Discerning beetles, an entomo-archaeological study of coleopteran faunas in relation to place and time

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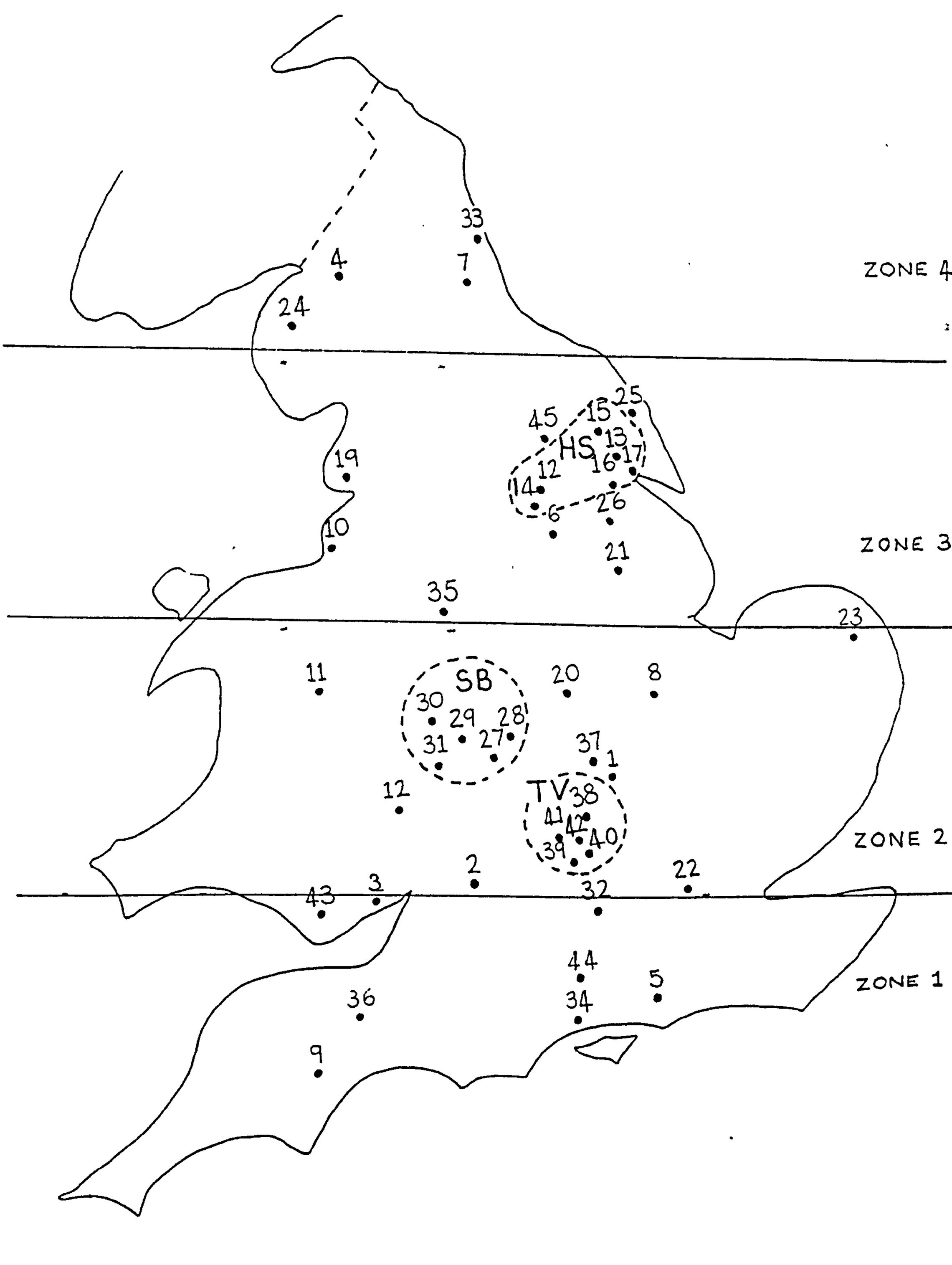
Fig. 5.1: Map of England and Wales, showing the locations of the sites at which entomological material, of Roman to post medieval date, has been studied (Sites with very small assemblages have been omitted).
See following page for key to site names and Table 5.1 for further details of each site.



Key to the names of the sites on the map (Fig. 5.1). The sites grouped on the map are indicated by the group suffix.

No.	Place	Author	Date
1	Bancroft, Bucks.	Pearson & Robinson	1994
2	Barnsley Park, Glos.	Coope & Osborne	1968
3	Caerwent, Mon.	Amsden & Boon	1975
4	Carlisle-LELA, Cum & West	Kenward *et al.*	1992a
4	Carlisle-OGLA, Cum & West	Kenward *et al.*	1992b
4	Carlisle-OGLB, Cum & West	Kenward *et al.*	1992c
5	Chichester-Market, W.Sx.	Girling	1989
6	Doncaster, S.Yorks	Smith	1989
7	Durham	Kenward	1979a
8	Empingham, Rutland	Buckland	1986
9	Exeter, Devon	Straker *et al.*	1984
10	Fazakerley, Merseyside	Hall *et al.*	1996
5	Fishbourne-Harbour, W.Sx.	Osborne	1971a
11	Hen Domen, Mont.	Greig *et al.*	1982
12	Hereford	Girling	1985
13	HS-Beverley-Highgate	Hall & Kenward	1980
13	HS-Beverley-Priory	Allison *et al.*	1996
14	HS-Cowick	Girling and Robinson	1989
15	HS-Dalton Parlours, W. Yorks.	Sudell	1990
16	HS-Dragonby, N. Lincs.	Buckland	1996
17	HS-Hull-Chapel Lane	Kenward	1979c
17	HS-Hull-Mytongate	Miller *et al.*	1993
17	HS-Hull-Sewer Lane	Kenward	1977
18	HS-Womerley, N.Yorks	Wagner and Pelling	1995
19	Kirkham, Lancs.	Carrott *et al.*	1995a
20	Leicester	Girling	1981b
21	Lincoln	Carrott *et al.*	1995c
22	London-Copthall Ave	Moulins, D. de	1990
22	London-Southwark	Tyers	1988
23	Norwich-Fishergate	Allison & Kenward	1994
24	Papcastle, Cumb.	Kenward & Allison	1988
25	Rudston, Yorks.	Buckland	1980
26	Sandtoft	Samuels & Buckland	1978
27	SB-Alcester, Warks.	Osborne	1971b
28	SB-Baginton, Warks	Osborne	1975
29	SB-Droitwich, Worcs.	Osborne	1977
30	SB-Stourport, Worcs	Osborne	1996
31	SB-Worcester	Osborne	1981a
31	SB-Worcester-Sidbury	Osborne	1983
32	Silchester, Hants	Amsden & Boon	1975
33	South Shields, Co.Durham	Osborne	1994b
34	Southampton-Glanville St	Buckland *et al.*	1976
35	Stone, Staffs	Moffet & Smith	1996
36	Taunton, Devon	Osborne	1984
37	Towcester, Northants.	Girling	1983
38	TV-Alchester, Oxon.	Robinson	1975

No.	Place	Author	Date
38	TV-Alchester, Oxon.	Giorgi & Robinson	1985
39	TV-Appleford, Oxon.	Robinson	1981a
40	TV-Barton Court, Oxon.	Robinson *et al.*	1984
41	TV-Farmoor, Oxon.	Robinson	1979
42	TV-Oxford-Dominican Priory	Robinson	1986
42	TV-Oxford-Hamel	Robinson	1981c
43	Whitton, S. Glam.	Osborne	1981b
44	Winchester, Hants.	Carrott *et al.*	1996
44	Winchester, L. Brook St.	Osborne	Unpub.
44	Winchester-The Brooks.	Carrott *et al.*	1996
45	York-5/7 Coppergate	Hall *et al.*	1983b
45	York-Bedern	Kenward *et al.*	1986
45	York-Bedern, area II	Hall *et al.*	1993a
45	York-Bedern, area IV	Hall *et al.*	1993b
45	York-Bedern, area X	Hall *et al.*	1993c
45	York-Church St.	Buckland	1976a
45	York-Coney St.	Kenward & Williams	1979
45	York-Coppergate	Kenward & Hall	1995
45	York-Lloyd's Bank	Buckland	1974
45	York-Lloyds Bank	Hall *et al.*	1983b
45	York-Rougier St.	Hall & Kenward	1990
45	York-Skeldergate	Hall *et al.*	1988
45	York-Tanner Row	Hall & Kenward	1990

Fig. 5.2: Estimated number of Coleoptera recovered from Roman contexts in England and Wales.
For location see Fig. 5.1. For other details see Table 5.1. Sites with very small assemblages omitted.
Rural sites coloured green, urban sites coloured red.

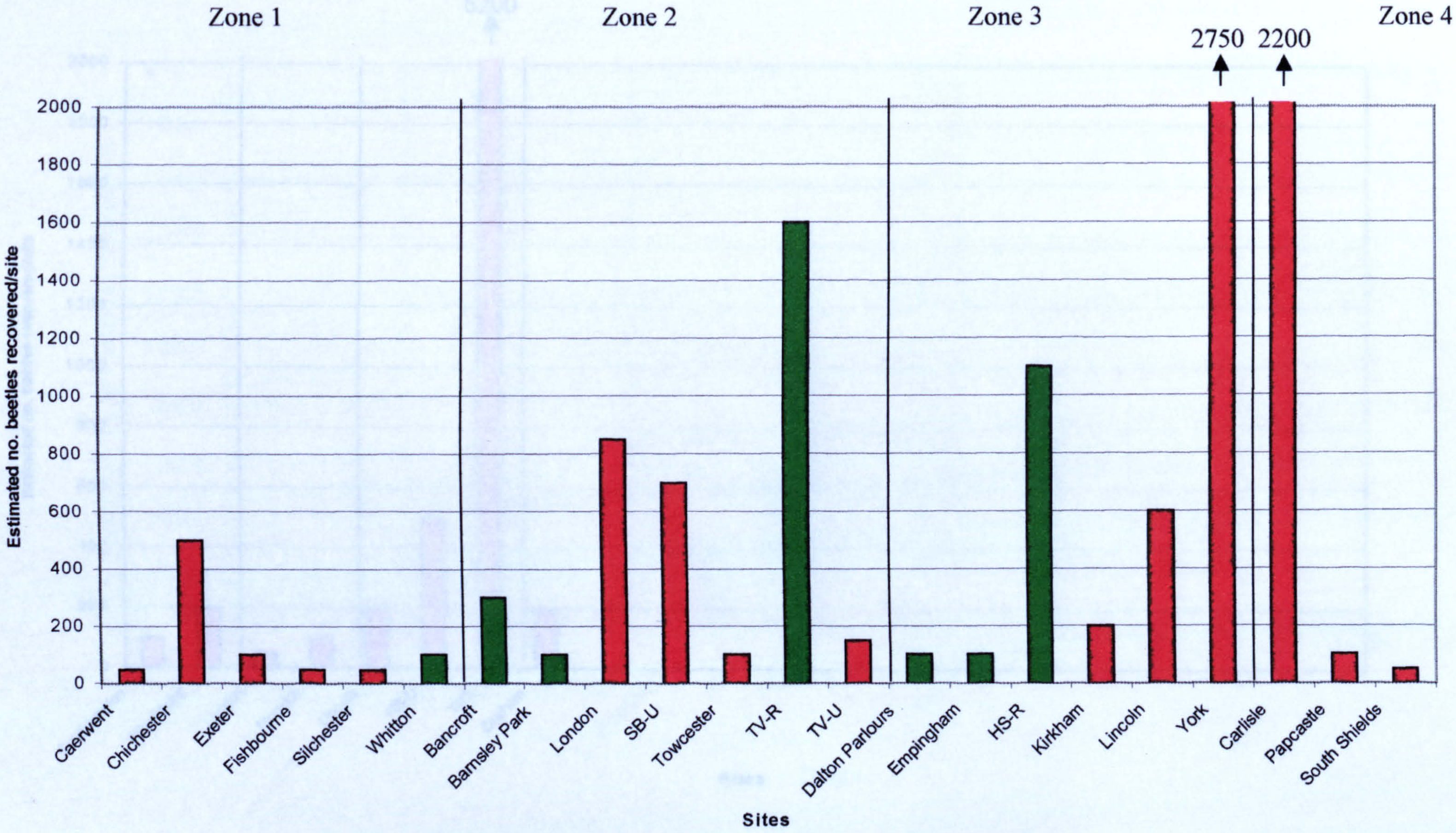


Fig. 5.3: Estimated number of Coleoptera recovered from early medieval contexts in England and Wales.
For location see Fig. 5.1. For other details see Table 5.1. Sites with very small assemblages omitted.
Rural sites coloured green, urban sites coloured red.

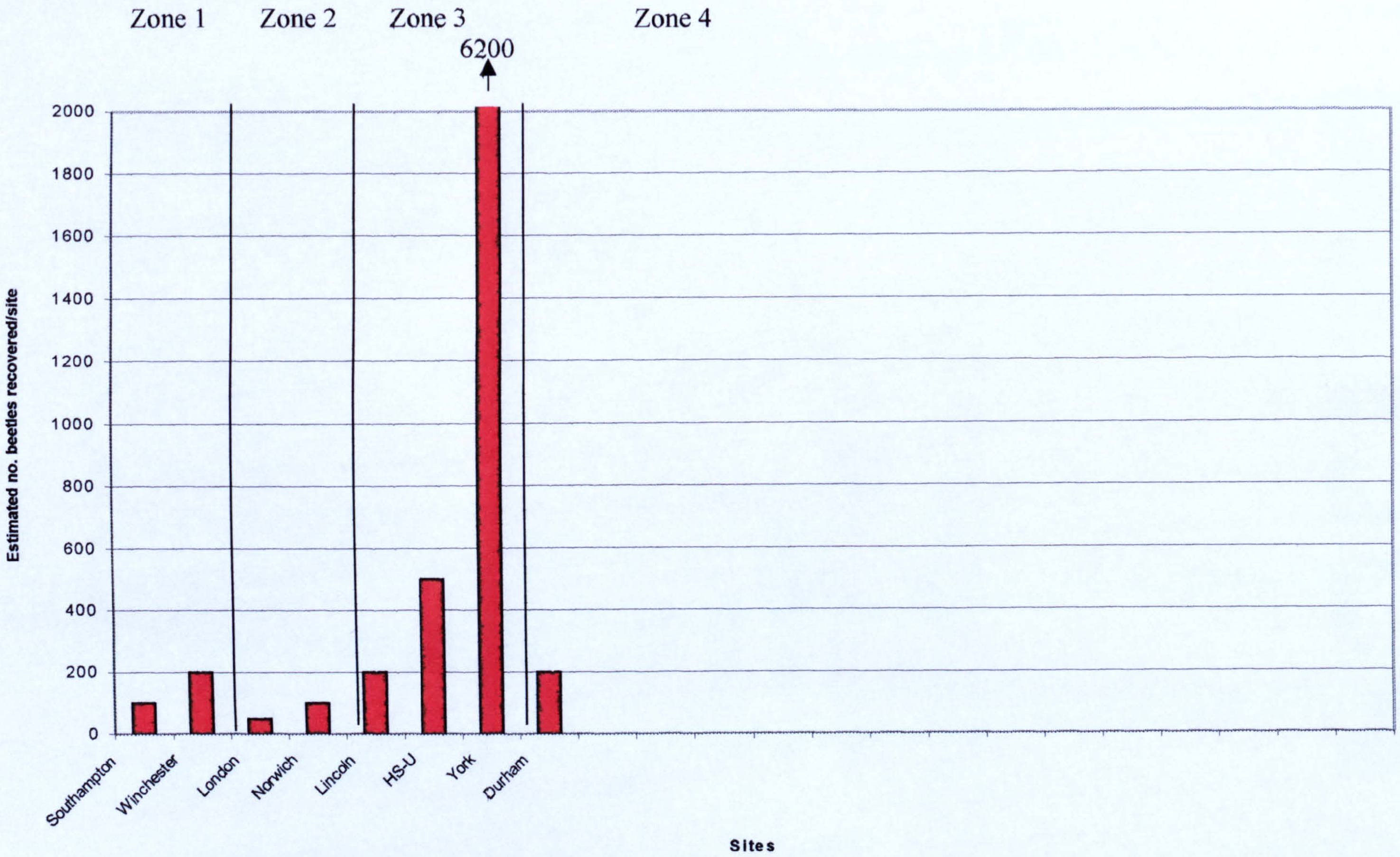


Fig. 5.4: Estimated number of Coleoptera recovered from late medieval contexts in England and Wales.
For location see Fig. 5.1. For other details see Table 5.1. Sites with very small assemblages omitted.
Rural sites coloured green, urban sites coloured red.

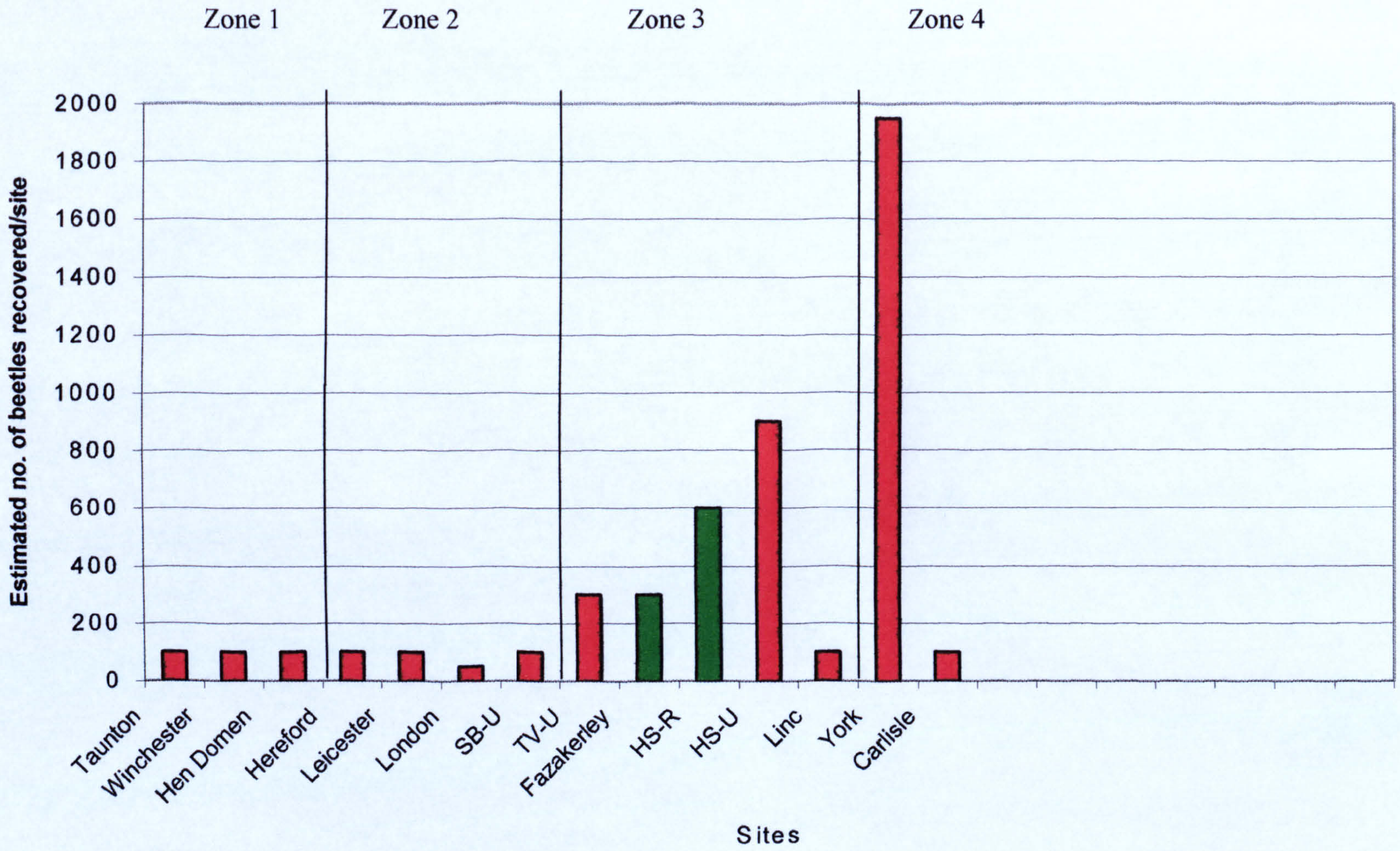


Fig. 5.5: Estimated number of coleoptera recovered from post medieval contexts in England and Wales.
For location see Fig. 5.1. For other details see Table 5.1. Sites with very small assemblages omitted.
Rural sites coloured green, urban sites coloured red.

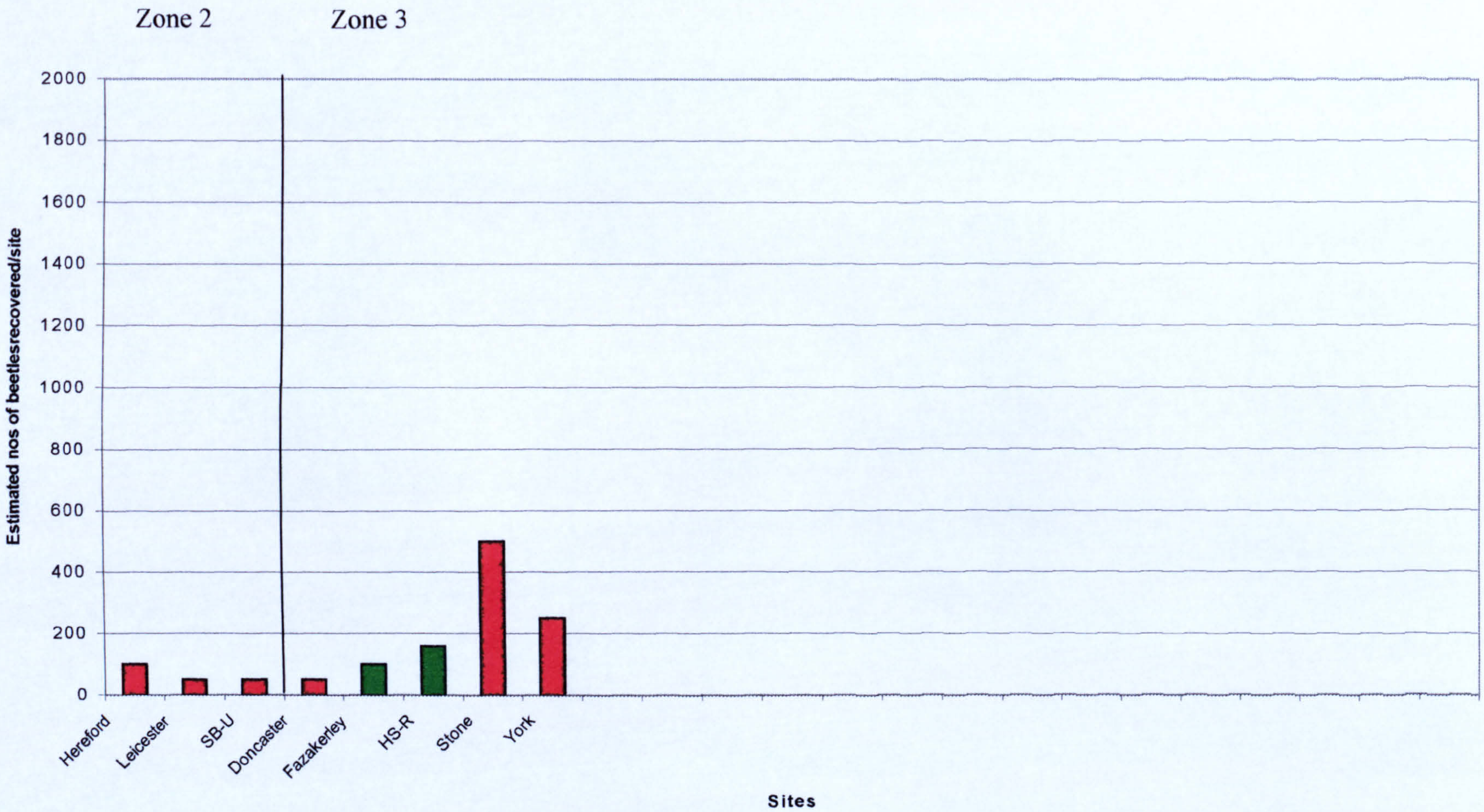


Fig. 5.6: Column chart showing the types of features investigated for insect remains, in England and Wales by period.
For explanation of abbreviations see key to Table 5.1.

