus nigrita (F.)					1		1
Staphylinidae							
Omalium excavatum Steph.	8		4	1	4		17
Omalium sp.					1		1
Xylodromus concinnus (Marsham)	52	4	3		7		66
Stenus nanus Steph.	1						1
Stenus sp.			2		1		3
Bisnius sordidus (Grav.)	1						1
Philonthus sp.		1			4		5
Quedius mesomelinus (Marsham)	1						1
Atheta spp.	10				14		24

Oxypoda sp.	7	3	1				11
Oxypoda spp.					6		6
Aleocharinae indet.		5	1				6
Byrrhidae							
Byrrhus fasciatus (Forst.)					1		1
Cryptophagidae							
Cryptophagus scanicus (L.)					1		1
Cryptophagus sp.					2		2
Atomaria sp.	59	1		1	9		70
Lathridiidae							
Latridius minutus (L.)	3						3
Latridius pseudominutus (Strand)	4	1			1		6
Latridius sp.	29				27		56
Corticaria elongata (Gyll.)	196	7			22		225
Mycetophagidae							
Typhaea stercorea (L.)	15	15	1		55		86
Endomychidae							
Mycetaea subterranea (Marsham)	1						1
Ptinidae							
Tipnus unicolor (Pill. & Mitt.)	1				3		4
Scarabaeidae							
Aphodius lapponum Gyll.	1			1			2
Curculionidae							
Otiorhynchus arcticus (O. Fabricius)	3				1		4
Otiorhynchus nodosus (Müll.)		1		1	2		4
Otiorhynchus sp.			1				1
Diptera							
Hippoboscidae							
Melophagus ovinus (L.)					3		3
M. ovinus puparia					8		8
Sum:	394	38	15	5	174		626

Table 2. MNI of each species in the samples

Again it is obvious which sample was the smallest and the usability of such small samples is questionable compared to the time it takes to sort them and process. As in the previous report the species were categorized into their preferred habitats and into synanthropic and non-synanthropic species (those who are limited to human habitats in Iceland and those that are not), as is illustrated in table 3. This was done to give a general idea of the environment from where they came and to assist with the interpretation of the archaeological material. The categorization was supported by the relevant literature and BugsCEP eco-codes (Buckland & Buckland 2006).

Species	**Synanthropic**	**Habitat**
N. rufescens	no	eurytopic
Patrobus sp.	no	wetland/meadow
A. quenseli	no	Sparse vegetation
H. nigrita	no	water

O. excavatum	yes	dung/foul
Omalium sp.	no	moulding refuse
X. concinnus	yes	dung/foul
S. nanus	no	meadow
Stenus sp.	no	eurytopic
B. sordidus	yes	moulding refuse / dung
Philonthus sp.	no	eurytopic
Q. mesomelinus	yes	moulding refuse
Atheta spp.	no	eurytopic
Oxypoda sp.	no	eurytopic
Oxypoda spp.	no	eurytopic
Aleocharinae indet.	no	eurytopic
B. fasciatus	no	Moss
C. scanicus	yes	moulding refuse
Cryptophagus sp.	yes	moulding refuse
Atomaria sp.	yes	moulding refuse
L. minutus	yes	moulding refuse
L. pseudominutus	yes	moulding refuse
Latridius sp.	yes	moulding refuse
C. elongata	yes	moulding refuse
T. stercorea	yes	moulding refuse
M. subterranea	yes	moulding refuse
T. unicolor	yes	dry moulding refuse
A. lapponum	no	Dung
O. arcticus	no	meadow
O. nodosus	no	meadow
Otiorhynchus sp.	no	meadow
M. ovinus	yes	parasite
M. ovinus puparia	yes	parasite

Table 3. General habitat of the species involved in the samples

Synanthropic insects were in majority of the individuals in most of the samples, which is understandable as the samples were all taken from inside buildings (Figure 1). For a clearer picture of the percentage of indoor species and distribution of habitats figures 1 and 2 show these as a percentage of the number of individuals in each of the samples.