Nos. of contexts represented: - 102 Roman; 597 early medieval; 68 late medieval and 12 post-medieval

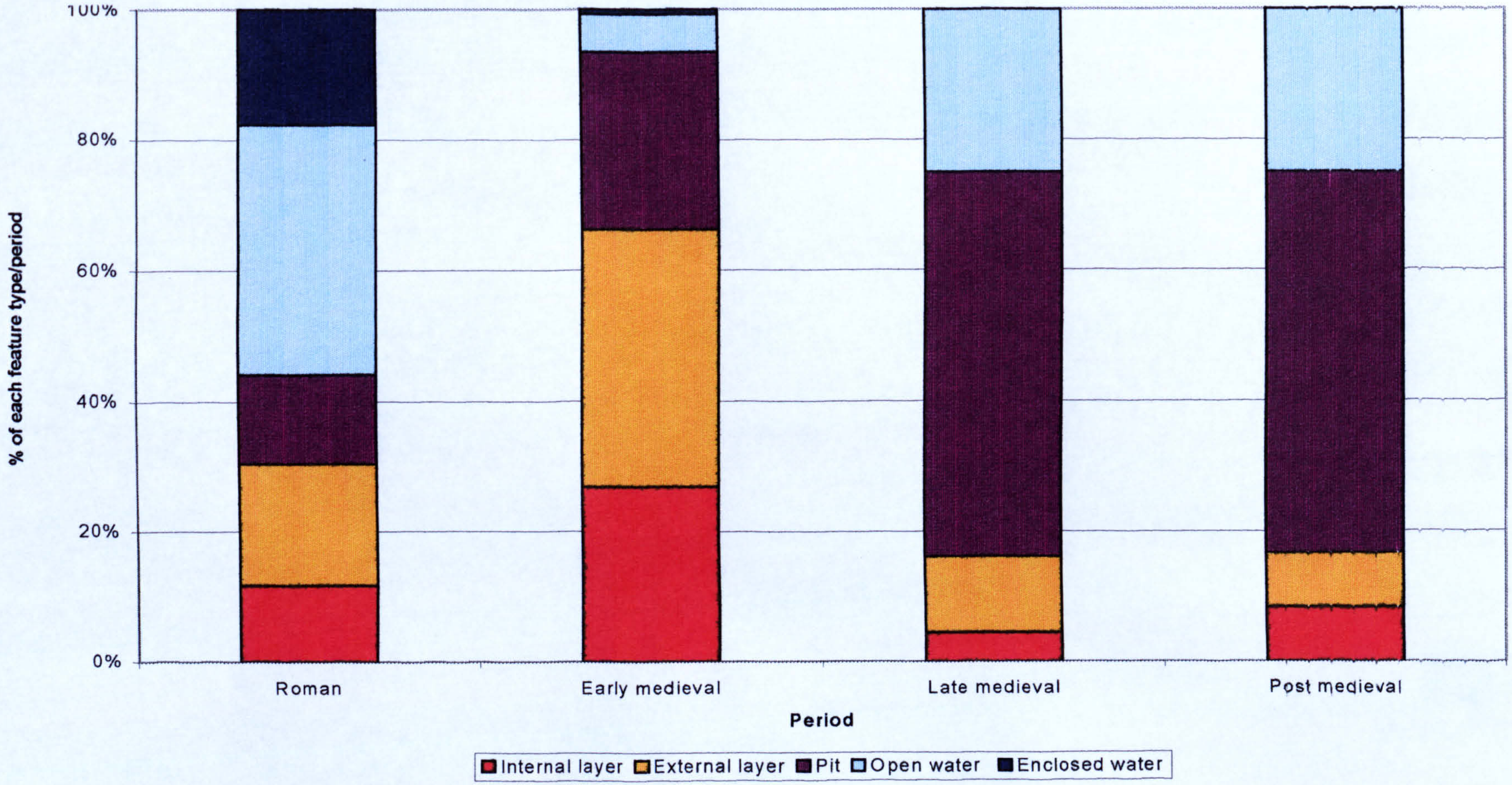


Table 5.1: Details of the database of sites in England and Wales.

Place	Age	Author	Date	F	List	S	Comments	Z	L
Aston Mill, Worc.	02	Whitehead	1989	P	NQ	VS	No other archaeology remaining, sandy grazing land.	2	R
Aylesbury	10-16	Carrott *et al.*	1995b	U	No	VS	Village site, no details of faunal list.	2	R
Bancroft, Bucks.	01	Pearson & Robinson	1994	D	FQ, IL	M	Villa on long-settled site. Lower fills of artificial pond.	2	R
Bancroft, Bucks.	03	Pearson & Robinson	1994	P	FQ, IL	M	Villa on long-settled site. Waterhole?	2	R
Bancroft, Bucks.	04	Pearson & Robinson	1994	D	FQ, IL	M	Important villa on long-settled site. Upper fills, artificial pond.	2	R
Barnsley Park, Glos.	04	Coope & Osborne	1968	W	NQ	M	Roman villa site,	2	R
Bunny, Notts	04	Alvey	1976	W	NQ, IR	VS	No buildings found except ?corn drier.	2	R
Caerwent, Mon.	05	Amsden & Boon	1975	U	NQ, IR	S	Several unspecified features examined.	1	U
Carlisle-LELA, Cum & West	01-02	Kenward *et al.*	1992a	M, 5	SQ, H	L	Evidence of stabling, imported turves.	4	U
Carlisle-LELA, Cum & West	02	Kenward *et al.*	1992a	P	SQ, H	M	Unknown origin.	4	U
Carlisle-OGLA, Cum & West	02-03	Kenward *et al.*	1992b	M, 2	SQ, H	M	Evidence for grazing animals?	4	U
Carlisle-OGLA, Cum & West	12-13	Kenward *et al.*	1992b	W	SQ, H	M	Rubbish filled well.	4	U
Carlisle-OGLA, Cum & West	01	Kenward *et al.*	1992b	P, 4	SQ, H	M	Mainly soil used for backfill?	4	U
Carlisle-OGLA, Cum & West	01	Kenward *et al.*	1992b	D, 4	SQ, H	L	?Pigs present.	4	U
Carlisle-OGLA, Cum & West	01	Kenward *et al.*	1992b	M, 7	SQ, H	L	?Pigs present.	4	U
Carlisle-OGLA, Cum & West	01	Kenward *et al.*	1992b	B, 4	SQ, H	M	Evidence of fairly clean dry buildings.	4	U
Carlisle-OGLB, Cum & West	01	Kenward *et al.*	1992c	M, 2	SQ, H	M	Evidence of stabling.	4	U
Carlisle-OGLB, Cum & West	02	Kenward *et al.*	1992c	W	SQ, H	M	Evidence of stable manure and turf, grain dump.	4	U
Carlisle-OGLB, Cum & West	01	Kenward *et al.*	1992c	B	SQ, H	M	Sample from wattle and cob wall.	4	U
Chichester-Market, W.Sx.	04	Girling	1989	W	FQ, IL	L	Well sump? On outskirts town.	1	U
Chichester-South St. W.Sx.	U	Grove this vol.		B	FQ	M	Beetles preserved under existing floor..	1	U
Cirencester, Glos.	01	Osborne	1982	M	FQ	VS	No indication of provenance.	2	U
Doncaster, S.Yorks	16-17	Smith	1989	B	FQ	S	Stable manure?	3	U
Drum Castle, Aber.	13-16	Kenward *et al.*	1995	B, 3	MQ, H	M	Samples from inside stone castle.	5	F
Dublin	11	Coope	1981	B	FQ	L	Indoor sample? From Viking house.	3	U
Dublin	11	Coope	1981	P	FQ	M	Outdoor sample? From Viking house.	3	U
Durham	11	Kenward	1979a	M, 3	TTQ	M	Probably middens.	4	U
Durham	11	Kenward	1979a	D	TTQ	M	Probable storm drain.	4	U
Empingham, Rutland	03	Buckland	1986	W	FQ, IR	M	Roman villa site.	2	R

Place	Age	Author	Date	F	List	S	Comments	Z	L
Exeter, Devon	01-02	Straker *et al.*	1984	D, 2	FQ	M	Roman fortress ditch. Some evidence of dung.	1	F
Fazakerley, Merseyside	12-13	Hall *et al.*	1996	D	FQ, H	M	Sequence of samples from rural area,	3	R
Fazakerley, Merseyside.	13-14	Hall *et al.*	1996	D	FQ, H	M	Sample from rural "pond".	3	R
Fazakerley, Merseyside.	14-15	Hall *et al.*	1996	D	FQ, H	M	Sample from rural "pond"	3	R
Fazakerley, Merseyside.	15-17	Hall *et al.*	1996	D	FQ, H	M	Sample from rural "pond".	3	R
Fazakerley, Merseyside.	17-18	Hall *et al.*	1996	D	FQ, H	S	Top sample from rural "pond".	3	R
Fishbourne, W. Sx	11	Grove this vol.		W	FQ	M	Rural, ?waterhole, marshy area.	1	R
Fishbourne-Harbour, W.Sx.	01	Osborne	1971a	D	FQ	S	From harbour adjoining the early fort.	1	RF
Hen Domen, Mont.	12-13	Greig *et al.*	1982	P	FQ	M	Timber castle, possible stable waste.	2	F
Hereford	12-13	Girling	1985	M	FQ	M	Fill of late Saxon ditch.	2	U
Hereford	18	Kenward	1985b	P	RQ, H	M	Town site, kitchen waste?	2	U
HS-Beverley-Highgate	11	Hall & Kenward	1980	M	TTQ	L	Rubbish dump? Sequential samples.	3	U
HS-Beverley-Priory	12-14	Allison *et al.*	1996	D, 3	MQ, H	M	Overgrown wet area, some dye waste and cess.	3	U
HS-Beverley-Priory	12-14	Allison *et al.*	1996	P, 3	MQ, H	M	Overgrown wet urban area, some dye waste and cess.	3	U
HS-Cowick	14	Girling and Robinson	1989	D	FQ	L	Moated manor house, sequence of samples from two places.	3	R
HS-Dalton Parlours, W.	03	Sudell	1990	W	FQ	M	Villa site.	3	R
HS-Dragonby, N. Lincs.	01	Buckland	1996	W	FQ	L	Wicker-lined well, just post Roman Conquest.	3	R
HS-Hull-Chapel Lane	13-14	Kenward	1979c	D	TTQ	L	Strandline build up rubbish near town. Sequential samples.	3	U
HS-Hull-Mytongate	14	Miller *et al.*	1993	P	FQ	M	Household waste.	3	U
HS-Hull-Mytongate	15	Miller *et al.*	1993	P	FQ	M	Household waste.	3	U
HS-Hull-Sewer Lane	14	Kenward	1977	P	No	VS	Garden waste?	3	U
HS-Womerley, N.Yorks	13-15	Wagner and Pelling	1995	D	FQ	M	Samples from early fill of moat, by timber bridge.	3	R
HS-Womerley, N.Yorks	17	Wagner and Pelling	1995	D	FQ	S	Fill following demolition of gatehouse, silted up moat.	3	R
HS-Womerley, N.Yorks	18	Wagner and Pelling	1995	D	FQ	M	Fill following recut of moat.	3	R
Kirkham, Lancs.	01-02	Carrott *et al.*	1995a	D, 2	SQ, H	M	Earliest defenses. Horse manure in ditches.	3	F
Kirkham, Lancs.	03	Carrott *et al.*	1995a	D, 2	SQ, H	M	Stone fort, some horse manure in ditches.	3	F
Kirkwall, Orkney	15-16	Locke	1982	D	NQ, IL	S	Ditch near harbour.	5	U
Leicester	13	Girling	1981b	D	FQ	M	Moat of friary. Bottom sample of sequence.	2	U
Leicester	16 +	Girling	1981b	D	FQ	S	Upper fill from moat. Stone building, glazed windows.	2	U
Lincoln	03	Carrott *et al.*	1995c	M, 5	FQ	M	Dumps of waste, into water.	3	U
Lincoln	10	Carrott *et al.*	1995c	M, 2	FQ	M	Dumps of waste, into water.	3	U

Place	Age	Author	Date	F	List	S	Comments	Z	L
Lincoln	12-13	Carrott *et al.*	1995c	P	FQ	M	Pit within a building?	3	U
Lincoln	04	Carrott *et al.*	1995c	M, 6	FQ, H	L	Dumping into water.	3	U
Lincoln	10-11	Carrott *et al.*	1995c	P, 3	FQ, H	M	Urban pits.	3	U
London-Copthall Ave	01	Moulins, D. de	1990	D, 7	RQ, H	M	Early settlement beyond, fort	2	U
London-Copthall Ave	02-03	Moulins, D. de	1990	D	RQ, H	L	Town drain	2	U
London-Copthall Ave	04	Moulins, D. de	1990	D, 4	RQ, H	M	Natural assemblages from a drainage ditch.	2	U
London-Copthall Ave	11-12	Moulins, D. de	1990	M, 6	RQ, H	S	Earliest sample typical urban. Rest apparently natural.	2	U
London-Copthall Ave	02-03	Moulins, D. de	1990	B	RQ, H	S	Floor surface.	2	U
London-Copthall Ave	04	Moulins, D. de	1990	P, 2	RQ, H	M	Pit or possibly well.	2	U
London-Cutlers Gdns	18	Girling	1984	P	FQ	VS	Horn core lined pit.	2	U
London-Southwark	02	Girling	1979	P	FQ	VS	Urban site. Timber lined pit.	2	U
London-Southwark	02	Tyers	1988	P	FQ	VS	Few details, but pit contained grain.	2	U
London-Southwark	18	Tyers	1988	D	FQ	S	Rural ditch.	2	U
London-Southwark	13-14	Tyers	1988	P	FQ	S	Cess pit.	2	U
N. Ireland	08	Kenward & Allison	1994	B, 2	FQ, H	M	Isolated rath	3	R
Nantwich, Cheshire	12-13	Colledge	1981	D	NQ	VS	Field ditch, surrounding castle?	2	R
Northampton	10	Keepax *et al.*	1979	P	FQ	VS	Food remains?	2	U
Northampton	10-11	Robinson	1983b	P	FQ	VS	Contained flax threshing debris.	2	U
Norwich-Fishergate	10-11	Allison & Kenward	1994	U	NQ, H	M	Typically urban deposits.	2	U
Papcastle, Cumb.	01-02	Kenward & Allison	1988	U	NQ, H	M	Little information provided	4	F
Pluscarden, Moray	15-16	Buckland	1994	P	FQ	M	Enclosed pit, near church.	5	U
Rudston, Yorks.	04	Buckland	1980	W	FQ	L	On site of Roman villa, samples from well fill.	3	R
Sandtoft	04	Samuels & Buckland	1978	D	FQ	M	Beetles from river, some synanthropes.	3	F
SB-Alcester, Warks.	01	Osborne	1971b	P	FQ	L	Possibly leather processing waste or stable manure.	2	U
SB-Baginton, Warks	01	Osborne	1975	W	FQ	S	Pasture land.	2	R
SB-Droitwich, Worcs.	04	Osborne	1977	D	FQ	S	Grain pests in 20kg sample.	2	U
SB-Stourport, Worcs	02-03	Osborne	1996	D	FQ	M	Entirely natural deposit.	2	N
SB-Worcester	15	Osborne	1981a	P	FQ	M	Cesspit, no further details.	2	U
SB-Worcester-Sidbury	17	Osborne	1983	P	FQ	S	Cesspit, no further details.	2	U
Silchester, Hants	05	Amsden & Boon	1975	U	NQ, IR	S	Several unspecified features examined.	1	U
South Shields, Co.Durham	02	Osborne	1994b	P	FQ	S	No indication of provenance.	4	F

Place	Age	Author	Date	F	List	S	Comments	Z	L
Southampton-6 Dials	08-09	Girling & Kenward	1986	P, 2	FQ, IR	VS	Garderobe, no further details.	1	U
Southampton-Glanville St	08	Buckland *et al.*	1976	P	FQ	M	Unusual burial of ?dung.	1	U
Southampton-L. High St.	15	Grove this vol.		P	FQ	L	Garderobe pit from high status town house, exotic grain pests.	1	U
Southampton-L. High St.	09-10	Grove this vol.		P	FQ	M	Pit from edge of settlement.	1	U
Southampton-U.Bugle St.	13	Girling & Kenward	1986	P	FQ, IR	VS	Garderobe, no further details.	1	U
St Albans, Herts	01	Bradley	1958	D	NQ, IR	VS	Rubbish filled ditch	2	U
Stone, Staffs	15-16	Moffet & Smith	1996	M	FQ	L	Sequence of floor deposits	2	U
Taunton, Devon	12	Osborne	1984	P	FQ	S	Timber lined pit or pond	1	U
Taunton, Devon	12	Osborne	1984	D	FQ	S	Watercourse associated with pit or pond.	1	U
Towcester, Northants.	04	Girling	1983	D, 2	NQ	M	Evidence of wooden buildings with padstones and metal working.	2	U
TV-Alchester, Oxon.	01	Robinson	1975	D	FQ	S	Stagnant town ditch.	2	U
TV-Alchester, Oxon.	01-03	Giorgi & Robinson	1985	D	FQ	S	Purpose of ditches unknown.	2	U
TV-Alchester, Oxon.	04	Robinson	1975	D	FQ	S	Free flowing water in ditch, no evidence of settlement.	2	R
TV-Appleford, Oxon.	03	Robinson	1981a	W	FQ, IR	M	Long settled farm site. Well sump?	2	R
TV-Appleford, Oxon.	04	Robinson	1981a	W, 2	FQ, IR	L	Water holes?	2	R
TV-Barton Court, Oxon.	05-06	Robinson *et al.*	1984	W	FQ,	S	Saxon farm, evidence of grazing.	2	R
TV-Dorchester, Oxon.	05-06	Robinson	1981b	P	NQ	VS	Farm, evidence of grazing.	2	R
TV-Farmoor, Oxon.	03-04	Robinson	1979	W, 4	FQ	L	I/A settlement, Romano-British farm. Muddy waterholes.	2	R
TV-Farmoor, Oxon.	03-04	Robinson	1979	D, 2	FQ	L	I/A settlement, Romano-British farm.	2	R
TV-Oxford-Church St.	16	Brown & Robinson	1985	P	FQ	VS	Specimens, preserved by calcification.	2	U
TV-Oxford-Denny Abbey	12	Robinson	1980	P	FQ	VS	Garderobe pit.	2	U
TV-Oxford-Dominican Priory	15	Robinson	1986	D	FQ	M	Priory drains containing kitchen waste and sewage.	2	U
TV-Oxford-Hamel	13	Robinson	1981c	D, 3	FQ	M	Sequence of samples, showing urbanisation?	2	R
TV-Oxford-Hamel	13	Robinson	1981c	P, 2	FQ	M	Sequence of samples, showing urbanisation?	2	U
TV-Oxford-New Inn Court	10	Robinson	1984	P	FQ	VS	Cess deposits.	2	U
TV-Shakeoak, Oxon.	02	Robinson	1978	D, 2	FQ	VS	Two fishponds, on villa site.	2	R
Whitton, S. Glam.	04	Osborne	1981b	W	FQ	M	Farmstead, neglected garden? Similar samples from 2 levels.	1	R
Winchester, Hants.	01-02	Grove this vol.		D	FQ	M	Roman town ditch.	1	U
Winchester, Hants.	10-11	Carrott *et al.*	1996	P	FQ	M	Timber-lined pit	1	U
Winchester, L. Brook St.	10-11	Osborne	Unpub.	P, 5	FQ	M	Industrial? tanning? pits.	1	U
Winchester-The Brooks.	09-10	Grove this vol.		P, 2	FQ	M	Urban timber-lined pit	1	U

Place	Age	Author	Date	F	List	S	Comments	Z	L
Winchester-The Brooks.	11	Grove this vol.		P	FQ	M	Urban unlimed pit	1	U
Winchester-The Brooks.	14	Grove this vol.		P	FQ	M	Cesspit from wealthy man's house.	1	U
Winchester-The Brooks.	14	Grove this vol.		P	FQ	M	Disused stone tank.	1	U
Winchester-The Brooks.	14	Carrott *et al.*	1996	P	FQ	L	3 contexts from same pit as (Grove 67)	1	U
Winchester-The Brooks.	14	Carrott *et al.*	1996	P	FQ	M	2 more contexts from same pit as Grove (68)	1	U
York-5/7 Coppergate	09	Hall *et al.*	1983b	M, 83	TTQ	L	Near river. Location of buildings not known.	3	U
York-Bedern	02-03	Kenward *et al.*	1986	P	FQ, H	L	Disused well, filled with stable waste?.	3	F
York-Bedern	08	Kenward *et al.*	1986	P, 2	FQ, H	M	Purpose of pit unknown. Marshy area.	3	R
York-Bedern, area II	13	Hall *et al.*	1993a	P	SQ, H	M	Urban pit.	3	U
York-Bedern, area II	14	Hall *et al.*	1993a	P	SQ, H	M	Typical urban pit, food remains, 3 levels sampled.	3	U
York-Bedern, area II	14-15	Hall *et al.*	1993a	P, 3	SQ, H	L	Urban pits.	3	U
York-Bedern, area II	15-17	Hall *et al.*	1993a	P	SQ, H	S	Typical urban pit, studied for variation.	3	U
York-Bedern, area IV	13	Hall *et al.*	1993b	P	SQ, H	S	Typical urban pit.	3	U
York-Bedern, area IV	15-17	Hall *et al.*	1993b	P	SQ, H	S	Typical urban pit.	3	U
York-Bedern, area X	14	Hall *et al.*	1993c	P, 5	SQ, H	L	Typical urban deposits.	3	U
York-Bedern, area X	15-17	Hall *et al.*	1993c	P, 2	SQ, H	M	Typical urban deposits.	3	U
York-Bedern, area X	17	Hall *et al.*	1993c	P	SQ, H	S	Urban pit.	3	U
York-Bedern, area X	14-15	Hall *et al.*	1993c	P, 7	SQ, H	L	Evidence of cess but few parasitic eggs.	3	U
York-Church St.	04	Buckland	1976b	D	FQ	M	Roman sewer.	3	F
York-Church St.	02	Buckland	1976b	D	FQ	M	Roman sewer.	3	F
York-Coney St.	01-02	Kenward & Williams	1979	B	FQ	L	Granary.	3	U
York-Coney St.	01	Kenward & Williams	1979	D	FQ	S	Ditch, presumed Roman predates building.	3	U
York-Coppergate	10	Kenward & Hall	1995	D, 1	MQ	L	Tenements on site, cess, domestic and dye waste in pits.	3	U
York-Coppergate	10-11	Kenward & Hall	1995	D, 33	MQ	L	Ditch around buildings.	3	U
York-Coppergate	10-11	Kenward & Hall	1995	M, 65	MQ	L	Urban area, no further details.	3	U
York-Coppergate	10-11	Kenward & Hall	1995	B, 22	MQ	L	Partly sunken plank buildings.	3	U
York-Coppergate	09-10	Kenward & Hall	1995	P, 50	MQ	L	Tenements nearby, domestic waste in pits.	3	U
York-Coppergate	10	Kenward & Hall	1995	P, 37	MQ	L	Tenements nearby, domestic and dye waste in pits.	3	U
York-Coppergate	10	Kenward & Hall	1995	B, 52	MQ	L	Wattle buildings.	3	U
York-Coppergate	10-11	Kenward & Hall	1995	P, 60	MQ	L	New tenements built. Pit fills cess.	3	U
York-Coppergate	09-10	Kenward & Hall	1995	M, 24	MQ	L	Occupation nearby.	3	U

Place	Age	Author	Date	F	List	S	Comments	Z	L
York-Coppergate	10	Kenward & Hall	1995	M, 57	MQ	L	Tenements on site, domestic and dye waste in pits.	3	U
York-Lloyds Bank	09	Hall *et al.*	1983b	B, 83	TTQ	L	?Floor deposits, location of buildings not known.	3	U
York-Lloyd's Bank	09	Buckland	1974	P	FQ	M	Much leather waste.	3	U
York-Rougier St.	02 .1	Hall & Kenward	1990	D	SQ, H	M	Rubbish filled ditch.	3	U
York-Skeldergate	02-03	Hall *et al.*	1988	P	TTQ	L	Stable manure fill? mixed with sump?	3	U
York-Tanner Row	02 .1	Hall & Kenward	1990	D	SQ, H	M	First use of site, no buildings.	3	U
York-Tanner Row	02 .2	Hall & Kenward	1990	B, 2	SQ, H	M	1st structural phase, timber buildings.	3	U
York-Tanner Row	02 .2	Hall & Kenward	1990	D	SQ, H	M	1st structural phase, timber buildings.	3	U
York-Tanner Row	02 .2	Hall & Kenward	1990	P, 2	SQ, H	M	1st structural phase, timber buildings.	3	U
York-Tanner Row	13	Hall & Kenward	1990	P, 3	SQ, H	M	Many squalid timber buildings.	3	U
York-Tanner Row	02 .3	Hall & Kenward	1990	B, 2	SQ, H	M	Second range of timber buildings	3	U
York-Tanner Row	02 .3	Hall & Kenward	1990	M	SQ, H	M	Second range of timber buildings.	3	U
York-Tanner Row	02-03	Hall & Kenward	1990	B	SQ, H	M	Short-lived structures. Decline in foul rubbish.	3	U
York-Tanner Row	03	Hall & Kenward	1990	P	SQ, H	M	First stone buildings, timber-lined pit with ?kitchen waste.	3	U
York-Tanner Row	05	Hall & Kenward	1990	P, 2	SQ, H	M	Buildings survive into post Roman period.	3	U
York-Tanner Row	11-12	Hall & Kenward	1990	P	SQ, H	M	Many squalid timber buildings, timber-lined pit.	3	U

Table 5.1: Details of the database of sites in England and Wales.
Key to abbreviations.

F = Feature type
P = Pit
W= Enclosed water (well)
D = Open water (ditch)
M = Outdoor layer (midden)
B = Indoor deposit (in building)

List of Coleoptera
FQ = Fully quantified list
H = Hemiptera also recorded
IL = Incomplete list published
IR = Fewer taxa recovered due to 500μ sieve used
MQ = Only more abundant species quantified
NQ = List not quantified
No = List not seen
RQ = All nos estimated
SQ = Top ranking taxa nos estimated
TTQ = Only top ten ranking taxa quantified

S = Size of assemblage
VS (Very small) ≤ 10
S (Small) >10 ≤ 100
M (Medium) >100 ≤ 500
L (Large) >500
In Figs 5.2; 5.3; 5.4; 5.5 estimated numbers used are
S = 50, M =100, L = 500

Z = Zone
This indicates latitude, see Fig. 5.1 for locations
Zone 5 = Scotland
L = Locality
F = Fort
R = Rural
U = Urban (In Figs 5.2; 5.3; 5.4; 5.5, forts are included in urban

Fig. 6.1: Ecological classificatory system, based on habitat

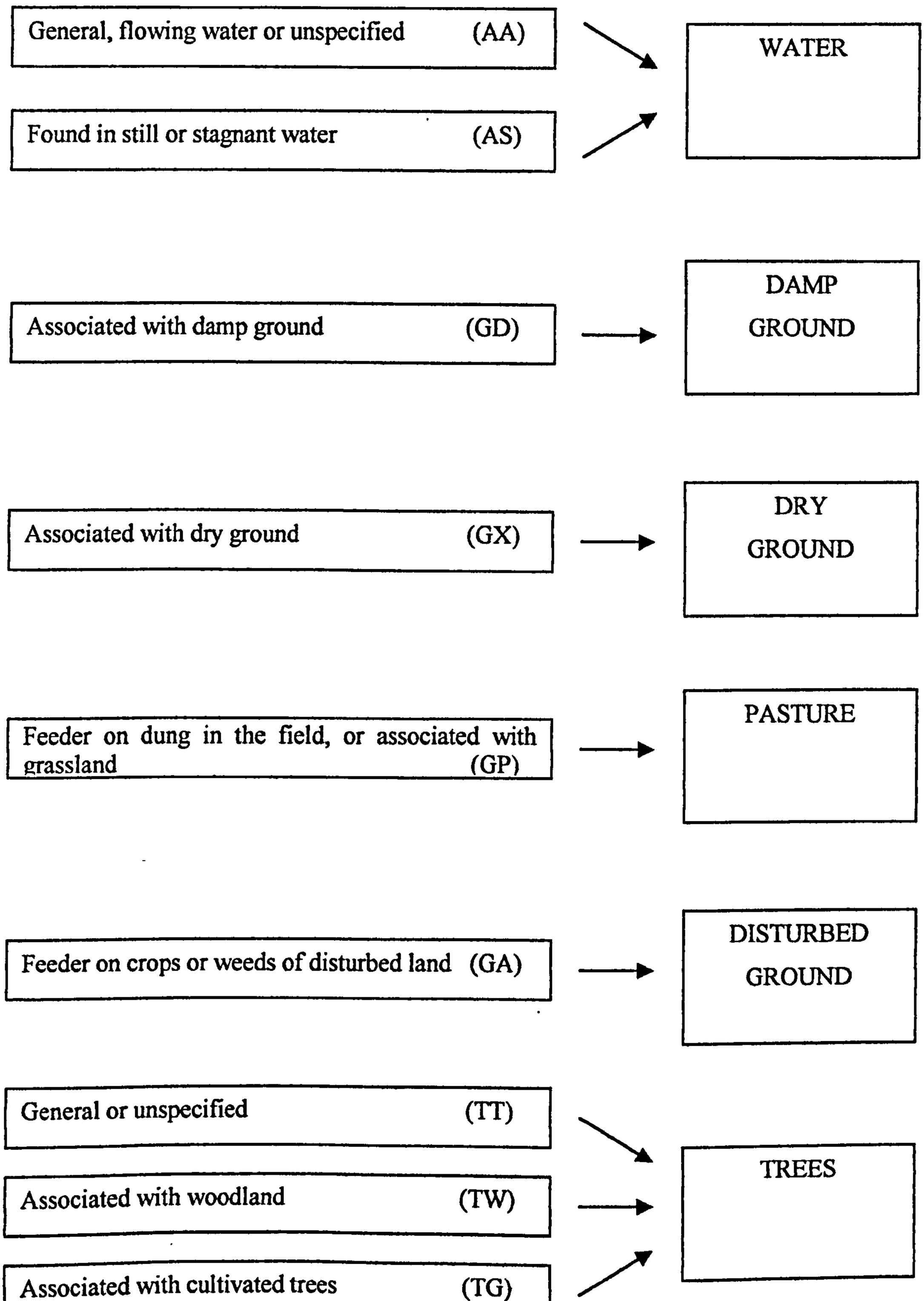
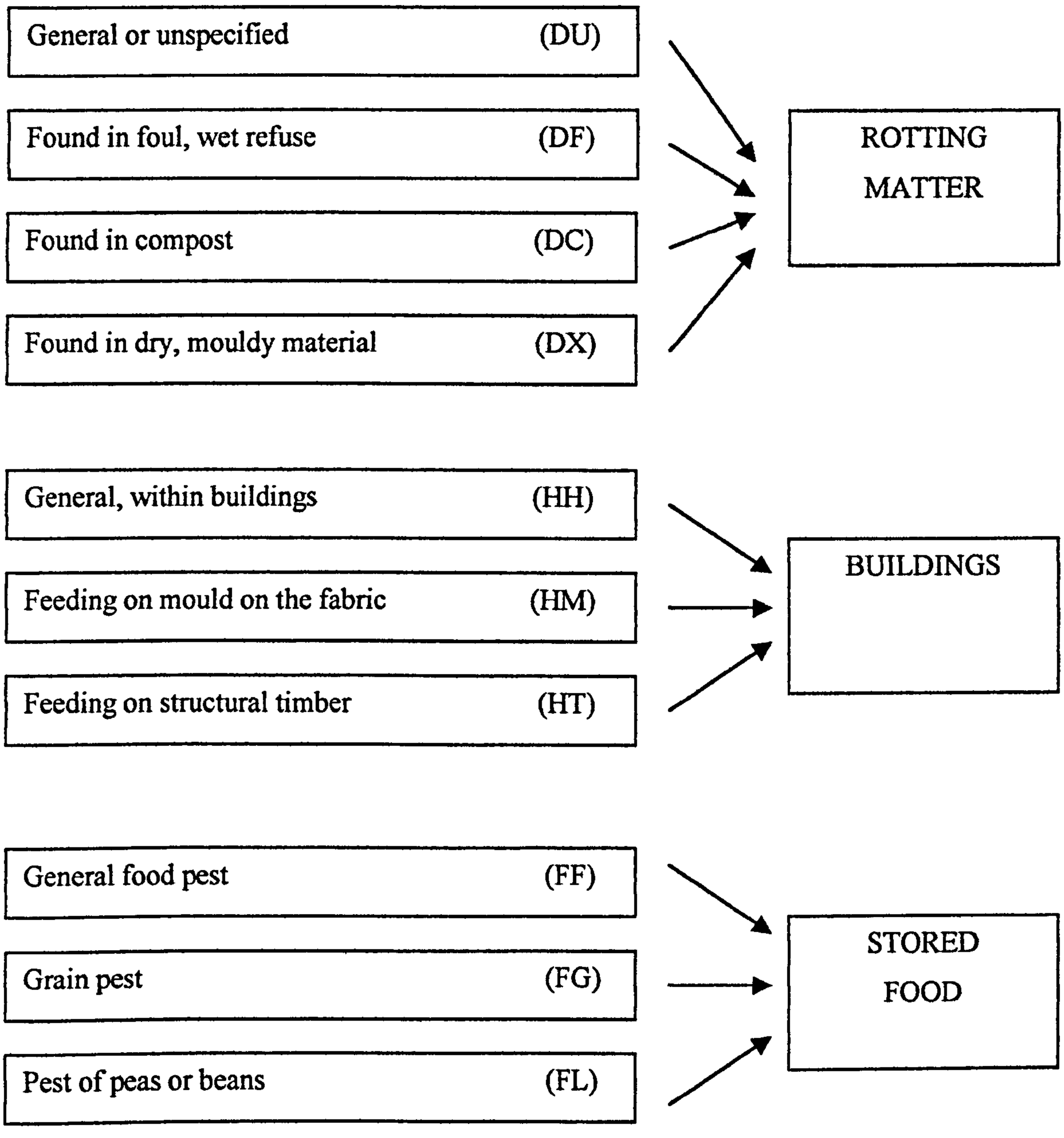


Fig. 6.1 continued

Sub-habitats represented and eco-code **Designated habitats**



Key to Fig. 6.1
Key to abbreviations used on habitat column charts

Code	Key	Colour code
WATER	Free standing water (Stagnant or flowing)	Dark blue
DAMP	Damp ground	Mid blue
DRY	Dry ground	Pale blue
PASTURE	Pasture	Dark green
DISTURBED	Disturbed ground, (Arable, garden or wasteland)	Mid green
TREE	Trees (woodland, scrub or individual trees)	Light green
ROTTING	Decomposing material (Unspecified)	Black
FOUL, WET	Foul, wet decomposing material	Dark brown
COMPOST	Decomposing plant waste	Mid brown
MOULDY	Damp mouldy plant matter	Yellow
HOUSE	Buildings	Red
FOOD	Stored food	Pink
UNCLASS	Unclassified	Grey

Ecological classificatory system based on habit
For explanation see Chapter 6.

Key to abbreviations used on second column of eco-codes

Eco-code	Explanation	Colour code
B	Burrower	Pale brown
C	Carabid, ground beetle	Pink
M	Mould feeder	Pale blue
N	Carrion feeder	Purple
V	Plant feeder	Pale green
U	Unclassified	Grey

Fig. 7.1: Street map of Winchester showing the location of The Brooks site, described in Chapter 7.

Reproduced with permission from Ordnance Survey.

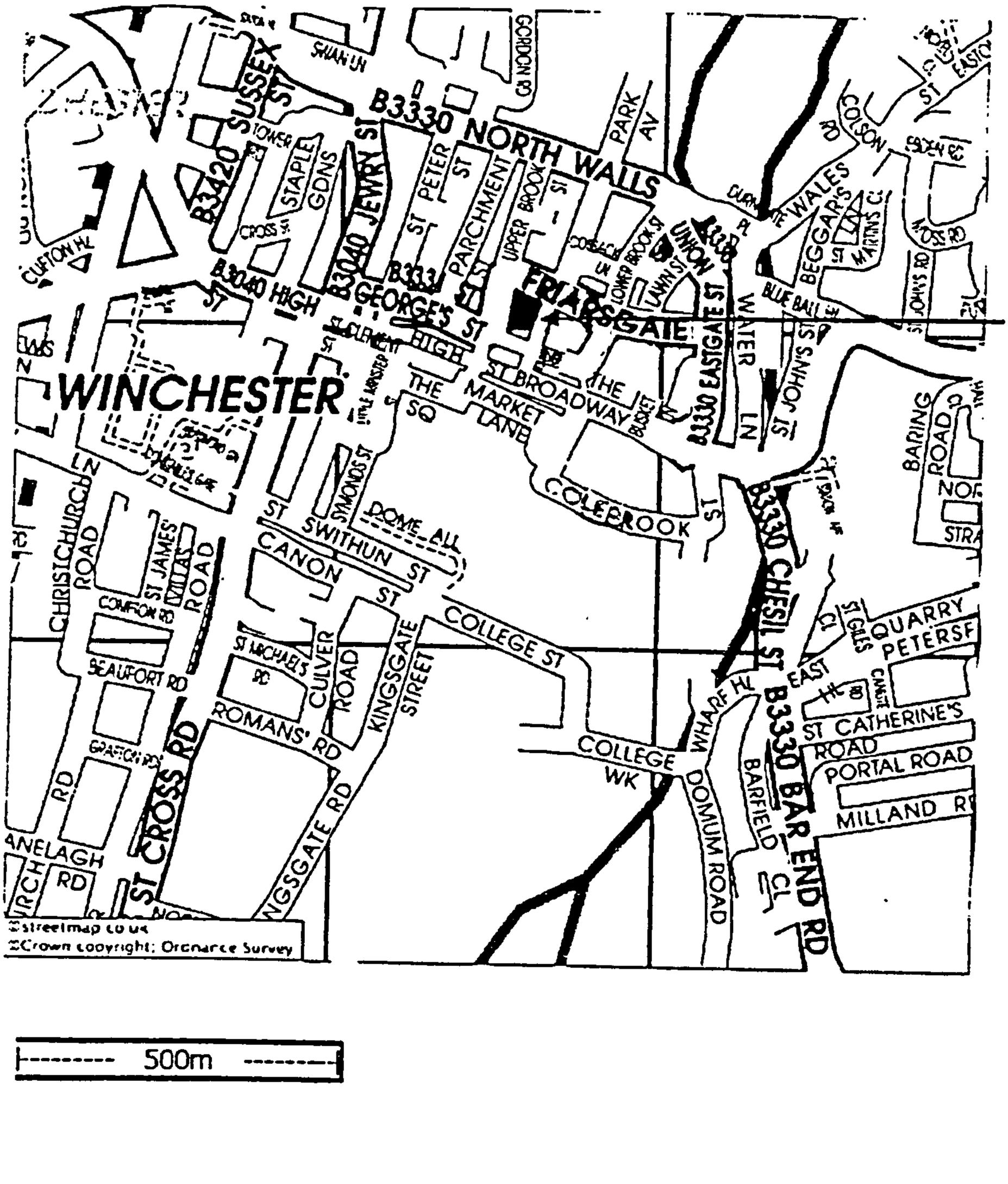


Fig. 7.2: Winchester. Site plan, showing position of Roman and Saxon features sampled for insect remains. Roman numerals denote Insula numbers.

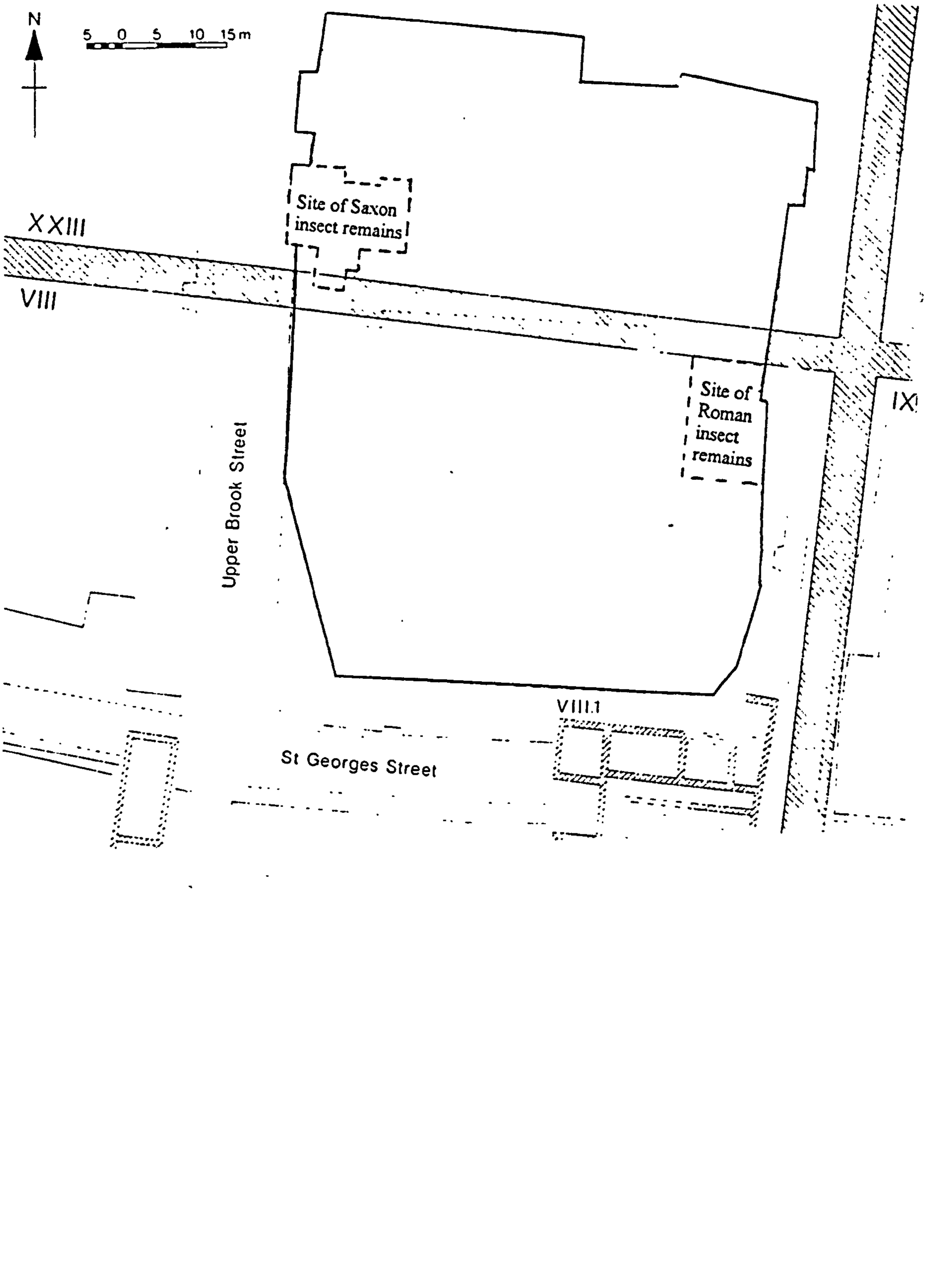


Fig. 7.3: Winchester. Plan of Roman ditch (1706), sampled for insect remains. For location see Fig. 7.2.

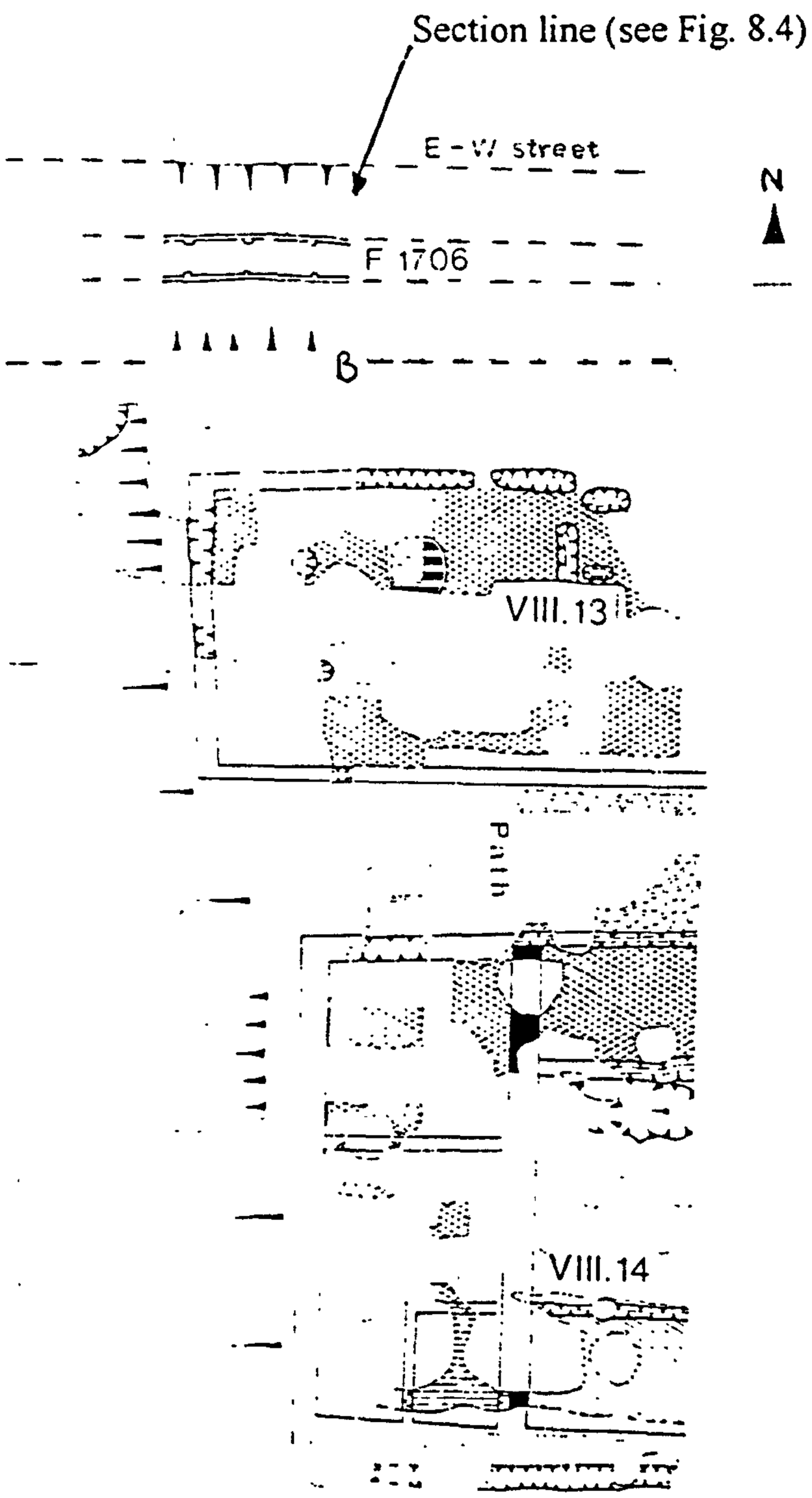


Fig. 7.4: Winchester. Section through Roman ditches, sampled for insect remains. For location, see Fig. 7.3.