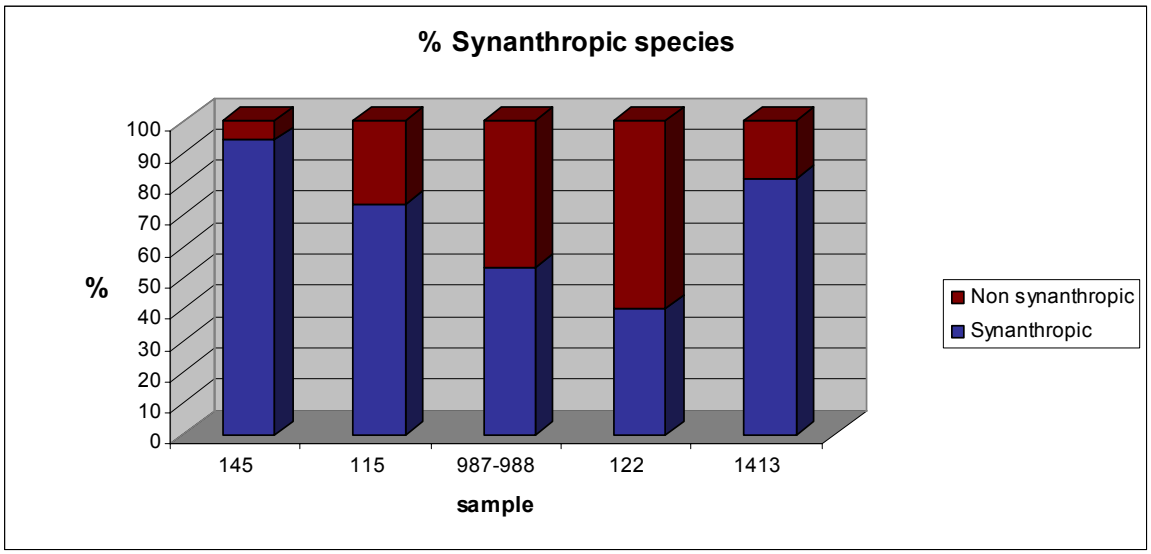


Figure 1. Percentage of synanthropic species in each of the samples

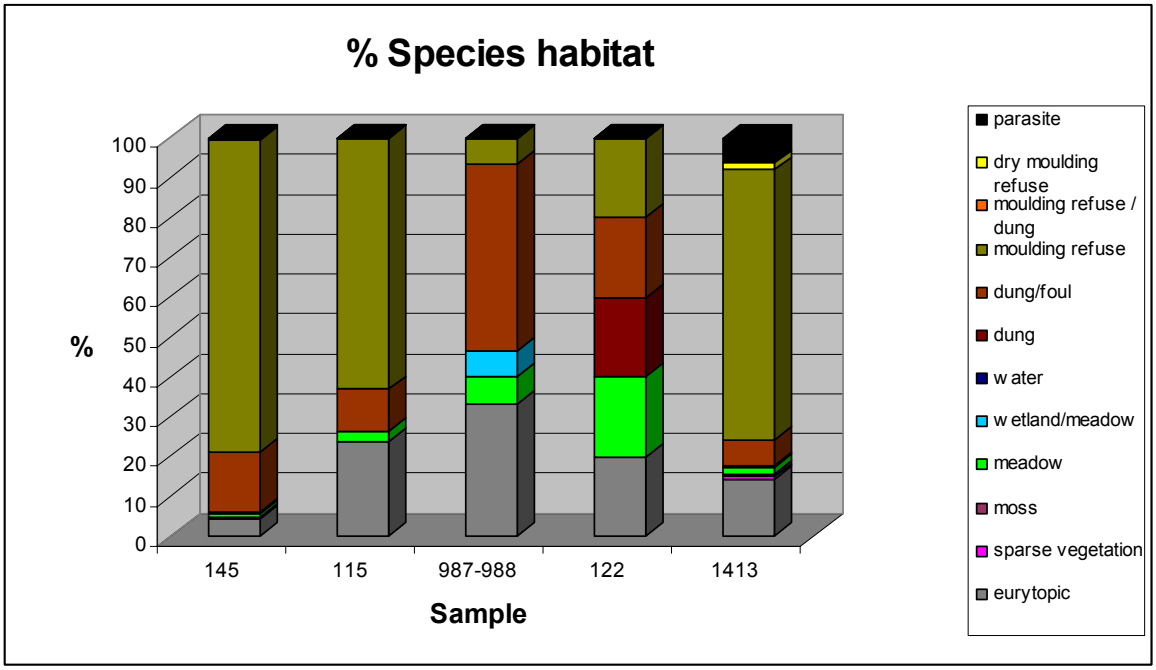


Figure 2. Percentage from each habitat in each of the samples

Area V samples 115 and 1413

The room in area V is thought to have been a kitchen, and the presence of a large fireplace in the west end of the room supports this idea. The room was filled with rubbish layers, and as the hope for a usable floor layer faded samples were taken from an ash layer and from a rubbish layer which were then processed and analysed for insect remains. At the end of the season the floor appeared and samples were taken from this, but they have not been processed as it was to late in

the season to be able to finish the work for this sample. At this point the other two will have to do for the interpretation of the room but hopefully there will be a chance later to analyse the floor samples as well.

Sample 115 was not as rich as 1413, but most of the fauna were synanthropic minute beetles that prefer habitats in moulding refuse. Sample 115 came from an ash layer just outside of the fireplace and this could be the reason why the fauna was limited, fireplaces are perhaps not the best areas to take samples from as the insects avoid these environments and when they do end up there they become charred and are therefore often difficult to identify. In this case the insect remains found were not charred, which could also indicate that they were a later introduction in the layer. The minute beetles found were *T. stercorea*, *C. elongata*, *L. pseudominutus*, *X. concinnus* and Atomaria which could not be identified down to species. These are mostly recognized as being found in old hay barns in Iceland (Lindroth et al. 1973; Larsson & Gígja 1959), but one can assume that this means that they are also found in other moulding organic material. Apart from the synanthropic species there were a few eurytopic ones as well as *O. nodosus* which is common in grasslands and heaths.

The second sample analysed for this room, sample 1413, was quite a lot richer, both in species and number of individuals. The sample was taken from a layer inside the room which contained animal bones and looked similar to others above that had been excavated in this room, but they were all above the floor layer and looked like they could be midden layers. This sample had a rather large number of fly puparia which indicates that flies were breeding in the material from where it came. The majority of the fauna was synanthropic, mostly the minute mould feeding beetles that were also in the former sample and a few more that live in the same environment, as *C. scanicus*, *O. excavatum*, species of Latridius and Cryptophagus as well as *T. unicolor*. The last one prefers rather dry mouldy environments (Warsop & Skidmore 1998) and the conclusion would be that these indicate quite dry environment inside the room, but moulding organic material, fungus and spores must still have been plentiful. Another species from this sample that is intertwined with human abodes is the sheep ked, *M ovinus*. As a ectoparasite on sheep it could have come into the room with wool or with the sheep themselves. But with so few individuals they might have come by any means, although wool is a very likely way of introduction it cannot be assumed that this is the case here. Other species in this sample are indicators of grasslands, moss and sparse vegetation as well as there was one species found that lives in freshwater of most kinds, *H. nigrita*, which may have come into the room with water, perhaps used for cooking or drinking.

Area Q, sample 145

Area Q was situated next to area V and it contained a room and a hallway. One sample was processed from this area, a very organic and compact sample much like the richest samples from the previous research which looked like compact grass residue. It was also rich and as a matter of fact it was the richest sample analysed in this years collection. The sample was dominated by minute mould feeding beetles (Figure 2), of which *C. elongata* was the most abundant. Other small mould feeding beetles included *X. concinnus*, *T. stercorea*, *M. subterranea*, *L. minutus* and *pseudominutus* as well as the spider beetle *T. unicolor* all of which are particularly common in hay barns (Larsson & Gígja 1959) but the last one keeps away from very wet conditions (Warsop & Skidmore 1998). There must therefore have been quite a lot of decaying plant waste inside the room, but again rather dry. Three other synanthropic species were in this sample, *Q. mesomelinus, B. sordidus* and *O. excavatum* which are not infrequent in manure, but are common in all sorts of moulding organic material (Larsson & Gígja 1959). In addition one *A. lapponum* was recovered from this sample, which is the dung beetle which lives in the dung of large mammals (Larsson & Gígja 1959). Other species from this sample were ones that are found in rather dry environments and sparse vegetation as *A. quenseli* (Larsson & Gígja 1959) and the rather rare species in Iceland *S. nanus* which is found both in dry and moist environments (Larsson & Gígja 1959).

Area ST, samples 122 and 987/988

Two samples were taken from the church floor, one from a drain and the other from underneath flagstones in the floor. Neither produced good results but as sample 122 was only 0,4 litres it was by far the worse of the two and therefore a good example of why samples should be 5 litres if possible. This sample was from a drain inside the church and there was not a lot in it. It contained very few individuals of only five species, two of which are synanthropic and are mostly found in plant waste (Larsson & Gígja 1959), *O. excavatum* and a species of Atomaria that could not be analysed down to species. In addition there was also the dung beetle, but as there is only one individual in the sample and the species can fly quite well this has little bearing on the interpretation. Other species are eurytopic and grass dwelling species.

The second sample was from the church floor underneath large flagstones. Sample 987/988 was larger and had more species in it but only four that have any bearing on the interpretation as the rest could not be identified down to species and the genus have varied habitats. Three of the species were synanthropic and are the same as have been found in other

rooms in the complex, they are *T. stercorea*, *X. concinnus* and *O. excavatum*. There was also the eurytopic and non-synanthropic species *N. rufencens* in this sample. The synanthropic species indicate that there was some sort of moulding organic refuse in the church floor, perhaps dropped there by the churchgoers or inhabitants.

4. Conclusions

Hopefully there will be a chance later to process the floor sample from the room in area V as it has the potential to yield interesting results, coming from what is supposed to be the kitchen of the complex. The fauna vas predominantly synanthropic which is exactly what one would expect from this sort of material. The results were also quite similar to the former research, and what is most apparent is that the conditions, as before seem to be rather that of dry mouldy environment than damp one, which indicates that these rooms were well isolated from the rain and snow outside.

The rooms that were analysed this season were two adjoining rooms in areas Q and V as well as the church floor. The church floor did not yield much and it is likely that this is because it was covered in flag stones and therefore the best sample material may have been in-between the stones and therefore was lost when the stones were taken off. But there were still some mould feeding beetles in the floor and they do indicate some sort of organic material inside the church. Rooms in both Q and V were quite similar, with a lot of synanthropic minute beetles. The floor layer from area Q was very similar to what was in area H, which was the room next door and this of course is not surprising. The consistency also indicates that there was grass on these floor, perhaps old hay, which is the most common habitat of the majority of the fauna recovered from these two rooms. The floors would probably also be covered in grass to keep them dry and this coincides with the recovery of insects that prefer dry mouldy conditions. The samples from area V were taken from different types of rubbish layers. The ash layer had some synanthropic species but was not very rich. The other rubbish layer on the other hand was quite rich and in addition to the minute mould feeding beetles there were a few sheep ked which indicate that there might be sheep at the site or at least their wool.

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