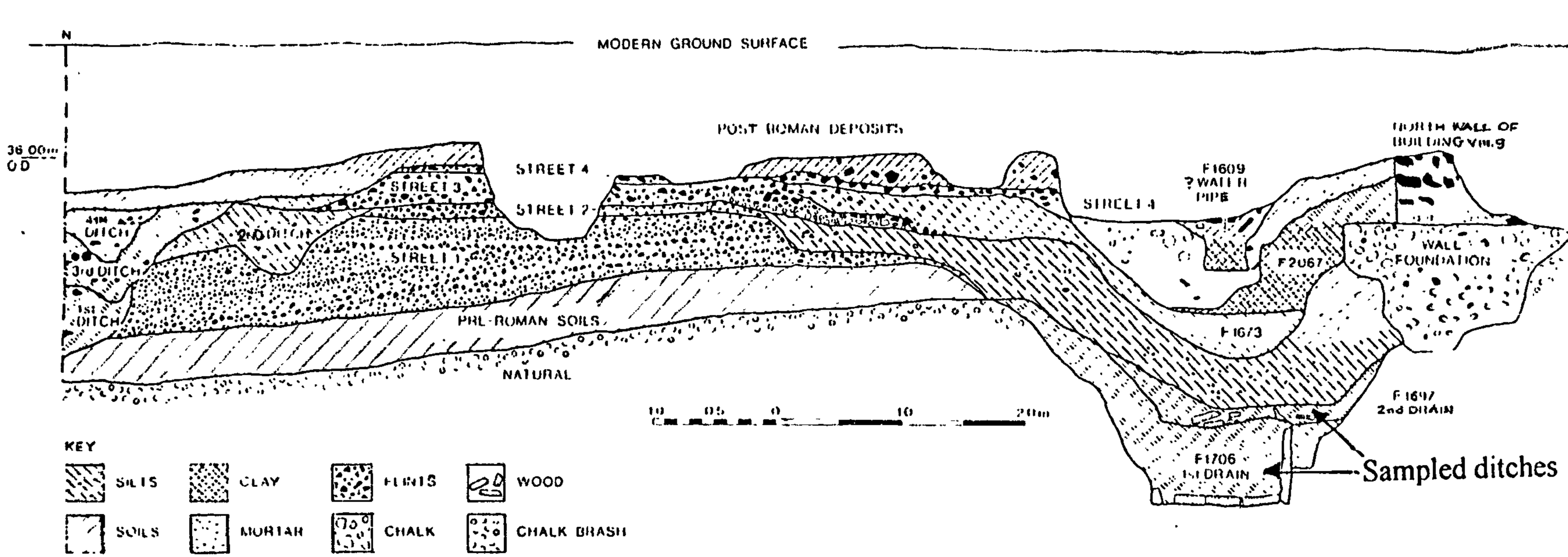
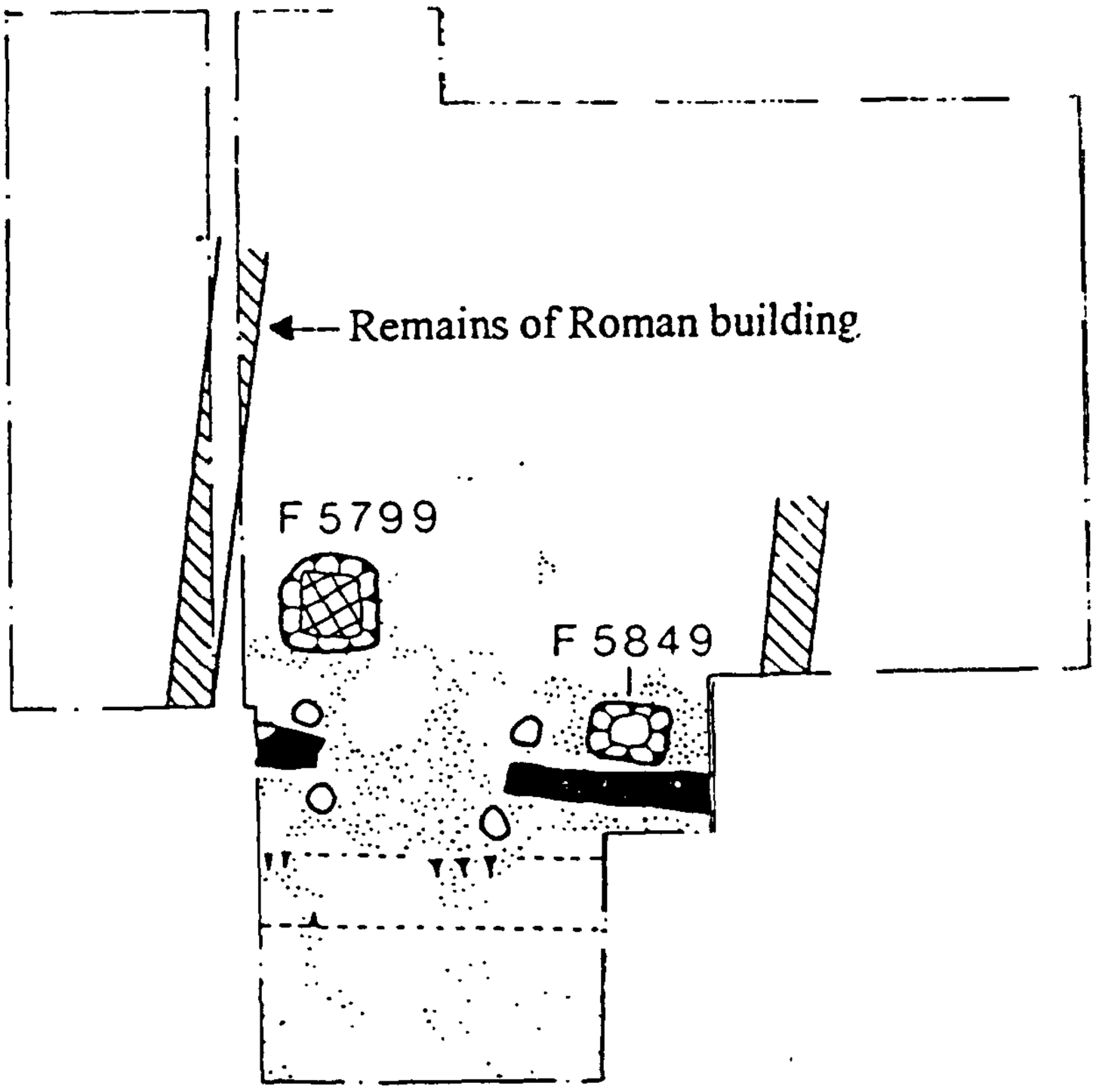


Fig. 7.5: Winchester. Plan showing the Saxon features sampled for insect remains. For location, see Fig. 7.3.

Earlier Saxon features, sampled pit (F5799) shown crosshatched



Later Saxon features, sampled pits (F5726; F5961) shown crosshatched

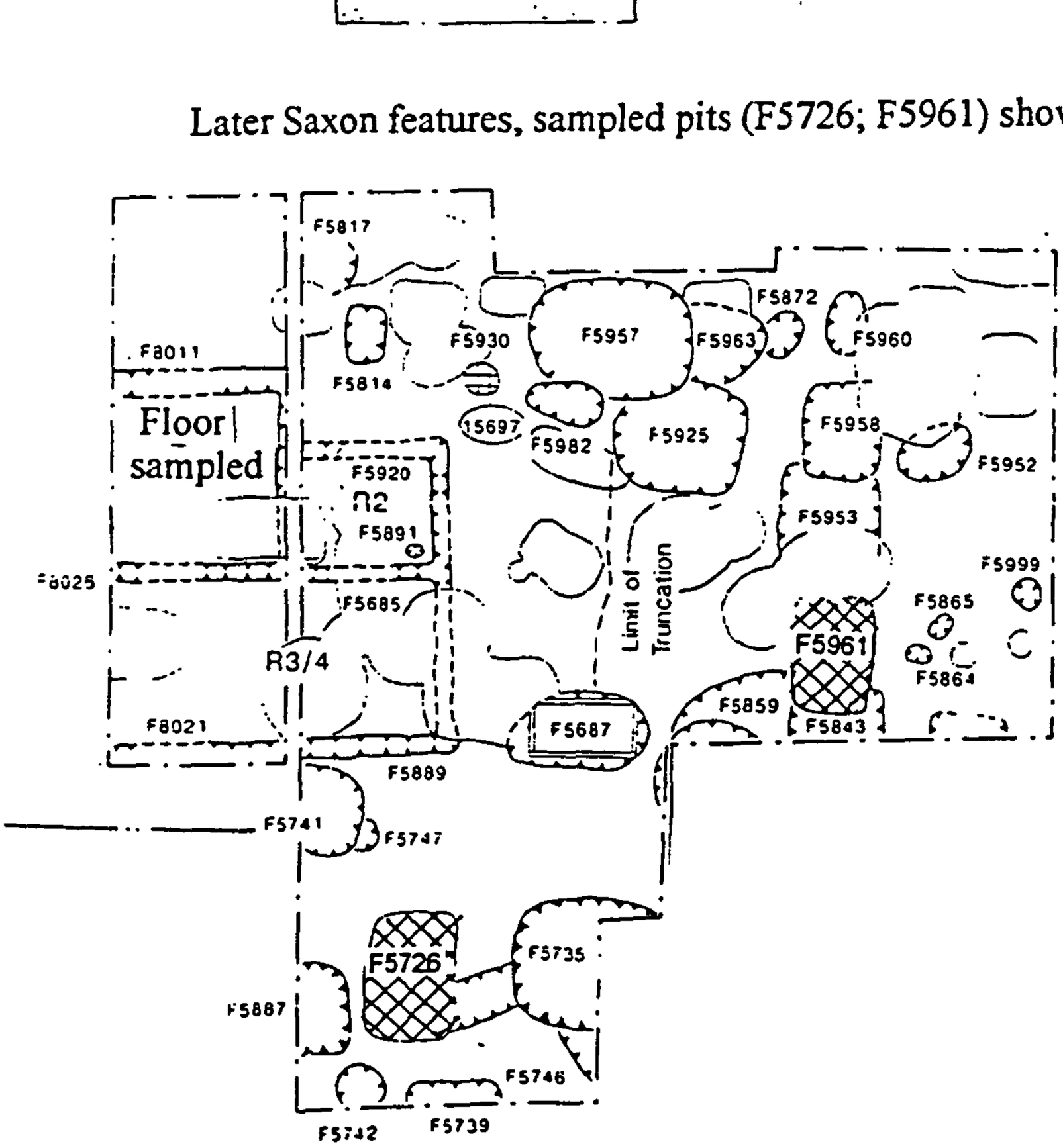
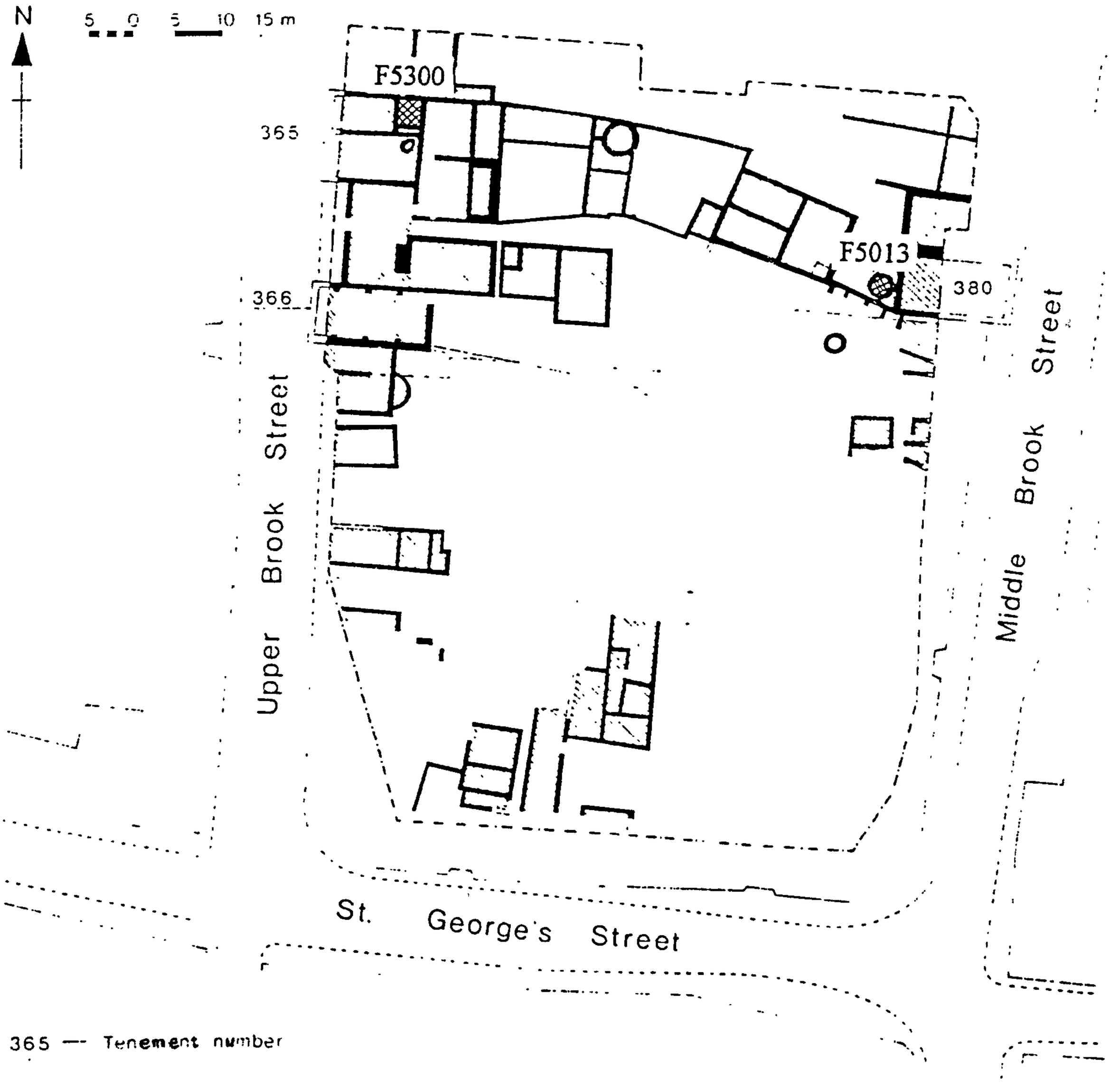


Fig. 7.6: Winchester. Plan showing the location of the late medieval features. Pits sampled for insect remains (F5300; F5013), shown crosshatched.



365 — Tenement number

Table 7.1: Winchester, sample details

Sample no.	Size in kg	Feature	Feature number	Context Number	Period in centuries AD	Comments
900	3	Timber-lined ditch	F1706	14231	Late 1st	Bottom fill
899	1.5	Timber-lined ditch	F1706	14230	Late 1st	Lower mid fill
898	3.5	Timber-lined ditch	F1706	14229	Late 1st	Upper mid fill
897	5.5	Timber-lined ditch	F1706	14228	Late 1st	Top fill
885	4.75	Recut ditch	F1695	13371	Early-mid 2nd	Top fill
281	1.00	Unlined sub-rectangular pit	F5961	16667	Mid 9th-mid 10th	Fill unspecified
275	2.00	Timber-lined pit	F5799	16565	Early 10th	Fill unspecified Later body stumped over it
236	1.00	Well	F5726	15795	10th-11th	Lower backfill
228	1.25	Well	F5726	14963	Late 11th –12th?	Upper backfill
358	2.25	Floor layer		80116	10th–11th	
60	2.50	Internal latrine pit	F5300	10971	Late 14th	Top fill includes roof debris
49	5.20	Tank	F5013	11083	Late 14th	Sample taken 1m down

Table 7.2: Winchester, list of Coleoptera recovered from all features
See Section 6.3 and Fig. 6.1 for definition of "eco code" and abbreviations used
See Table 7.1 for sample details

Eco	Code	Sample number	900	899	898	897	885	358	281	275	236	228	60	49
		CARABIDAE												
TW	C	*Nebria spp.*				1	1							
GD	CB	*Clivina fossor* (L.)				1					1	1		
GD	CB	*Trechus micros* (Hbst.)					1		1	1	1			1
UU	C	*Trechus obtusus/4-striatus*				1	1					1	1	1
GX	C	*Bembidion lampros* (Hbst.)								1				
GD	C	*Pterostichus nigrita* (Payk.)									1			
UU	C	*Pterostichus melanarius* (Ill.)							1		1			1
UU	C	*Pterostichus spp.*				1				1			1	1
HH	C	*Laemostenus terricola* (Hbst.)									1			
		HYDRAENIDAE												
AR		*Limnebius truncatellus* (Thun.)				1								
AA		*Limnebius sp.*								1				
		HYDROPHILIDAE												
GA	V	*Helophorus porculus* Bed.											2	
AS		*Helophorus aquaticus/aequalis*				1								
AS		*Helophorus spp.*				1	1	1			1			1
DF		*Sphaeridium spp.*	1	1	1	1	1							
DF		*Cercyon hæmorrhoidalis* (F.)							2	1				
DC		*Cercyon analis* (Payk.)				1	1				2	24		2
DU		*Cercyon spp.*	1		2	3	3		2	2	2			2
DU		*Megasternum obscurum* (Marsh.)				1								
DF		*Cryptopleurum minutum* (F.)												1
AS		*Berosus affinis* Brul.	1			1								
		HISTERIDAE												
DF		*Acritus nigricornis* (Hoff.)	1						1			1		
DX		*Dendrophilus punctatus* (Hbst.)									1			
DX		*Hister merdarius* Hoff.									2			
DU		*Hister sp.*							1					
		LEIODIDAE												
DX		*Nargus sp.*												1
DU		*Catops nigrita* Er.											1	
DU		*Catops fuliginosus* Er.										2		
		SCYDMAENIDAE												
DC		*Eutheia sp.*									1			1
DC		*Scydmaenus tarsatus* Müll. & Kunze				1								
		PTILIIDAE												
DX	M	*Ptenidium spp.*	1							2	4	29		3
		STAPHYLINIDAE												
DC	M	*Micropeplus fulvus* Er.							1					
DF	M	*Micropeplus porcatus* (Payk.)											1	
DF		*Proteinus ovalis* Steph.	1										1	
DU		*Proteinus sp.*					1							
UU		*Phyllodrepa floralis* (Payk.)									5			
UU		*Phyllodrepa sp.*												1
		Dropephylla vilis (Er.)				1								
		Dropephylla sp.									1			1
DU		*Omalium rivulare* (Payk.)	2						2	4		1	1	2
DU		*Omalium allardi* Fairm.& Bris									20	2		3
DC		*Omalium caesum* Grav.			1	1	1							
DX		*Xylodromus depressus* (Grav.)										1		
DX		*Xylodromus concinnus* (Marsh.)				1		1	3	3	6	6	8	7
DF		*Coprophilus striatulus* (F.)							4	10		1	2	1
DF		*Carpelimus bilineatus* Steph.					1		2	11	1		1	3
DC		*Carpelimus fuliginosus* (Grav.)									1			
UU		*Carpelimus spp.*		4	1	1								
UU		*Anotylus rugosus* (F.)					2		4	57	1	3	1	3
DF		*Anotylus sculpturatus* (Grav.)	1	1	1	2			3					
DU		*Anotylus nitidulus* (Grav.)				1		1	3	1				1
DC		*Anotylus complanatus* (Er.)							17		1	2	1	3
DF		*Anotylus tetracarinatus* Block			1		1					1	1	2
DF		*Oxytelus sculptus* Grav.	1			1						8		
GD		*Platystethus cornutus* (Grav.)/*degener* Muls. and Rey	1			4	2				1	2		
GD		*Platystethus alutaceus* Thom.					1							
GD		*Platystethus nitens* (Sahl.)	2		2	8	1		1			1		
UU		*Platystethus sp.*						1						
GD		*Bledius sp.*					1							
UU		*Stenus spp.*			1	1						1		1
GD		*Lathrobium multipunctum* Grav.										1		

Eco	Code	Sample number	900	899	898	897	885	358	281	275	236	228	60	49
DC		*Lathrobium sp.*								1	1			
DF		*Gyrohypnus fracticornis* (Müll.)				2						1		1
DF		*Gyrohypnus angustatus* Steph.							3					1
		Xantholinus linearis (Ol.)					1							
DX		*Xantholinus longiventris* Heer		1		1			1					1
TT	B	*Atrecus affinis* (Payk.)										1		
DU		*Neobisnius villosulus* (Steph.)							1	16				2
UU		*Neobisnius ?prolixus* Er.								1				
DF		*Philonthus politus* (L.)							2	3	3	8		
DC		*Philonthus cephalotes* (Grav.)									2	6	1	1
DF		*Philonthus splendens* (F.)										1		
DC		*Philonthus ventralis* (Grav.)										3	1	
DC		*Philonthus discoideus* (Grav.)												1
DU		*Philonthus spp.*				2	1		2		2	7	2	1
DF		*Creophilus maxillosus* (L.)							2					
UU		*Staphylinus sp.*									1			
DU		*Quedius mesomelinus* (Marsh.)							1			2	1	
UU		*Quedius sp.*	1								1	2	1	1
DF		*Tachinus subterraneus* (L.)				1								1
UU		*Tachinus sp.*				1			1				1	
DF		*Cilea silphoides* (L.)										1		
UU		*Falagria sp.*				1								
DF		*Aleochara sp.*							1			2		
UU		Aleocharinae *gen. indet.*		1	2	2	2		7	10	4	11	3	8
		PSELAPHIDAE												
GD		*Euplectus sp.*				1								
GD		*Bryaxis puncticollis* (Denny)											1	
GD		*Rybaxis longicornis* (Leach)					1							
GD		*Brachygluta fossulata* (Reich.)	2											
		ELATERIDAE												
TT		*Melanotus erythropus* (Gmel.)				1								
UU		*Agrypnus murinus* (L.)								1				
		DERMESTIDAE												
DX		*Anthrenus museorum* (L.)											1	
		NITIDULIDAE												
GA	V	*Brachypterus glaber* (Steph.)		1		2	1							
UU		*Meligethes sp.*				1				1			1	
DX		*Omosita discoidea* (F.)								1		2		
DX		*Omosita colon* (L.)											1	
DX		*Nitidula sp.*										1		
		RHIZOPHAGIDAE												
DF	B	*Rhizophagus parallelocollis* Gyll							2	19				2
UU		*Rhizophagus spp.*			1			1						
		SILVANIDAE												
FG		*Oryzaephilus surinamensis* (L.)					1					1		
		CRYPTOPHAGIDAE												
DX	M	*Cryptophagus spp.*				2	1	1	8	5	7	22	21	11
DX	M	*Atomaria spp.*	1			1			2	2	6	10	5	3
DC		*Ephistemus globulus* (Payk.)							3	1				3
		LATHRIDIIDAE												
HM	M	*Lathridius minutus* group				3			7	6	6	9	20	11
DX	M	*Enicmus transversus* (Ol.)				1							1	
HM	M	*Dienerella ruficollis* (Marsh.)											3	
DX	M	*Corticaria sp.* (Gyll.)								6			3	1
DX	M	*Corticaria serrata* (Payk.)								1			1	2
DX	M	*Cortinicara gibbosa* (Hbst.)											1	
DX	M	*Corticarina fuscula* (Gyll.)											1	
DX	M	Corticariinae *indet.*			1	1	1		1		2	1		
		MYCETOPHAGIDAE												
HM	M	*Typhaea stercorea* (L.)									1			
		COLYDIIDAE												
HF	B	*Aglenus brunneus* (Gyll.)				1					8	8	1	
		ENDOMYCHIDAE												
HM	M	*Mycetaea hirta* (Marsh.)							1		9	32	113	6
		LYCTIDAE												
HT		*Lyctus linearis* (Goez.)	1										1	
		ANOBIIDAE												
TT		*Grynobius planus* (F.)										1		1
HT		*Xestobium rufovillosum* (Deg.)											2	2
HT		*Anobium punctatum* (Deg.)	1		1	3	2		6	1	3	5	41	5
HT		*Ptilinus pectinicornis* (L.)									2			1
		PTINIDAE												
HM	M	*Tipnus unicolor* (Pill.)				1	1					2	19	10
HM	M	*Ptinus fur* (L.)					1		1	1	2	2	8	2
		SCARABAEIDAE												
GP		*Onthophagus sp.*	1											
DU		*Oxyomus sylvestris* (Scop.)	1		1	3	2		3			1	1	

Eco	Code	Sample number	900	899	898	897	885	358	281	275	236	228	60	49
GP		*Aphodius luridus* (F.)								1				
DF		*Aphodius prodromus* (Brahm)				1	1			1				
GP		*Aphodius merdarius* (F.)				1								
GP		*Aphodius sordidus* (F.)							1					
DF		*Aphodius granarius* (L.)							2		1	1	2	
GP		*Aphodius spp.*	2	1		1	3		1		1			1
GP		*Heptaulacus testudinarius* (F.)			1									
GX		*Omaloplia ruricola* (F.)											1	
GA		*Amphimallon solstitialis* (L.)												1
		CERAMBYCIDAE												
HT		*Gracilia minuta* (F.)								1				
		CHRYSOMELIDAE												
GA	V	*Phyllotreta vittula* Redt.					1							1
GA	V	*Phyllotreta spp.*	2									1	1	2
GA	V	*Longitarsus spp.*				1			1					
GA	V	*Chaetocnema concinna* (Marsh.)							1					
		BRUCHIDAE												
FL		*Bruchus rufimanus* Bohe.				1?			4	1		1	1	1
		SCOLYTIDAE												
TT		*Scolytus multistriatus* Marsh.								1				
		APIONIDAE												
UU	V	*Apion spp.*	1	1		1							1	
		CURCULIONIDAE												
UU	V	*Sitona spp.*											1	
UU	V	*Tychius sp.*												1
GA	V	*Ceutorhynchus erysimi* (F.)				2								
UU	V	*Ceutorhynchus spp.*				2	2			1				
UU	V	*Gymnetron spp.*			1	1	1							

Table 7.3: Winchester, Roman assemblages in rank order

Combined assemblage from ditches (F1706; F1697)	**MNI**
Platystethus nitens (Sahl.)	13
Cercyon (3) spp.	9
Platystethus degener Muls. & Rey	7
Anobium punctatum (Deg.)	7
Oxyomus sylvestris (Scop.)	7
Aphodius (2) spp..	7
Carpelimus spp.	6
Aleocharinae gen. Indet.	6
Sphaeridium spp.	5
Anotylus sculpturatus (Grav.)	5
Philonthus spp.	4
Brachypterus glaber (Steph.)	4
Omalium caesum Grav.	3
Cryptophagus spp.	3
Lathridius minutus group	3
Corticaria cremulata (Gyll.)	3
Apion (2) spp.	3
Ceutorhynchus (2) spp.	3
Gymnetron sp.	3
Nebria sp.	2
Trechus obtusus/4-striatus	2
Helophorus spp.	2
Cercyon analis (Payk.)	2
Berosus affinis Brul.	2
Omalium rivulare (Payk.)	2
Anotylus rugosus (F.)	2
Anotylus tetracarinatus Block	2
Oxytelus sculptus Grav.	2
Stenus sp.	2
Gyrohypnus fracticornis (Müll.)	2
Xantholinus longiventris Heer	2
Brachygluta fossulata (Reich.)	2
Atomaria spp.	2
Tipnus unicolor (Pill.)	2
Aphodius prodromus (Brahm)	2
Ceutorhynchus erysimi (F.)	2
Clivina fossor (L.)	1
Trechus micros (Hbst.)	1
Pterostichus spp.	1
Limnebius truncatellus (Thun.)	1
Helophorus aquaticus (L.) auct.	1
Megasternum obscurum (Marsh.)	1
Acritus nigricornis (Hoff.)	1
Scydmaenus tarsatus Müll. & Kunze	1
Ptenidium sp.	1
Proteinus ovalis Steph.	1
Proteinus sp.	1
Dropephylla vilis (Er.)	1
Xylodromus concinnus (Marsh.)	1
Carpelimus bilineatus Steph.	1
Anotylus nitidulus (Grav.)	1
Platystethus alutaceus Thom.	1

Cont.	**MNI**
Bledius sp.	1
Xantholinus linearis (Ol.)	1
Tachinus subterraneus (L.)	1
Tachinus sp.	1
Falagria sp.	1
Euplectus sp.	1
Rybaxis longicornis (Leach)	1
Melanotus erythropus (Gmel.)	1
Meligethes sp.	1
Rhizophagus spp.	1
Oryzaephilus surinamensis (L.)	1
Enicmus transversus (Ol.)	1
Aglenus brunneus (Gyll.)	1
Lyctus linearis (Goez.)	1
Ptinus fur (L.)	1
Onthophagus sp.	1
Aphodius merdarius (F.)	1
Heptaulacus testudinarius (F.)	1
Phyllotreta vittula Redt.	1
Phyllotreta consobrina (Curt.)	1
Longitarsus spp.	1
Bruchus ?rufimanus Bohe.	1
Total MNI	173
Total MNS	79

Table 7.4: Winchester, Early medieval assemblages in rank order

Assemblage from Pit (F5961)	MNI
Anotylus complanatus (Er.)	17
Cryptophagus (3) spp.	8
Aleocharinae gen. indet. (4) spp.	7
Lathridius minutus group	7
Anobium punctatum (Deg.)	6
Coprophilus striatulus (F.)	4
Anotylus rugosus (F.)	4
Bruchus rufimanus Bohe.	4
Xylodromus concinnus (Marsh.)	3
Anotylus sculpturatus (Grav.)	3
Anotylus nitidulus (Grav.)	3
Gyrohypnus angustatus Steph.	3
Ephistemus globulus (Payk.)	3
Oxyomus sylvestris (Scop.)	3
Cercyon haemorrhoidalis (F.)	2
Cercyon spp.	2
Omalium rivulare (Payk.)	2
Carpelimus bilineatus Steph.	2
Philonthus politus (L.)	2
Philonthus (2) spp.	2
Creophilus maxillosus (L.)	2
Rhizophagus parallelocollis Gyll	2
Atomaria spp.	2
Aphodius granarius (L.)	2
Trechus micros (Hbst.)	1
Pterostichus melanarius (Ill.)	1
Acritus nigricornis (Hoff.)	1
Hister sp.	1
Micropeplus fulvus Er.	1
Platystethus nitens (Sahl.)	1
Xantholinus longiventris Heer	1
Neobisnius villosulus (Steph.)	1
Quedius mesomelinus (Marsh.)	1
Tachinus sp.	1
Aleochara sp.	1
Corticariinae indet.	1
Mycetaea hirta (Marsh.)	1
Ptinus fur (L.)	1
Aphodius sordidus (F.)	1
Aphodius sp.	1
Longitarsus sp.	1
Chaetocnema concinna (Marsh.)	1
Total MNI	113
Total MNS	43

Assemblage from Pit (F5799)	MNI
Anotylus rugosus (F.)	57
Rhizophagus parallelocollis Gyll	19
Neobisnius villosulus (Steph.)	16
Carpelimus bilineatus Steph.	11
Coprophilus striatulus (F.)	10
Aleocharinae gen. indet. (3) spp.	10
Lathridius minutus group	6
Corticaria sp.	6
Cryptophagus spp.	5
Omalium rivulare (Payk.)	4
Xylodromus concinnus (Marsh.)	3
Philonthus politus (L.)	3
Cercyon (2) spp.	2
Ptenidium (2) spp.	2
Atomaria sp.	2
Trechus micros (Hbst.)	1
Bembidion lampros (Hbst.)	1
Pterostichus spp.	1
Limnebius sp.	1
Cercyon haemorrhoidalis (F.)	1
Anotylus nitidulus (Grav.)	1
Lathrobium sp.	1
Neobisnius ?prolixus Er.	1
Agrypnus murinus (L.)	1
Meligethes sp.	1
Omosita discoidea (F.)	1
Ephistemus globulus (Payk.)	1
Corticaria serrata (Payk.)	1
Anobium punctatum (Deg.)	1
Ptinus fur (L.)	1
Aphodius luridus (F.)	1
Aphodius prodromus (Brahm)	1
Gracilia minuta (F.)	1
Bruchus rufimanus Bohe.	1
Scolytus multistriatus Marsh.	1
Ceutorhynchus sp.	1
Total MNI	177
Total MNS	38

Table 7.4: Continued

Lower assemblage from (F5726)	MNI
Omalium allardi Fairm.& Bris	20
Mycetaea hirta (Marsh.)	9
Aglemus brunneus (Gyll.)	8
Cryptophagus (2) spp.	7
Xylodromus concinnus (Marsh.)	6
Atomaria sp.	6
Lathridius minutus group	6
Ptenidium spp.	4
Aleocharinae gen. indet. (3) spp.	4
Philonthus politus (L.)	3
Anobium punctatum (Deg.)	3
Cercyon analis (Payk.)	2
Cercyon (2 spp.)	2
Hister merdarius Hoff.	2
Philonthus cephalotes (Grav.)	2
Philonthus spp.	2
Corticariinae indet. (2) spp.	2
Ptilimus pectinicornis (L.)	2
Ptimus fur (L.)	2
Clivina fossor (L.)	1
Trechus micros (Hbst.)	1
Pterostichus nigrita (Payk.)	1
Pterostichus melanarius (Ill.)	1
Laemostenus terricola (Hbst.)	1
Helophorus spp.	1
Dendrophilus punctatus (Hbst.)	1
Eutheia sp.	1
Dropephylla sp.	1
Carpelimus bilineatus Steph.	1
Carpelimus fuliginosus (Grav.)	1
Anotylus rugosus (F.)	1
Anotylus complanatus (Er.)	1
Platystethus cornutus (Grav.)	1
Lathrobium sp.	1
Staphylinus sp.	1
Quedius sp.	1
Typhaea stercorea (L.)	1
Aphodius granarius (L.)	1
Aphodius spp.	1
Total MNI	112
Total MNS	37

Upper assemblage from (F5726)	MNI
Mycetaea hirta (Marsh.)	32
Ptenidium (2) spp.	29
Cercyon analis (Payk.)	24
Cryptophagus (2)spp.	22
Aleocharinae gen. indet. (4) spp.	11
Atomaria spp.	10
Lathridius minutus group	9
Oxytelus sculptus Grav.	8
Philonthus politus (L.)	8
Aglenus brunneus (Gyll.)	8
Philonthus (2) spp.	7
Xylodromus concinnus (Marsh.)	6
Philonthus cephalotes (Grav.)	6
Anobium punctatum (Deg.)	5
Phyllodrepa floralis (Payk.)	5
Anotylus rugosus (F.)	3
Philonthus ventralis (Grav.)	3
Tipnus unicolor (Pill.)	2
Omalium allardi Fairm.& Bris	2
Anotylus complanatus (Er.)	2
Ptinus fur (L.)	2
Quedius (2) spp.	2
Platystethus cornutus (Grav.)	2
Quedius mesomelinus (Marsh.)	2
Aleochara sp.	2
Omosita discoidea (F.)	2
Catops fuliginosus Er.	2
Omalium rivulare (Payk.)	1
Anotylus tetracarinatus Block	1
Coprophilus striatulus (F.)	1
Bruchus rufimanus Bohe.	1
Trechus obtusus/4-striatus	1
Stenus spp.	1
Gyrohypnus fracticornis (Müll.)	1
Grynobius planus (F.)	1
Corticariinae indet.	1
Oxyomus sylvestris (Scop.)	1
Aphodius granarius (L.)	1
Clivina fossor (L.)	1
Acritus nigricornis (Hoff.)	1
Platystethus nitens (Sahl.)	1
Xylodromus depressus (Grav.)	1
Lathrobium multipunctum Grav.	1
Atrecus affinis (Payk.)	1
Philonthus splendens (F.)	1
Cilea silphoides (L.)	1
Nitidula sp.	1
Oryzaephilus surinamensis (L.)	1
Phyllotreta sp.	1
Total MNI	238
Total MNS	51

Table 7.5: Winchester, Late medieval assemblages in rank order

Assemblage from Pit 5300	MNI
Mycetaea hirta (Marsh.)	113
Anobium punctatum (Deg.)	41
Cryptophagus (3 spp.)	21
Lathridius minutus group	20
Tipnus unicolor (Pill.)	19
Xylodromus concinnus (Marsh.)	8
Ptinus fur (L.)	8
Atomaria (2) spp.	5
Aleocharinae gen. indet. (2) spp.	3
Dienerella ruficollis (Marsh.)	3
Corticaria sp.	3
Helophorus porculus Bed.	2
Coprophilus striatulus (F.)	2
Philonthus (2) spp.	2
Xestobium rufovillosum (Deg.)	2
Aphodius granarius (L.)	2
Trechus obtusus/4-striatus	1
Pterostichus sp.	1
Catops nigrita Er.	1
Micropeplus porcatus (Payk.)	1
Proteinus ovalis Steph.	1
Omalium rivulare (Payk.)	1
Carpelimus bilineatus Steph.	1
Anotylus rugosus (F.)	1
Anotylus complanatus (Er.)	1
Anotylus tetracarinatus Block	1
Philonthus cephalotes (Grav.)	1
Philonthus ventralis (Grav.)	1
Quedius mesomelinus (Marsh.)	1
Quedius sp.	1
Tachinus sp.	1
Bryaxis puncticollis (Denny)	1
Anthrenus museorum (L.)	1
Meligethes sp.	1
Omosita colon (L.)	1
Enicmus transversus (Ol.)	1
Corticaria serrata (Payk.)	1
Cortinicara gibbosa (Hbst.)	1
Corticarina fuscula (Gyll.)	1
Aglenus brunneus (Gyll.)	1
Lyctus linearis (Goez.)	1
Oxyomus sylvestris (Scop.)	1
Omaloplia ruricola (F.)	1
Phyllotreta atra (F.)	1
Bruchus rufimanus Bohe.	1
Apion spp.	1
Sitona spp.	1
Total MNI	285
Total MNS	49

Assemblage from Pit 5013	MNI
Cryptophagus (2) spp.	11
Lathridius minutus group	11
Tipnus unicolor (Pill.)	10
Aleocharinae gen. indet. (3) spp.	8
Xylodromus concinnus (Marsh.)	7
Mycetaea hirta (Marsh.)	6
Anobium punctatum (Deg.)	5
Ptenidium spp.	3
Omalium allardi Fairm.& Bris	3
Carpelimus bilineatus Steph.	3
Anotylus rugosus (F.)	3
Anotylus complanatus (Er.)	3
Atomaria (2) spp.	3
Ephistemus globulus (Payk.)	3
Cercyon analis (Payk.)	2
Cercyon (2) spp.	2
Omalium rivulare (Payk.)	2
Anotylus tetracarinatus Block	2
Neobisnius villosulus (Steph.)	2
Rhizophagus parallelocollis Gyll	2
Corticaria serrata (Payk.)	2
Xestobium rufovillosum (Deg.)	2
Ptinus fur (L.)	2
Trechus micros (Hbst.)	1
Trechus obtusus/4-striatus	1
Pterostichus melanarius (Ill.)	1
Pterostichus sp.	1
Helophorus sp.	1
Cryptopleurum minutum (F.)	1
Nargus sp.	1
Eutheia sp.	1
Phyllodrepa sp.	1
Dropephylla sp.	1
Coprophilus striatulus (F.)	1
Anotylus nitidulus (Grav.)	1
Stenus sp.	1
Gyrohypnus fracticornis (Müll.)	1
Gyrohypnus angustatus Steph.	1
Xantholinus longiventris Heer	1
Philonthus cephalotes (Grav.)	1
Philonthus discoideus (Grav.)	1
Philonthus sp.	1
Quedius sp.	1
Tachinus subterraneus (L.)	1
Corticaria cremulata (Gyll.)	1
Grynobius planus (F.)	1
Ptilinus pectinicornis (L.)	1
Aphodius sp.	1
Amphimallon solstitialis (L.)	1
Phyllotreta vittula Redt.	1
Phyllotreta atra (F.)	1
Phyllotreta sp.	1
Bruchus rufimanus Bohe.	1
Tychius sp.	1
Total MNI	128
Total MNS	55

Fig. 8.1: Street map of Southampton showing the location of the site at Lower High St., described in Chapter 8.

Reproduced with permission from Ordnance Survey.

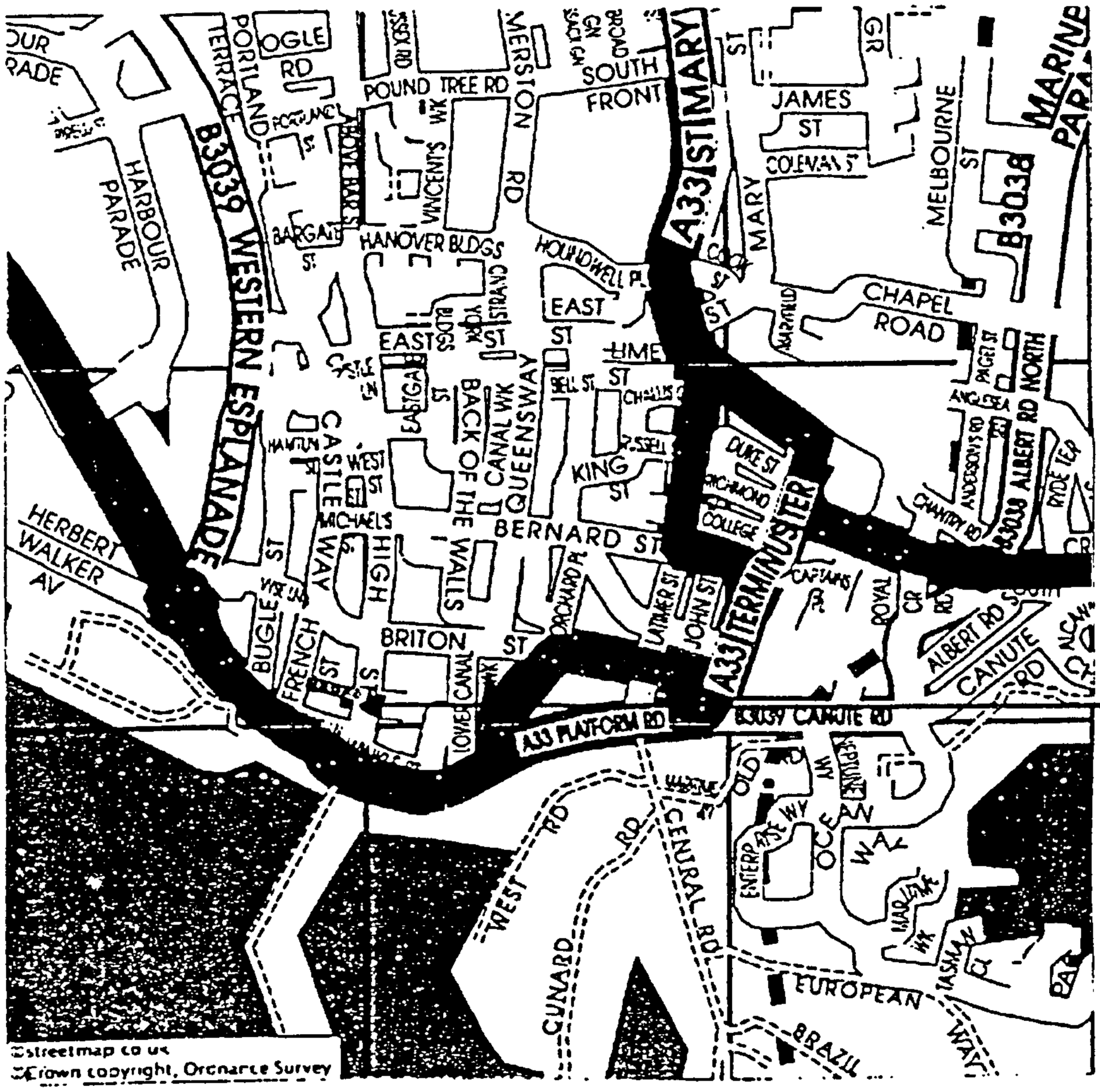


Fig. 8.2: Southampton. Site plan, showing Saxon features (shaded) with the late medieval house superimposed. Sampled features shown in black.

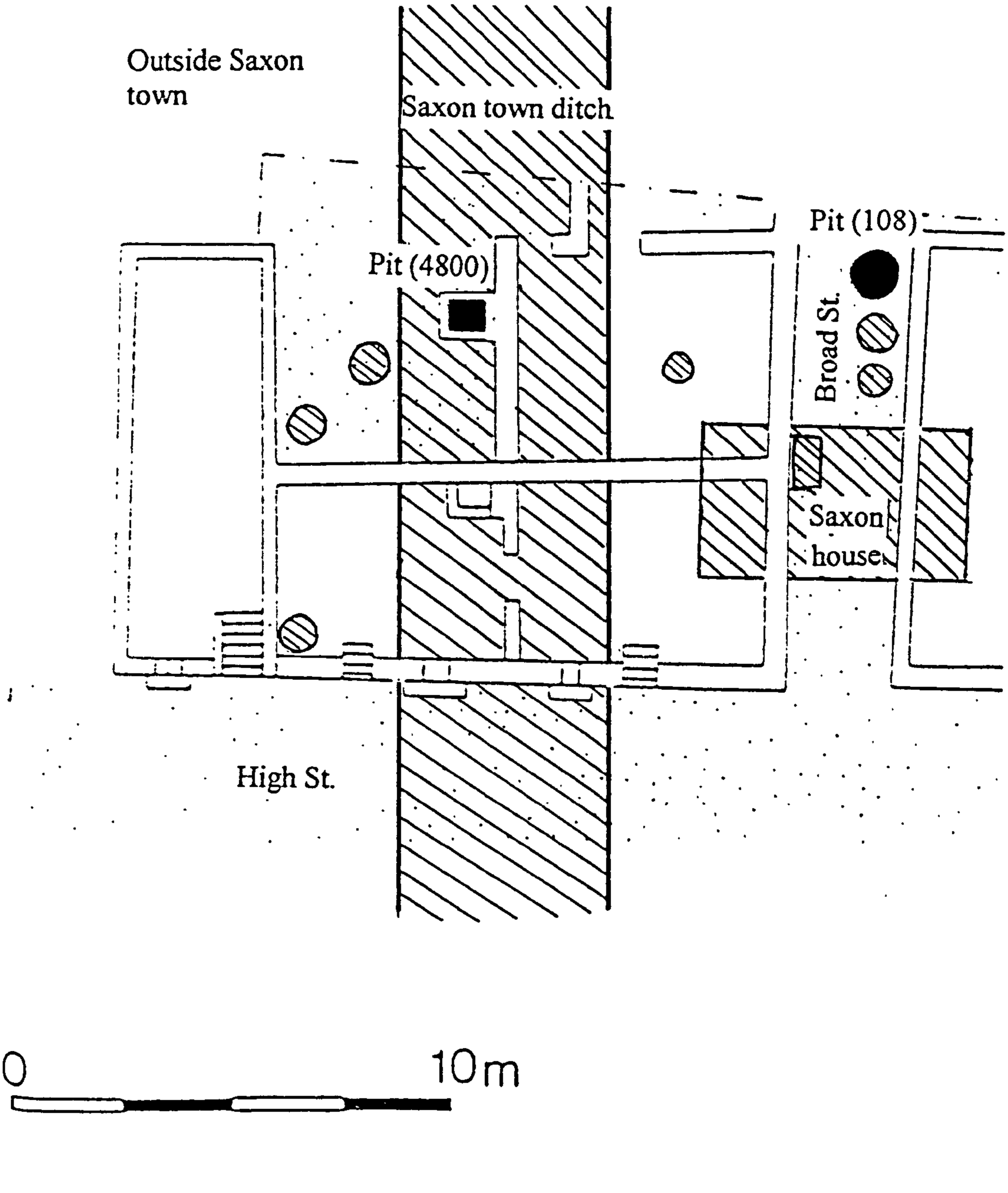
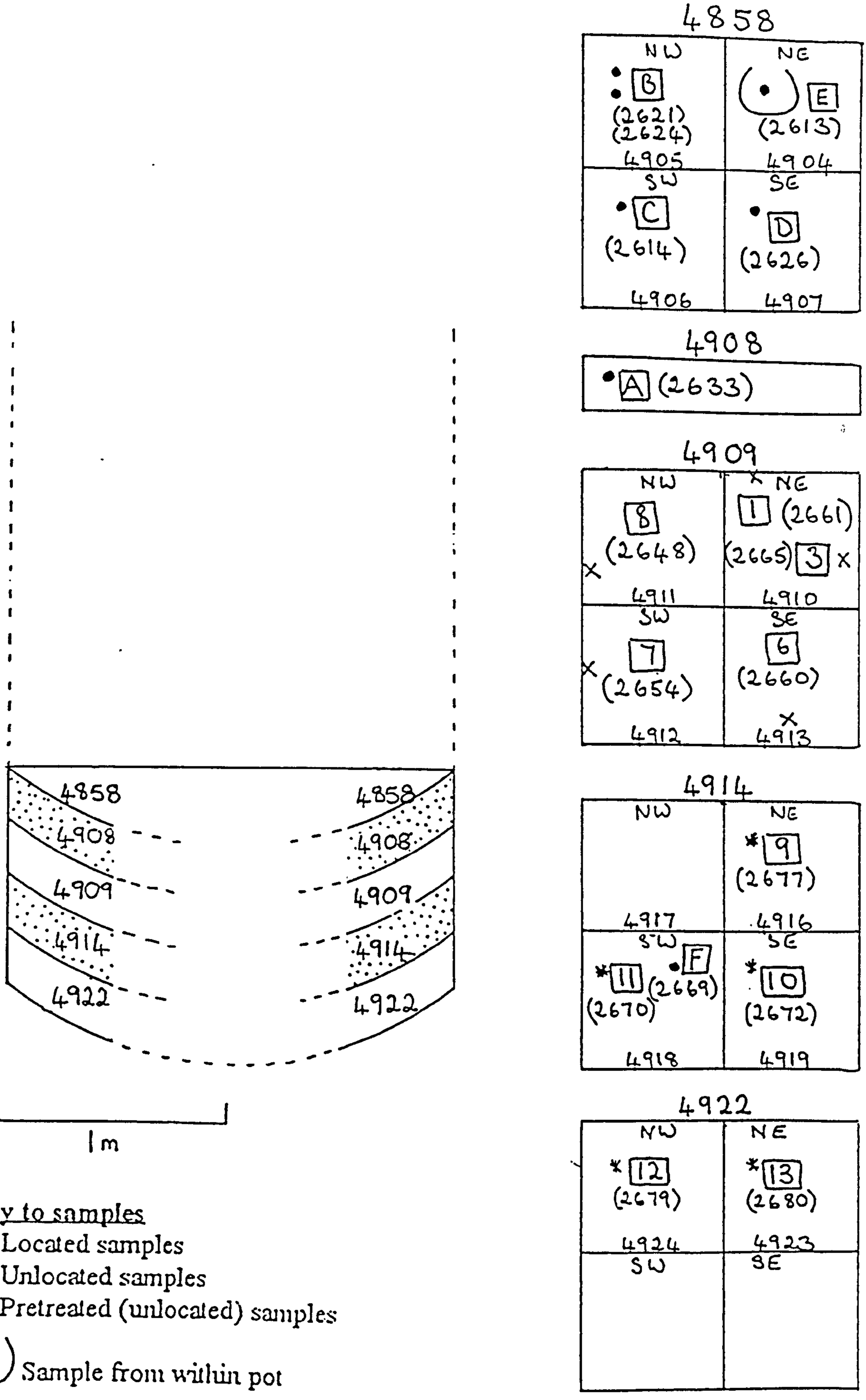


Fig. 8.3: Southampton. Diagrammatic representation of Pit 4800 in section, with plans of the contexts, showing the locations of the sampled areas.



Key to samples

× Located samples

* Unlocated samples

• Pretreated (unlocated) samples

(•) Sample from within pot

Fig. 8.4: Southampton.
Column chart showing the habitats represented by the assemblages.
For key see Fig. 6.1

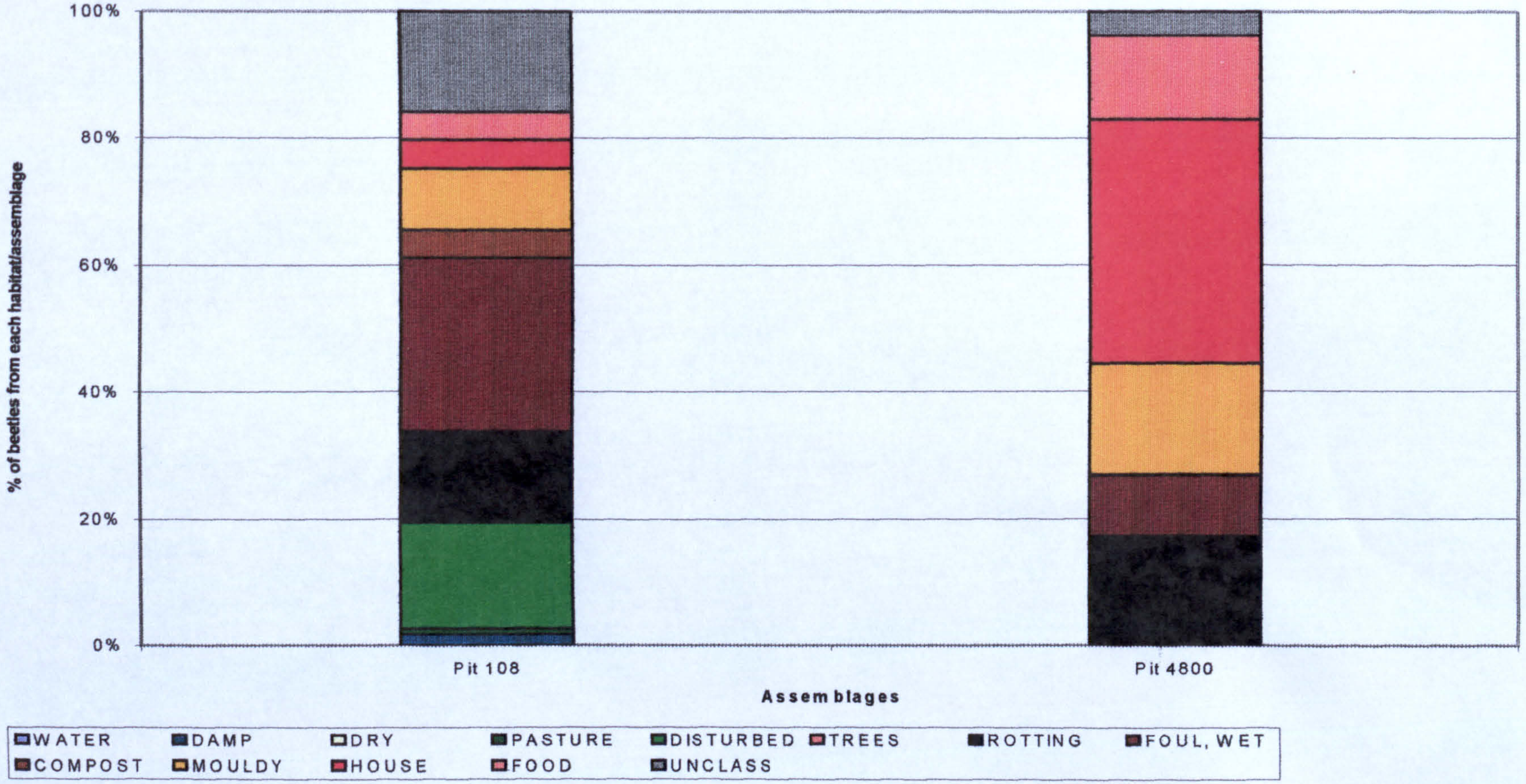


Fig. 8.5: Southampton, Pit 4800, contextual variation
Chart showing the concentration of beetles recovered from each sample.

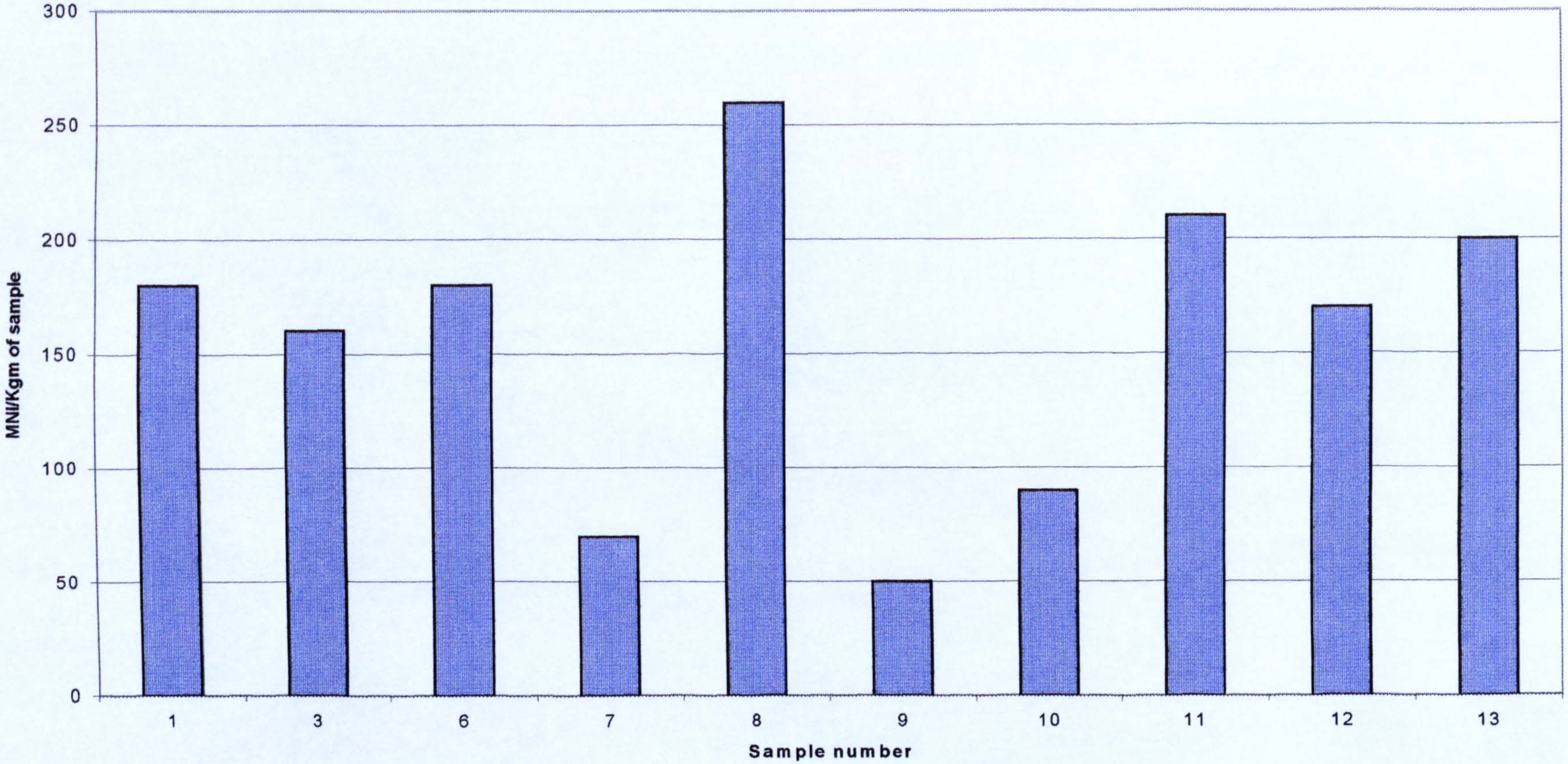


Fig. 8.6: Southampton, Pit 4800, Southampton, Pit 4800, contextual variation
Chart showing inter-contextual differences in the distribution of beetle groups from different habitats.

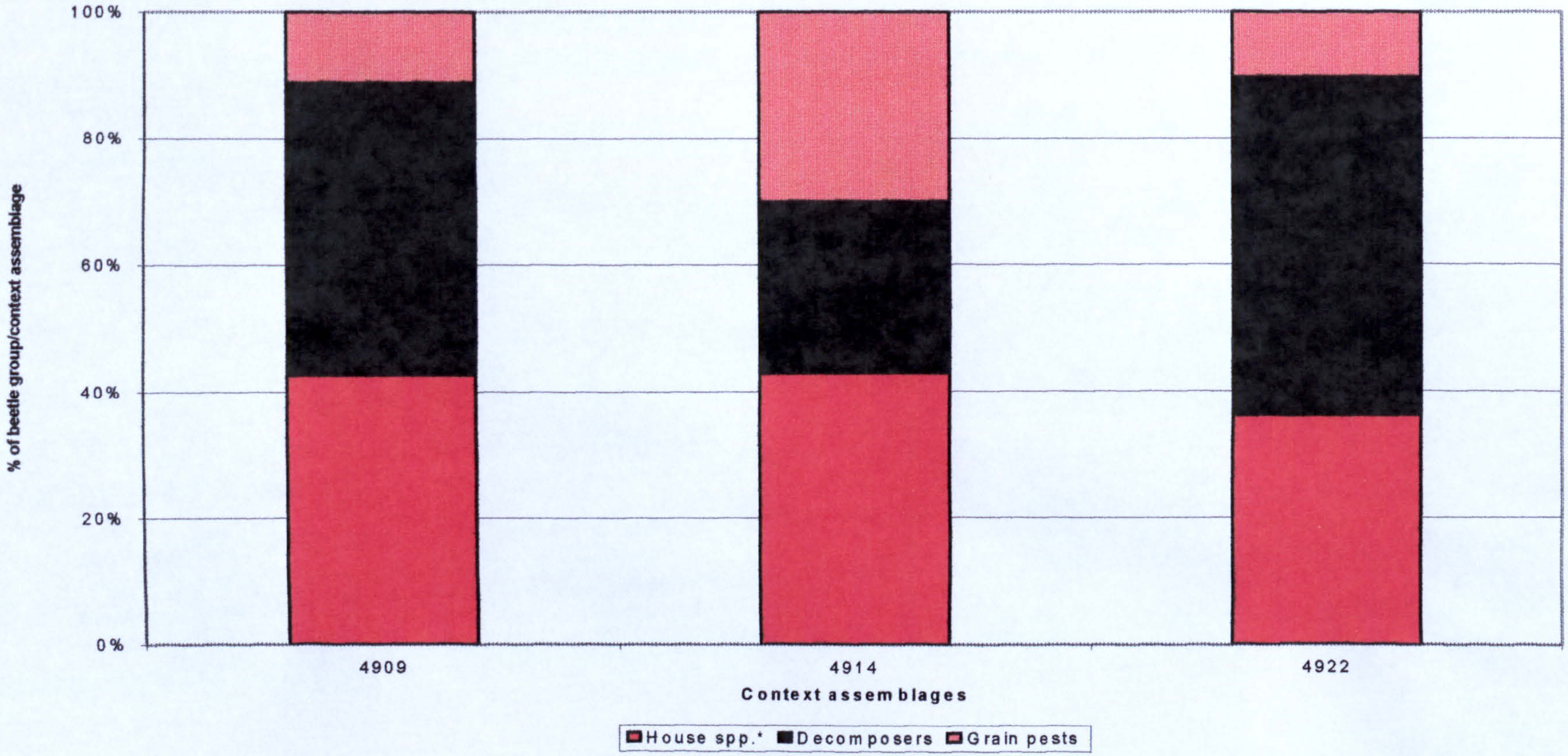


Fig. 8.7: Southampton, Pit 4800, contextual variation
Chart showing the distribution of selected "house beetles" per sample.
Tipnus unicolor and *Anobium punctatum* have been omitted.

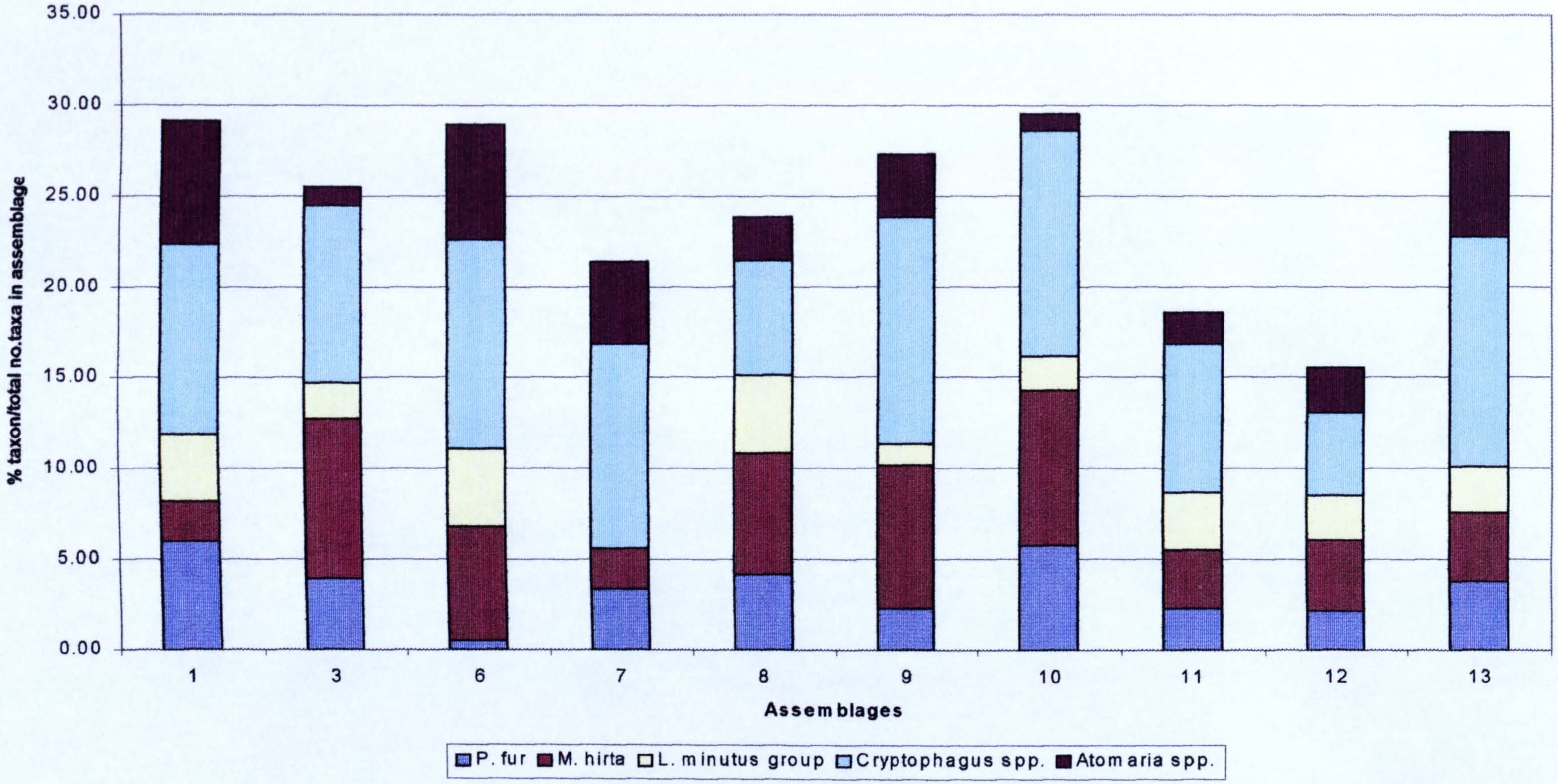


Fig. 8.8: Southampton, Pit 4800, contextual variation
Chart showing the distribution of *Tipnus unicolor* and *Anobium punctatum* per sample.

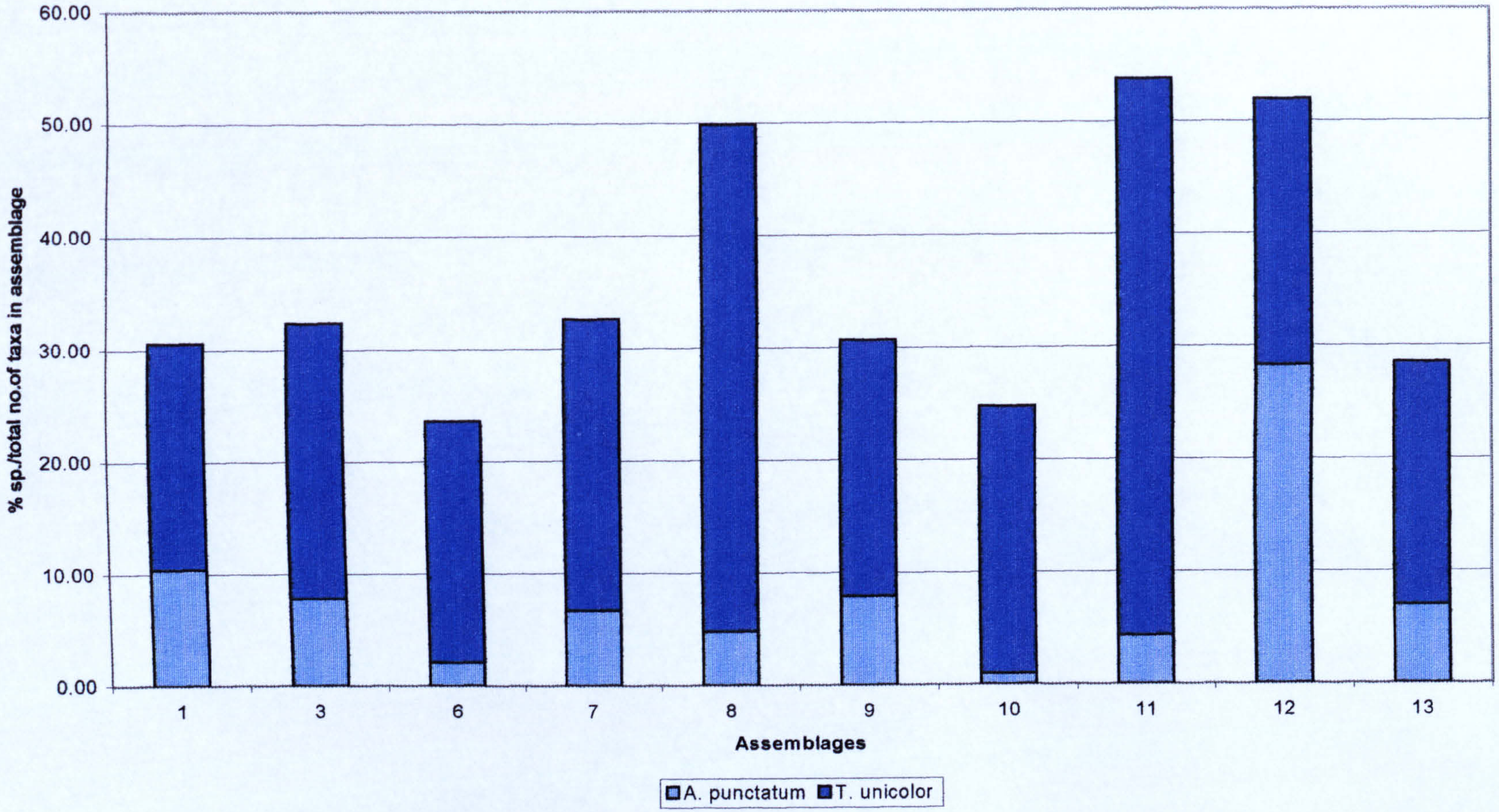


Fig. 8.9: Southampton, Pit 4800, contextual variation.
Chart showing the relationship between the distribution of fly puparia and their predators. The predator numbers are the actual numbers per assemblage, numbers of fly puparia are shown in arbitrary units, see Section 8.4.1.1 for explanation.

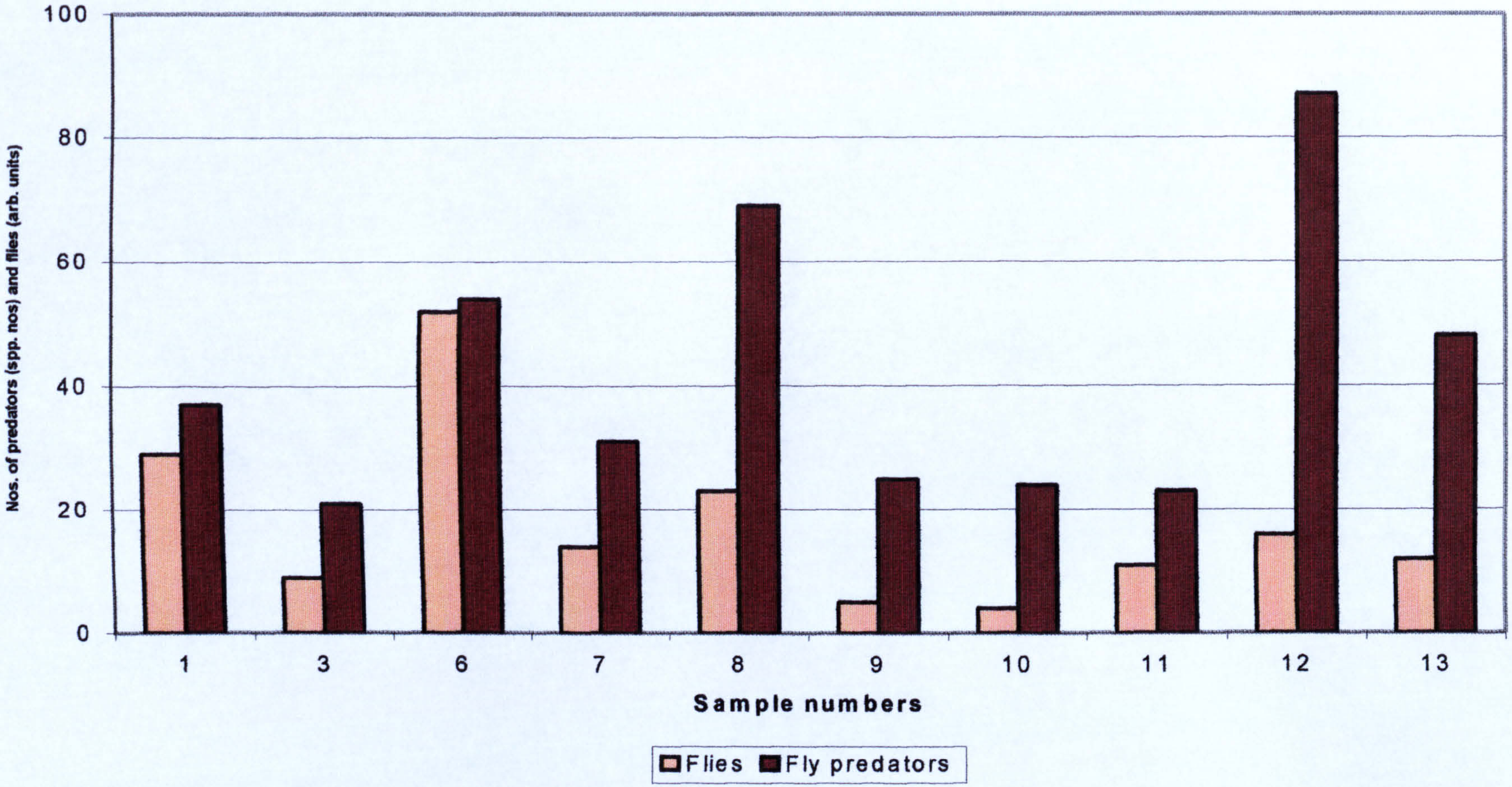


Table 8.1: Southampton, sample details

Sub-sample no.	Wt. of 1000ml sample	Feature	Feature number	Context Number	Period in centuries AD	Comments
1a	1.22kg	Unlined sub-rectangular pit	Pit 108	2165	10th –11th	Fill near base
2a	1.1kg.	Unlined sub-rectangular pit	Pit 108	2165	10th –11th	Fill near base
1	0.75kg	Stone lined Garde-robe pit	Pit 4800	4909	Early 15th	Uppermost fill , fully investigated
3	0.68kg	Stone lined Garde-robe pit	Pit 4800	4909	Early 15th	Uppermost fill , fully investigated
6	1.1kg	Stone lined Garde-robe pit	Pit 4800	4909	Early 15th	Uppermost fill , fully investigated
7	1.48kg	Stone lined Garde-robe pit	Pit 4800	4909	Early 15th	Uppermost fill , fully investigated
8	1.34kg	Stone lined Garde-robe pit	Pit 4800	4909	Early 15th	Uppermost fill , fully investigated
9	1.87kg	Stone lined Garde-robe pit	Pit 4800	4914	Early 15th	"Silty" fill
10	1.28kg	Stone lined Garde-robe pit	Pit 4800	4914	Early 15th	"Silty" fill
11	1.69kg	Stone lined Garde-robe pit	Pit 4800	4914	Early 15th	"Silty" fill
12	1.95kg	Stone lined Garde-robe pit	Pit 4800	4922	Early 15th	Lowest fill
13	0.82kg	Stone lined Garde-robe pit	Pit 4800	4922	Early 15th	Lowest fill

Table 8.2: Southampton, the Coleoptera from the pits
See Section 6.3 and Fig. 6.1 for definition of "eco code" and abbreviations used.
See Table 8.1 for sample details

Eco code	**Sample number.**	**1a**	**2a**	**1**	**3**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
	CARABIDAE												
GD C	*Trechus micros* (Hbst.)												1
HH C	*Laemostenus terricola* (Hbst.)	1	1										
	HYDROPHILIDAE												
DF	*Cercyon haemorrhoidalis* (F.)		1										
DC	*Cercyon analis* (Payk.)		1										
DU	*Cercyon* spp.		4										
	HISTERIDAE												
DX	*Gnathoncus nanus* (Scrib.)					1	1	3		1		1	
	CATOPIDAE												
DU	*Catops fuliginosus* Er.	2	1									1	
DU	*Catops* sp.						1						1
	CLAMBIDAE												
DX	*Calyptomerus dubius* (Marsh.)	1											
	ORTHOPERIDAE												
DC	*Orthoperus* sp.	2	1										
	SCYDMAENIDAE												
GD	Scydmaenidae indet.						1						
	PTILIIDAE												
DX	*Ptenidium* sp.					1							
DX	*Acrotrichis* sp.	1											
	STAPHYLINIDAE												
DF	*Micropeplus porcatus* (Payk.)							1					
DF	*Proteinus ovatus* Steph.						1				1		
DU	*Megarthus depressus* (Payk.)	1											
DU	*Megarthrus* sp.				1		1				1		
DU	*Omalium rivulare* (Payk.)	1	1										
DU	*Omalium excavatum* Steph.		1										
DU	*Omalium allardi* Fairm.& Bris			25	11	28	20	38	13	12	15	55	20
UU	*Carpelimus* sp.		1										
DX	*Xylodromus concinnus* (Marsh.)		1		1	5	1	2		1	8	1	1
DU	*Anotylus rugosus* (F.)					1							
DF	*Anotylus sculpturatus* (Grav.)	4	22					1					
DF	*Anotylus nitidulus* (Grav.)		6									1	
DC	*Anotylus complanatus* (Er.)	3	11										
DF	*Anotylus tetracarinatus* Block	2	4										
GD	*Platystethus degener/cornutus*		1										
GD	*Platystethus nitens* (Sahl.)		1										
UU	*Stenus* sp.	1											
GD	*Bledius* sp.				1								
DF	*Philonthus* spp.	1							1	1	1	2	
DF	*Philonthus concinnus*(Grav.)			1	1	5	1	5		1	1	3	2
DF	*Philonthus cephalotes* (Grav.)			2	2	2	2	6	2	2	1	4	1
DF	*Creophilus maxillosus* (L.)									1			1
UU	*Staphylinus* sp.	1											
DU	*Quedius mesomelinus* (Marsh.)			9	7	19	8	20	10	10	6	25	25
UU	*Quedius* sp.												
UU	*Tachinus* sp.	1	1										
UU	Aleocharinae gen. indet.	5	5	14	2	5	4	9	2	1	6	7	3
	PSELAPHIDAE												
GD	*Euplectus* sp.			1									
GA	*Brachypterus urticae* (F.)		1										

Eco code	Sample number.	1a	2a	1	3	6	7	8	9	10	11	12	13
	NITIDULIDAE												
UU V	*Meligethes aeneus* (F.)					1							
	RHIZOPHAGIDAE												
DF	*Rhizophagus parallelocollis* Gyll.									2			1
	CUCUJIDAE												
FC	*Oryzaephilus surinamensis* (L.)						1	3			1	1	
TT	*Pediacus dermestoides* (F.)									1			
FC	*Cryptolestes ferrugineus* (Steph.)			1	2	3	1	1	1	2	14	2	3
	CRYPTOPHAGIDAE												
DX M	*Cryptophagus* spp.		4	14	10	22	10	21	11	13	28	15	20
DX M	*Atomaria* spp.		2	9	1	12	4	8	3	1	6	8	9
	LATHRIDIIDAE												
HH M	*Lathridius minutus* (L.)			5	2	8		14	1	2	11	8	4
HH M	*Dienerella ruficollis* (Marsh.)				1			1					
DX M	*Corticaria* spp.				1				1	3	1		
DX M	*Corticarina* spp.					1				1		1	
DX C	Corticariinae indet.	1	1										
	ENDOMYCHIDAE												
HH M	*Mycetaea hirta* (Marsh.)			3	9	12	2	22	7	9	11	13	6
	LYCTIDAE												
HT M	*Lyctus linearis* (Goez.)												1
	BOSTRYCHIDAE												
FC	*Rhyzopertha dominica* (F.)				2	5		1			11	1	
	ANOBIIDAE												
HT	*Xestobium rufovillosum* (Deg.)						1	1					
HT	*Anobium punctatum* (Deg.)	1	2	14	8	4	6	16	7	1	15	93	11
	PTINIDAE												
HH	*Tipnus unicolor* (Pill.)			27	25	41	23	149	20	25	170	78	34
HH	*Ptinus fur* (L.)		1	8	4	1	3	14	2	6	8	7	6
	TENEBRIONIDAE												
FC	*Tribolium* sp.							1		1	4		1
	SCARABAEIDAE												
DX	*Trox scaber* (L.)							1					
GP	*Aphodius pusillus* (Hbst.)						1						
GP	*Aphodius* sp.		1										
	CHRYSOMELIDAE												
UU V	*Phyllotreta nemorum* (L.)		1										
UU V	*Phyllotreta atra* (F.)	2	2										
UU V	*Phyllotreta aerea* Allard	2	1										
	BRUCHIDAE												
FL	*Bruchus rufimanus* Bohe.	2	3	1							1	1	
	CURCULIONIDAE												
UU V	*Apion* spp.	1		1	1								
GA V	*Sitona lineatus* (L.)							1					
GA V	*Hypera punctata* (F.)							1					
FC	*Sitophilus granarius* (L.)			1				1			3	1	
FC	*Sitophilus oryzae* (L.)			2	15	18	4	5	9	20	33	9	13
GA V	*Ceutorhynchus erysimi* (F.)							2					
UU V	*Ceutorhynchus* sp.								1				
UU V	Curculionidae spp.	2											

Table 8.3: Southampton, assemblages in rank order

Total assemblage from Pit 108	**MNI**
Anotylus sculpturatus (Grav.)	26
Anotylus complanatus (Er.)	14
Aleocharinae gen. indet. (3) spp.	10
Anotylus nitidulus (Grav.)	6
Anotylus tetracarinatus Block	6
Bruchus rufimanus Bohe.	5
Cercyon spp. (2) spp.	4
Cryptophagus (2) spp.	4
Phyllotreta atra (F.)	4
Catops fuliginosus Er.	3
Orthoperus sp.	3
Anobium punctatum (Deg.)	3
Phyllotreta sp.	3
Laemostemus terricola (Hbst.)	2
Omalium rivulare (Payk.)	2
Tachinus sp.	2
Atomaria spp. (2) spp.	2
Corticariinae indet. (2) spp.	2
Curculionidae (2 spp.)	2
Cercyon haemorrhoidalis (F.)	1
Cercyon analis (Payk.)	1
Calyptomerus dubius (Marsh.)	1
Acrotrichis sp.	1
Megarthus depressus (Payk.)	1
Omalium excavatum Steph.	1
Xylodromus concinnus (Marsh.)	1
Carpelimus sp.	1
Platystethus degener/cornutus	1
Platystethus nitens (Sahl.)	1
Stenus sp.	1
Philonthus sp.	1
Staphylinus sp.	1
Brachypterus urticae (F.)	1
Ptinus fur (L.)	1
Aphodius sp.	1
Phyllotreta nemorum (L.)	1
Apion sp.	1
Total MNI	121
Total MNS	43

Total assemblage from Pit 4800	**MNI**
Tipnus unicolor (Pill.)	592
Omalium allardi Fairm.& Bris	237
Anobium punctatum (Deg.)	175
Cryptophagus (4) spp.	164
Quedius mesomelinus (Marsh.)	139
Sitophilus oryzae (L.)	134
Mycetaea hirta (Marsh.)	94
Atomaria (2) spp.	61
Ptinus fur (L.)	59
Lathridius minutus group	55
Aleocharinae gen. indet. (2) spp.	53
Cryptolestes ferrugineus (Steph.)	30
Philonthus cephalotes (Grav.) spp.	24
Xylodromus concinnus (Marsh.)	20
Rhyzopertha dominica (F.)	20
Philonthus concinnus (Grav.)	20
Gnathoncus nanus (Scrib.)	7
Tribolium sp.	7
Oryzaephilus surinamensis (L.)	6
Corticaria (2) spp.	6
Philonthus sp.	5
Megarthrus sp.	3
Rhizophagus parallelocollis Gyll.	3
Corticarina (3) spp.	3
Bruchus rufimanus Bohe.	3
Catops sp.	2
Proteinus ovatus Steph.	2
Creophilus maxillosus (L.)	2
Dienerella ruficollis (Marsh.)	2
Xestobium rufovillosum (Deg.)	2
Apion (2) spp.	2
Ceutorhynchus erysimi (F.)	2
Trechus micros (Hbst.)	1
Catops fuliginosus Er.	1
Scydmaenidae sp.	1
Ptenidium sp.	1
Micropeplus porcatus (Payk.)	1
Anotylus rugosus (F.)	1
Anotylus sculpturatus (Grav.)	1
Anotylus nitidulus (Grav.)	1
Bledius sp.	1
Euplectus sp.	1
Meligethes aeneus (F.)	1
Pediacus dermestoides (F.)	1
Lyctus linearis (Goez.)	1
Trox scaber (L.)	1
Aphodius pusillus (Hbst.)	1
Sitona lineatus (L.)	1
Hypera punctata (F.)	1
Ceutorhynchus sp.	1
Total MNI	1952
Total MNS	60

Table 8.4: Southampton, Pit 4800, contextual variation.
Different methods of determining abnormally high levels of taxa in sub-samples.

Samples standardised by: -
Concentration: nos./Kg

Sub-sample no.	**1**	**3**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**2*mean**	**mean**	**median**
T. unicolor	36	37	37	16	111	11	20	**101**	40	42	90	45	37
P. fur	11	6	1	2	10	1	5	5	4	7	10	5	5
M. hirta	4	13	11	1	16	4	7	7	7	7	15	8	7
L. minutus	7	3	7	0	10	1	2	7	4	5	9	4	5
Cryptophagus	19	15	20	7	16	6	10	17	8	25	28	14	15
Atomaria	12	1	11	3	6	2	1	4	4	11	11	5	4
X. concinnus	0	0	1	0	0	0	0	1	0	0	0	0	0
A. punctatum	19	12	4	4	12	4	1	9	**48**	13	25	12	10
Philonthus	4	4	6	2	8	2	3	2	5	4	8	4	4
Q. mesomelinus	12	10	17	5	15	5	7	4	13	31	24	12	11
O. allardi	33	16	25	14	28	7	9	9	28	25	39	19	20
Aleocharine	**19**	3	5	3	7	1	1	4	4	4	10	5	4
R. dominica	0	3	**5**	0	1	0	0	**7**	1	0	3	2	0
S. oryzae	4	10	10	6	2	18	22	17	6	6	20	10	8
C. ferrugineus	1	3	3	1	1	1	2	**8**	1	4	5	2	1

By volume: nos./l

Sub-sample no.	**1**	**3**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**2*mean**	**mean**	**median**
T. unicolor	27	25	41	23	149	20	25	**170**	78	34	118	59.2	31
P. fur	8	4	1	3	14	2	6	8	7	6	12	5.9	6
M. hirta	3	9	12	2	22	7	9	11	13	6	19	9.4	9
L. minutus	5	2	8	0	14	1	2	11	8	4	11	5.5	5
Cryptophagus	14	10	22	10	21	11	13	28	15	20	33	16.4	15
Atomaria	9	1	12	4	8	3	1	6	8	9	12	6.1	7
X. concinnus	0	1	5	1	2	0	1	8	1	1	4	2	1
A. punctatum	14	8	4	6	16	7	1	15	**93**	11	35	17.5	10
Philonthus	3	3	7	3	11	2	3	2	7	3	9	4.4	3
Q. mesomelinus	9	7	19	8	20	10	9	6	25	25	28	13.8	10
O. allardi	25	11	28	20	38	13	12	15	55	20	47	23.7	20
Aleocharine	**14**	2	5	4	9	2	1	6	7	3	11	5.3	5
R. dominica	0	2	**5**	0	1	0	0	**11**	1	0	4	2	1
S. oryzae	2	15	18	4	5	9	20	33	9	13	26	12.8	11
C. ferrugineus	1	2	3	1	1	1	2	**14**	2	3	6	3	2

By percentage of total nos.

Sub-sample no.	**1**	**3**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**2*mean**	**mean**	**median**
T. unicolor	20	23	21	23	43	22	22	**48**	23	20	53	26.5	23
P. fur	5.8	3.7	0.5	3	4	2	5.2	2.2	2.1	3.6	6	3.2	3
M. hirta	2.2	8.4	6.1	2	6.3	8	7.8	3.1	3.9	3.6	10	5.1	5
L. minutus	3.6	1.9	4.1	0	4	1	1.7	3.1	2.4	2.4	5	2.4	2
Cryptophagus	10	9.3	11	10	6.1	12	11	7.8	4.5	12	19	9.5	10
Atomaria	6.5	0.9	6.1	4	2.3	3	0.9	1.7	2.4	5.4	7	3.4	3
X. concinnus	0	0.9	2.6	1	0.6	0	0.9	2.2	0.3	0.6	2	0.9	1
A. punctatum	10	7.5	2	6	4.6	8	0.9	4.2	**28**	6.6	15	7.7	6
Philonthus	2.2	2.8	3.6	3	3.2	2	2.6	0.6	2.1	1.8	5	2.4	2
Q. mesomelinus	6.5	6.5	9.7	8	5.8	11	7.8	1.7	7.4	15	16	8.0	8
O. allardi	18	10	14	20	11	14	10	4.2	16	12	26	13.1	13
Aleocharine	**10**	1.9	2.6	4	2.6	2	0.9	1.7	2.1	1.8	6	3.0	2
R. dominica	0	1.9	**2.6**	0	0.3	0	0	**3.1**	0.3	0	2	0.8	0
S. oryzae	1.4	14	9.2	4	1.4	10	17	9.2	2.7	7.8	15	7.7	9
C. ferrugineus	0.7	1.9	1.5	1	0.3	1	1.7	**3.9**	0.6	1.8	3	1.5	1

For explanation see text.

Plate 8.1: Southampton, Pit 4800, contextual variation.

Selected samples, showing the composition of the residue after processing for insect remains, disaggregated in water. See text for details, Section 8.4.1.2.

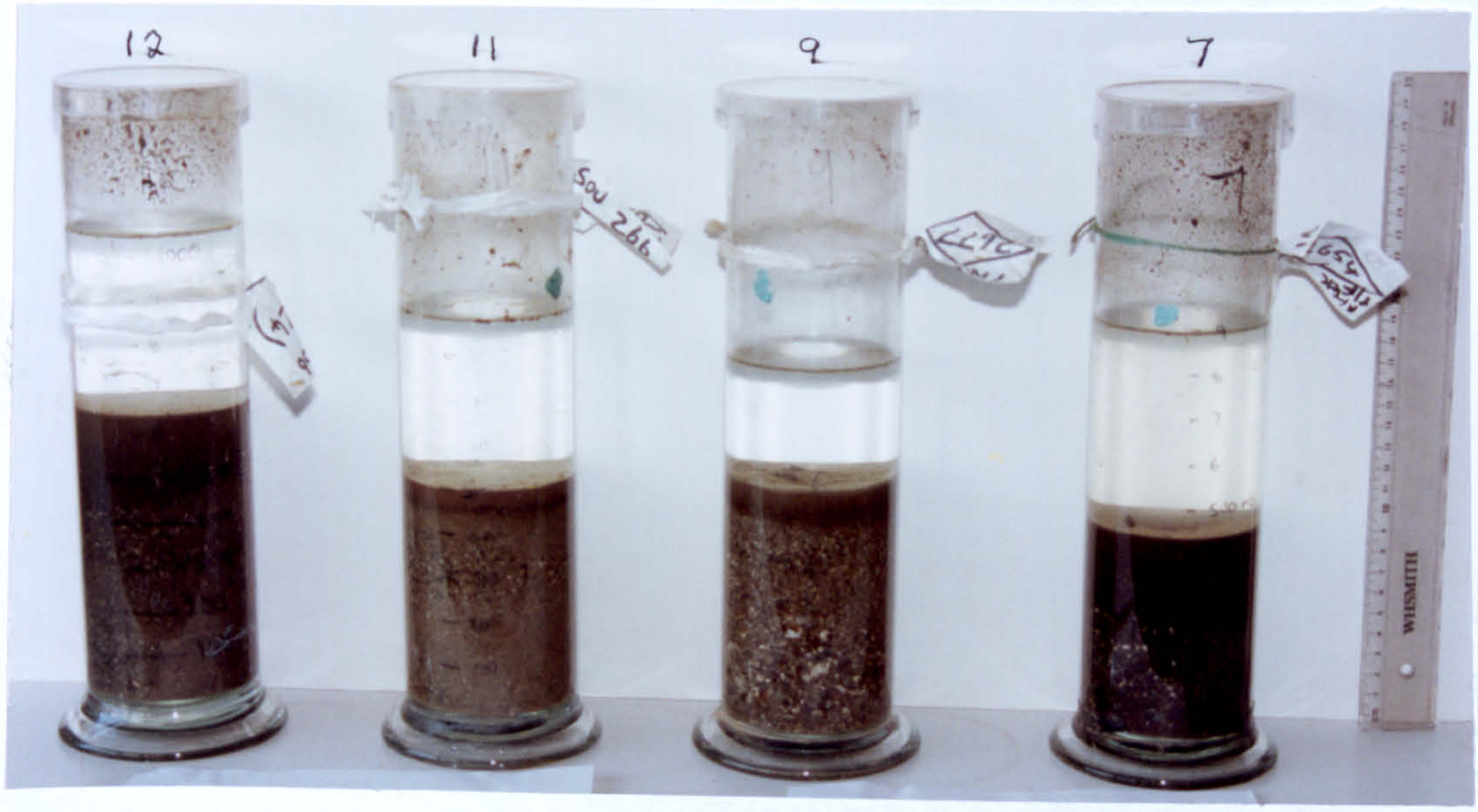


Fig. 9.1: Street map of Chichester showing the location of the Vicars' Hall, described in Chapter 9.

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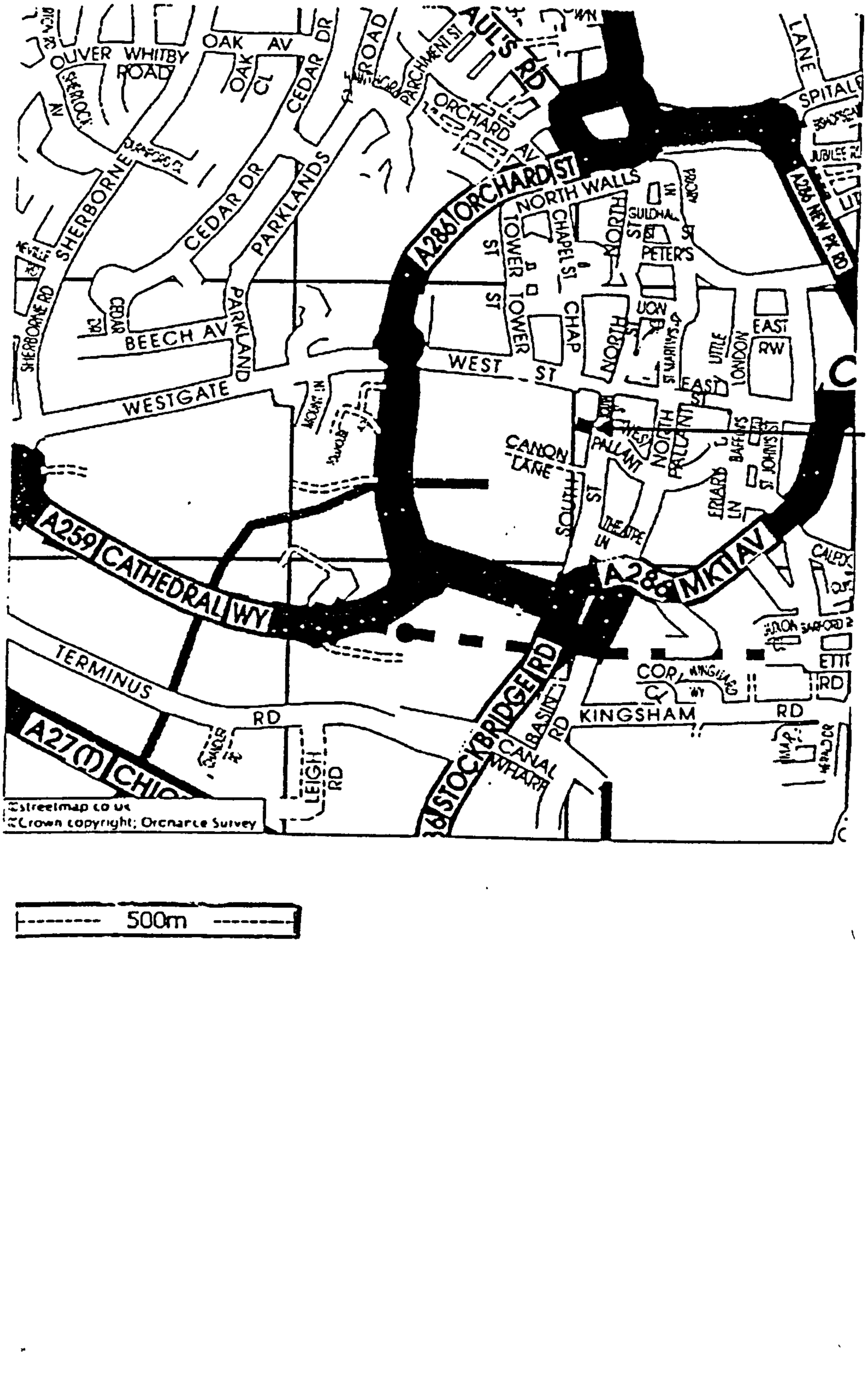
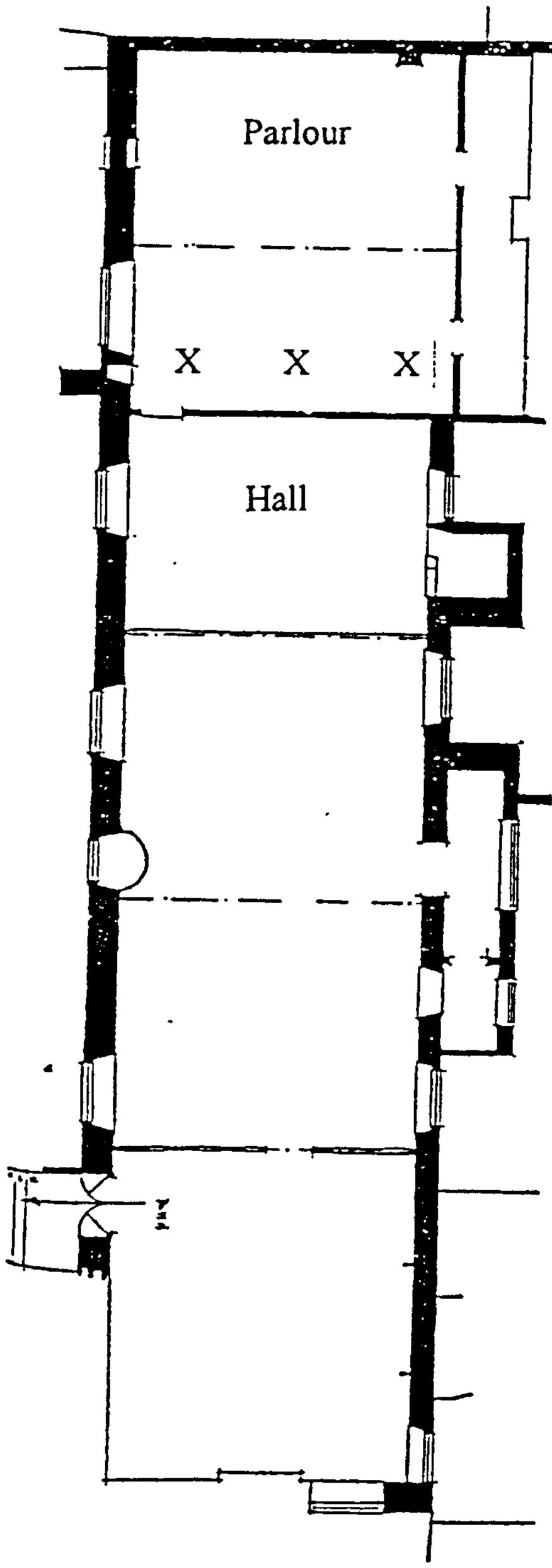


Fig. 9.2: Chichester, Vicars' Hall. Plan of interior of building, sampled areas marked (X).



Scale

0 10 20M

Fig. 9.3: Chichester, Vicars' Hall.
Column chart showing the habitats represented by the assemblages.
For key see Fig. 6.1

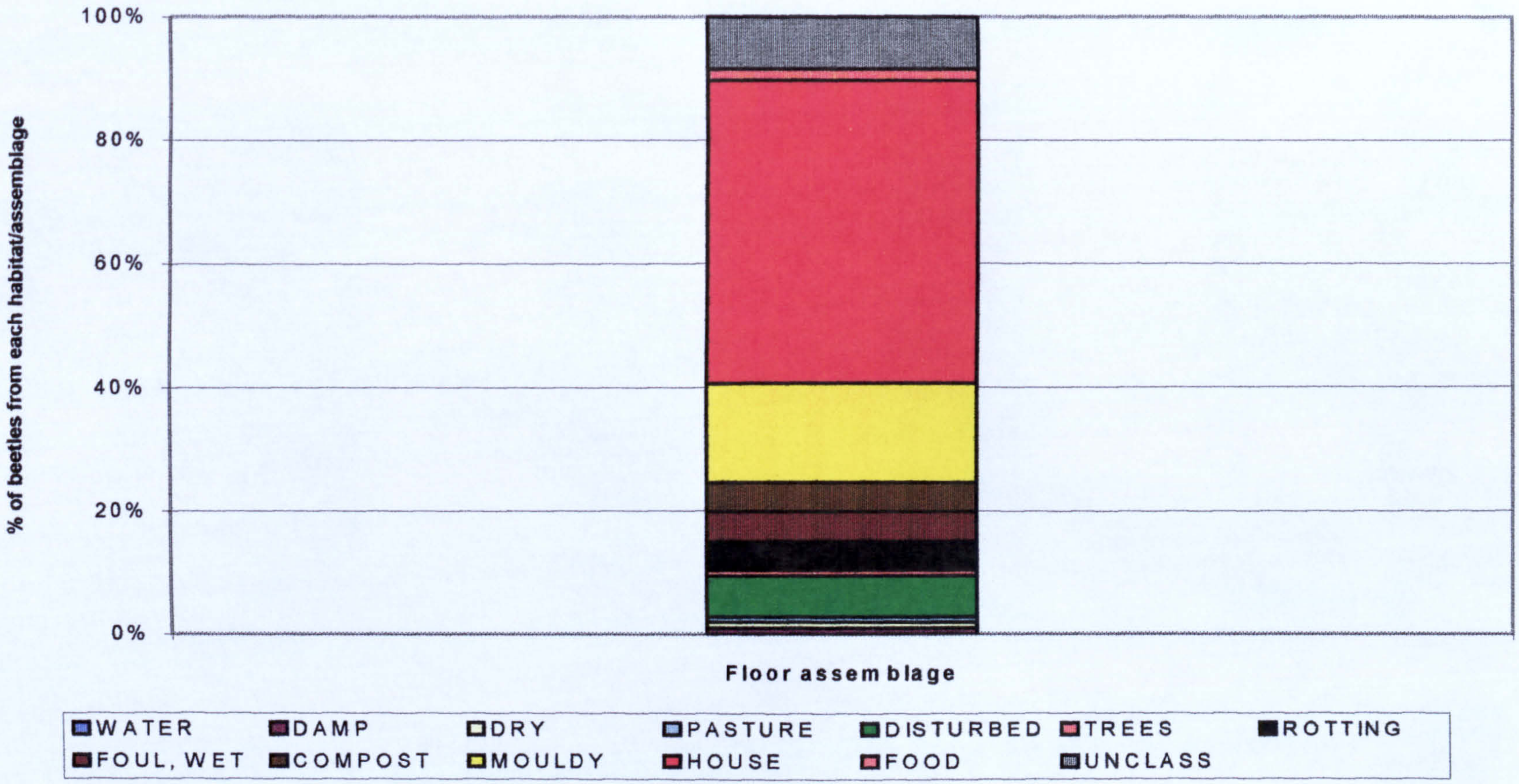


Fig. 9.4: Chichester, Vicars' Hall.
Column chart comparing the proportions of "house" fauna species from three cesspits with those from the Vicars' Hall floor.

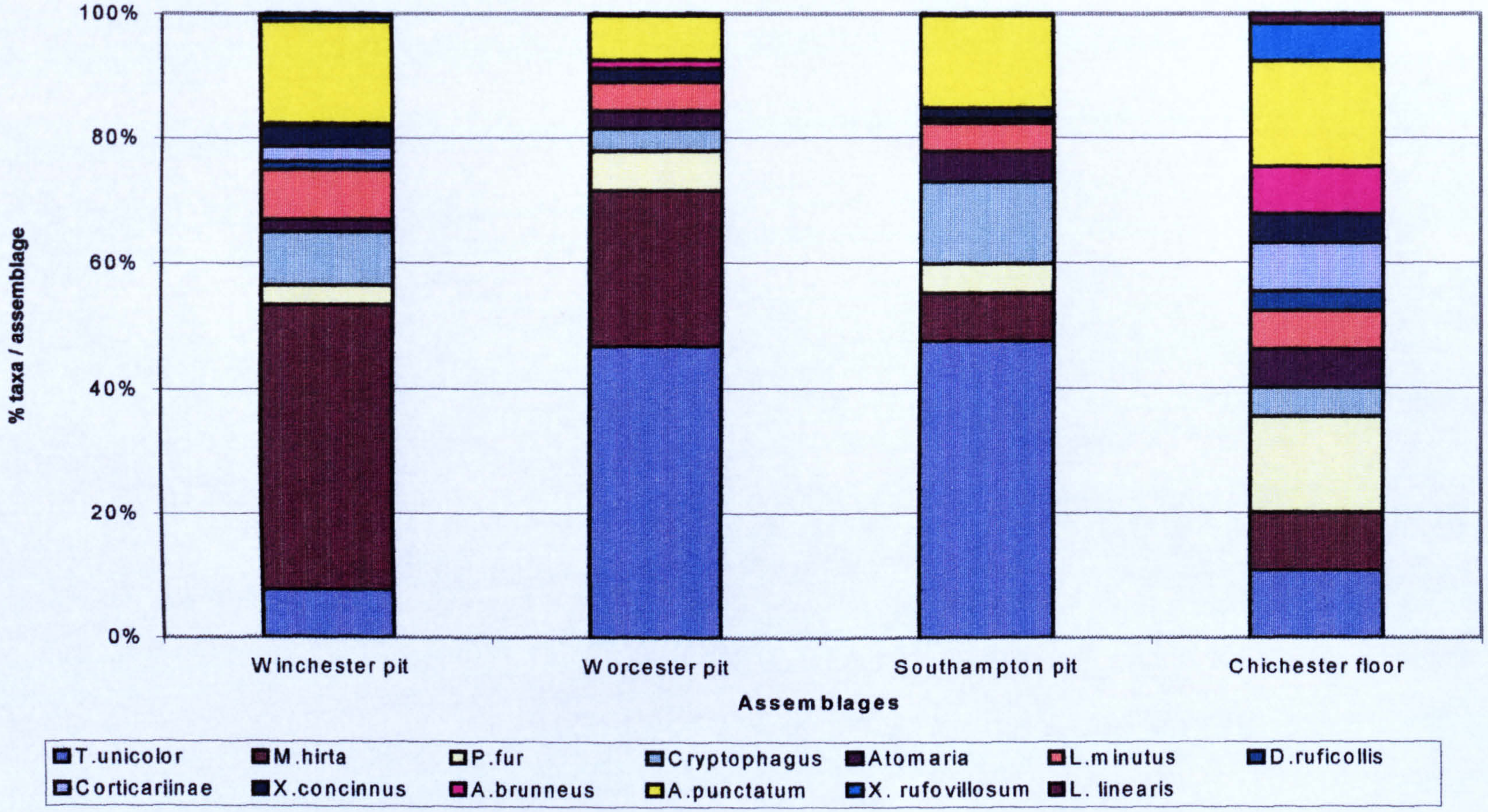


Table 9.1: Chichester, sample details

No	Size in kg	Position in room	Treatment
1s	1.36	West side	Whole sample examined
2s	0.665	Central	Only cleaned pieces above $5mm^3$ examined Seed sample examined
3s	0.62	East side	Only cleaned pieces above $5mm^3$ examined

Table 9.2: Chichester, the Coleoptera recovered from the Vicars' Hall
See Section 6.3 and Fig. 6.1 for definition of "eco code" and abbreviations used.
See Fig. 9.1 and text for sample details

Eco code	Sub-sample numbers	1s	2s	3s
	CARABIDAE			
UU C	*Trechus quadristriatus* Schr.		1	
HH C	*Laemostenus terricola* (Hbst.)		1	
GX C	*Amara* sp.			1
	HYDROPHILIDAE			
DU	*Cercyon* spp.	1		1
	STAPHYLINIDAE			
DX M	*Micropeplus fulvus* Er.			1
DC	*Omalium caesum* Grav.	1		
DX	*Xylodromus concinnus* (Marsh.)		2	2
DF	*Carpelimus bilineatus* Steph.		1	1
DF	*Anotylus sculpturatus* (Grav.)	1		
DU	*Anotylus nitidulus* (Grav.)		1	
GD	*Platystethus cornutus/degener*		1	
UU	*Stenus* sp.		1	
DX	*Xantholinus longiventris* Heer		1	
DU	*Philonthus* sp.			1
UU	*Quedius* sp.	1		
UU	Aleocharinae gen. indet.	1	1	
	RHIZOPHAGIDAE			
DF	*Rhizophagus parallelocollis* Gyll	2		
	CRYPTOPHAGIDAE			
DX M	*Cryptophagus* spp.			3
DX M	*Atomaria* spp.	1	1	1
DC M	*Ephistemus globulus* (Payk.)	1		3
	PHALACRIDAE			
GA V	*Phalacrus* sp.	1		
	LATHRIDIIDAE			
HH M	*Lathridius minutus* group	1	2	1
HH M	*Dienerella ruficollis* (Marsh.)	2		
DX M	*Corticaria* sp.	1	2	1
DX M	*Cortinicara gibbosa* (Hbst.)		1	
	COLYDIIDAE			
HH	*Aglenus brunneus* (Gyll.)		3	2
	ENDOMYCHIDAE			
HH M	*Mycetaea hirta* (Marsh.)	2	3	1
HT	LYCTIDAE			
	Lyctus linearis (Goez.)		1	
	ANOBIIDAE			
HT	*Xestobium rufovillosum* (Deg.)	1	2	1
HT	*Anobium punctatum* (Deg.)	3	4	4
HT	*Ptilinus pectinicornis* (L.)	1		
	PTINIDAE			
HH M	*Tipnus unicolor* (Pill.)	1	4	2
HH M	*Ptinus fur* (L.)	2	3	5
	ANTHICIDAE			
DU	*Anthicus* sp.	1		
	SCARABAEIDAE			
GP	*Onthophagus* sp.	1		
	CHRYSOMELIDAE			
UU V	*Longitarsus* sp.	2	1	1
	BRUCHIDAE			
FL	*Bruchus rufimanus* Bohe.	1		1
	CURCULIONIDAE			
GA V	*Sitona lineatus* (L.)	2	1	1
TT	*Anthonomus* sp.			1
GA V	*Hypera ?fuscocinerea* Marsh.	1		
	Orobitis cyaneus (L.)			1

Table 9.3: Chichester, floor assemblage from Vicars' Hall, in rank order

Total assemblage from floor	**MNI**
Anobium punctatum (Deg.)	11
Ptinus fur (L.)	10
Tipnus unicolor (Pill.)	7
Mycetaea hirta (Marsh.)	6
Aglenus brunneus (Gyll.)	5
Xylodromus concinnus (Marsh.)	4
Ephistemus globulus (Payk.)	4
Lathridius minutus group	4
Corticaria sp.	4
Xestobium rufovillosum (Deg.)	4
Longitarsus sp.	4
Sitona lineatus (L.)	4
Cryptophagus (2) spp.	3
Atomaria (2) spp.	3
Cercyon (2) spp.	2
Carpelimus bilineatus Steph.	2
Aleocharinae gen. indet. (2) spp.	2
Rhizophagus parallelocollis Gyll	2
Dienerella ruficollis (Marsh.)	2
Bruchus rufimanus Bohe.	2
Trechus quadristriatus Schr.	1
Laemostenus terricola (Hbst.)	1
Amara sp.	1
Micropeplus fulvus Er.	1
Omalium caesum Grav.	1
Anotylus sculpturatus (Grav.)	1
Anotylus nitidulus (Grav.)	1
Platystethus cornutus/degener	1
Stenus sp.	1
Xantholinus longiventris Heer	1
Philonthus sp.	1
Quedius sp.	1
Phalacrus sp.	1
Cortinicara gibbosa (Hbst.)	1
Lyctus linearis (Goez.)	1
Ptilinus pectinicornis (L.)	1
Anthicus sp.	1
Onthophagus sp.	1
Anthonomus sp.	1
Hypera ?fuscocinerea Marsh.	1
Orobitis cyaneus (L.)	1
Total MNI	106
Total MNS	45

Fig. 10.1: Map of Fishbourne showing the location of the sites described in Chapter 10

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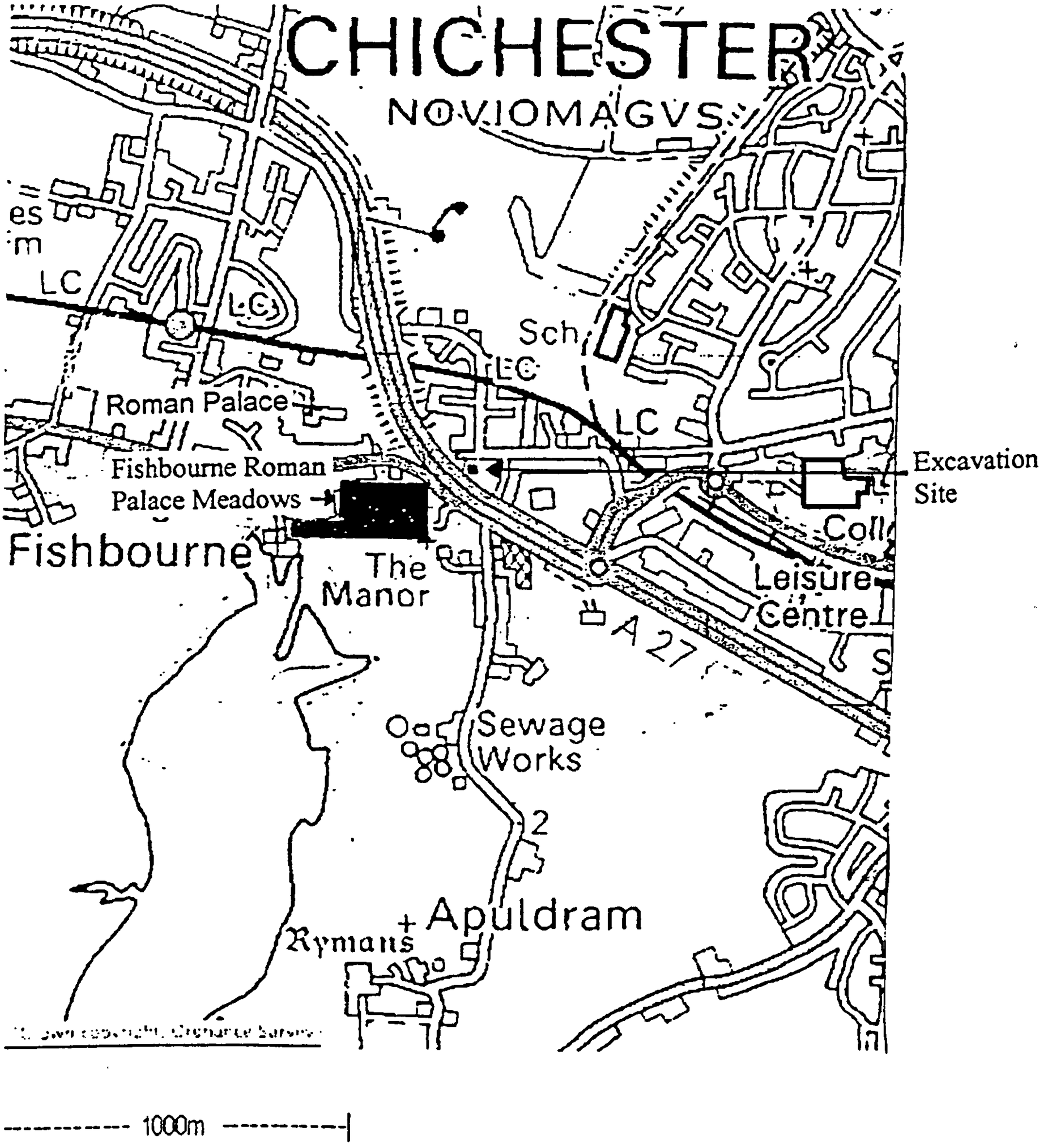

Fig. 10.2: Fishbourne. Site plan showing Roman and later features. Sampled pit (28) shown crosshatched.

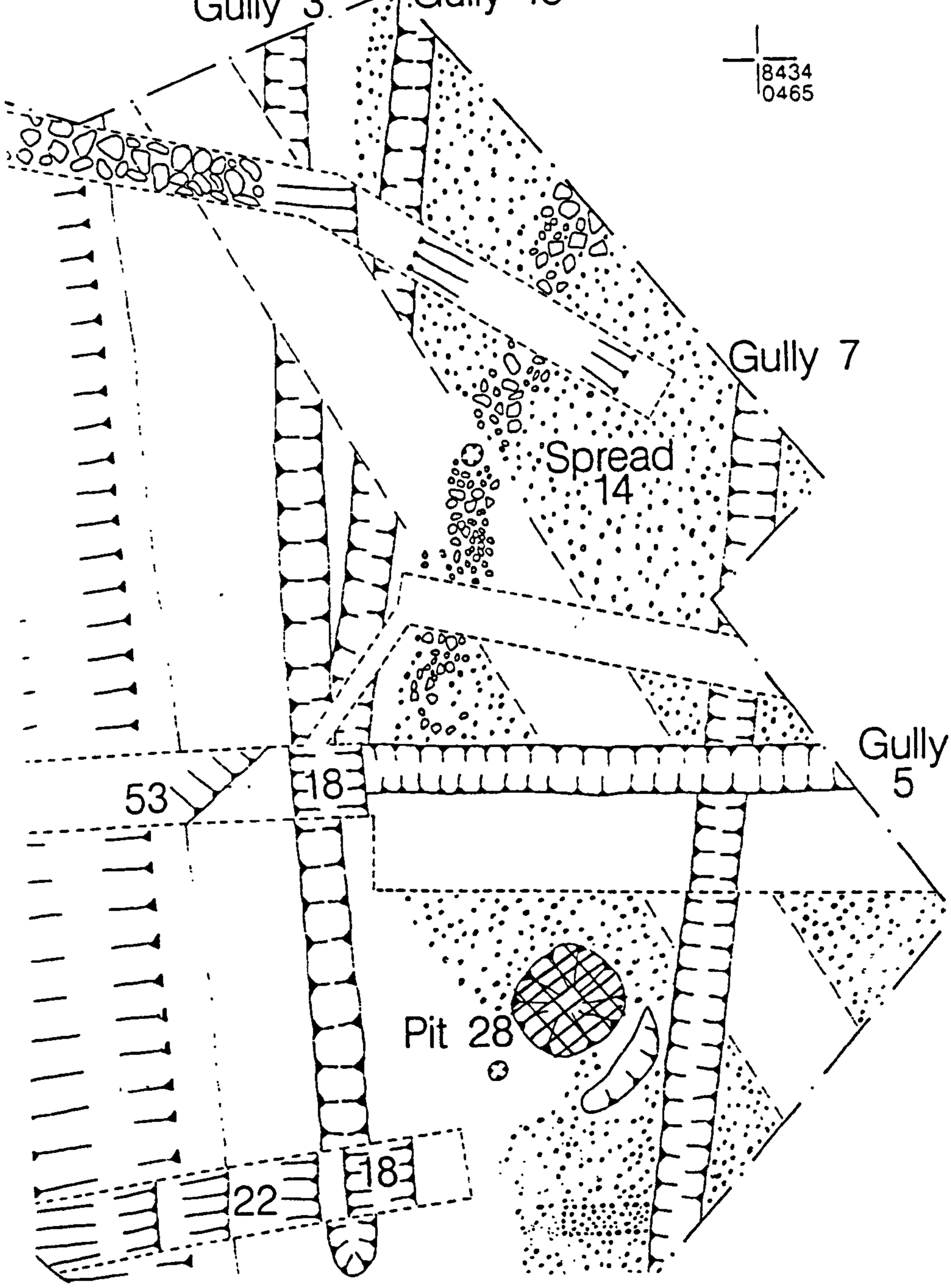

Fig. 10.3: Fishbourne.
Column chart comparing the habitats represented by the assemblages from Pit 28 with the modern ones from the stream, labelled FBPM (Fishbourne Roman Palace Meadows).
For key see Fig. 6.1

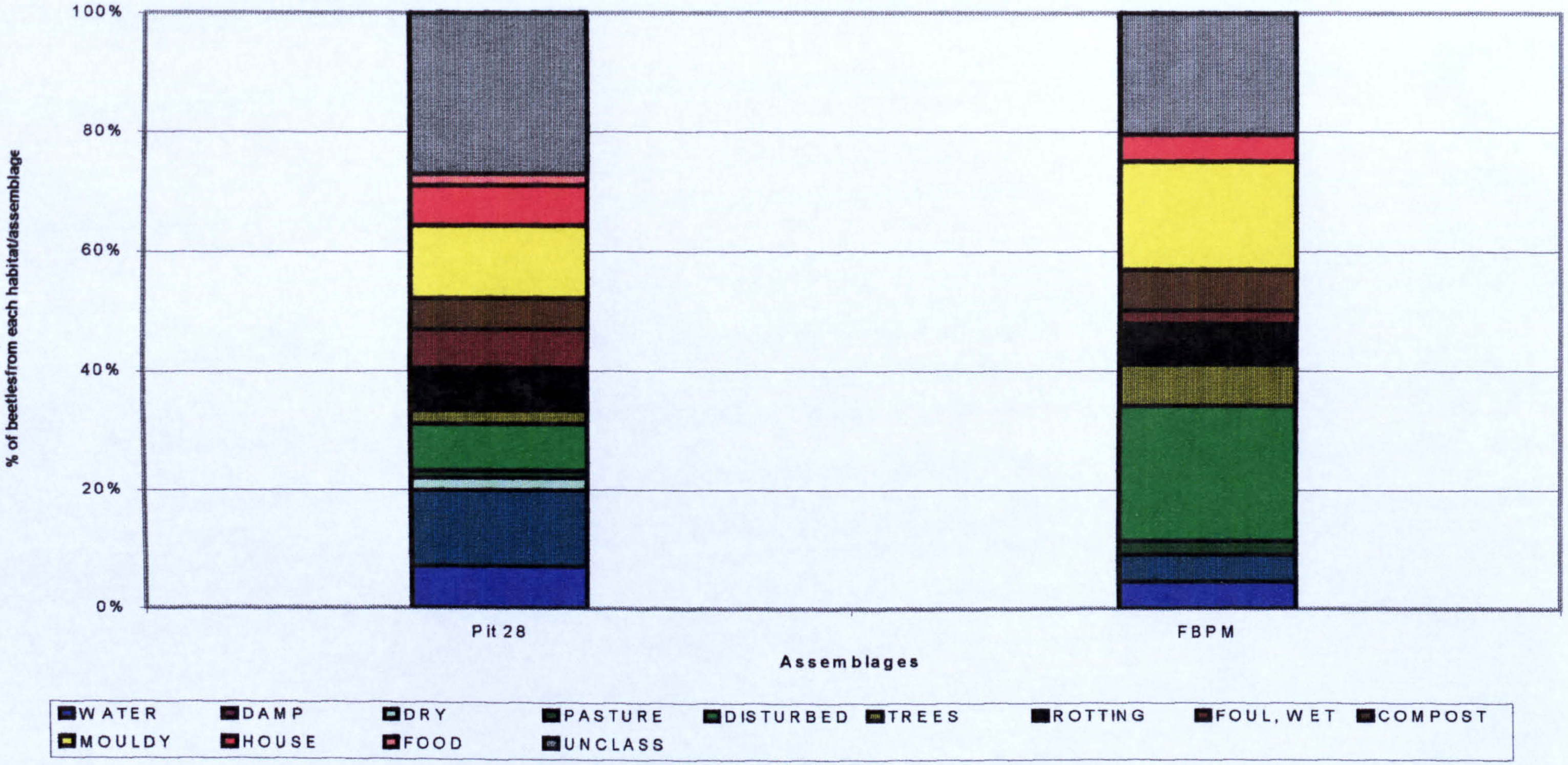

Fig. 10.4: Fishbourne.
Column chart comparing the proportions of different ecological groups, represented by the assemblages from Pit 28 with those from the modern stream sediments (labelled FBPM).

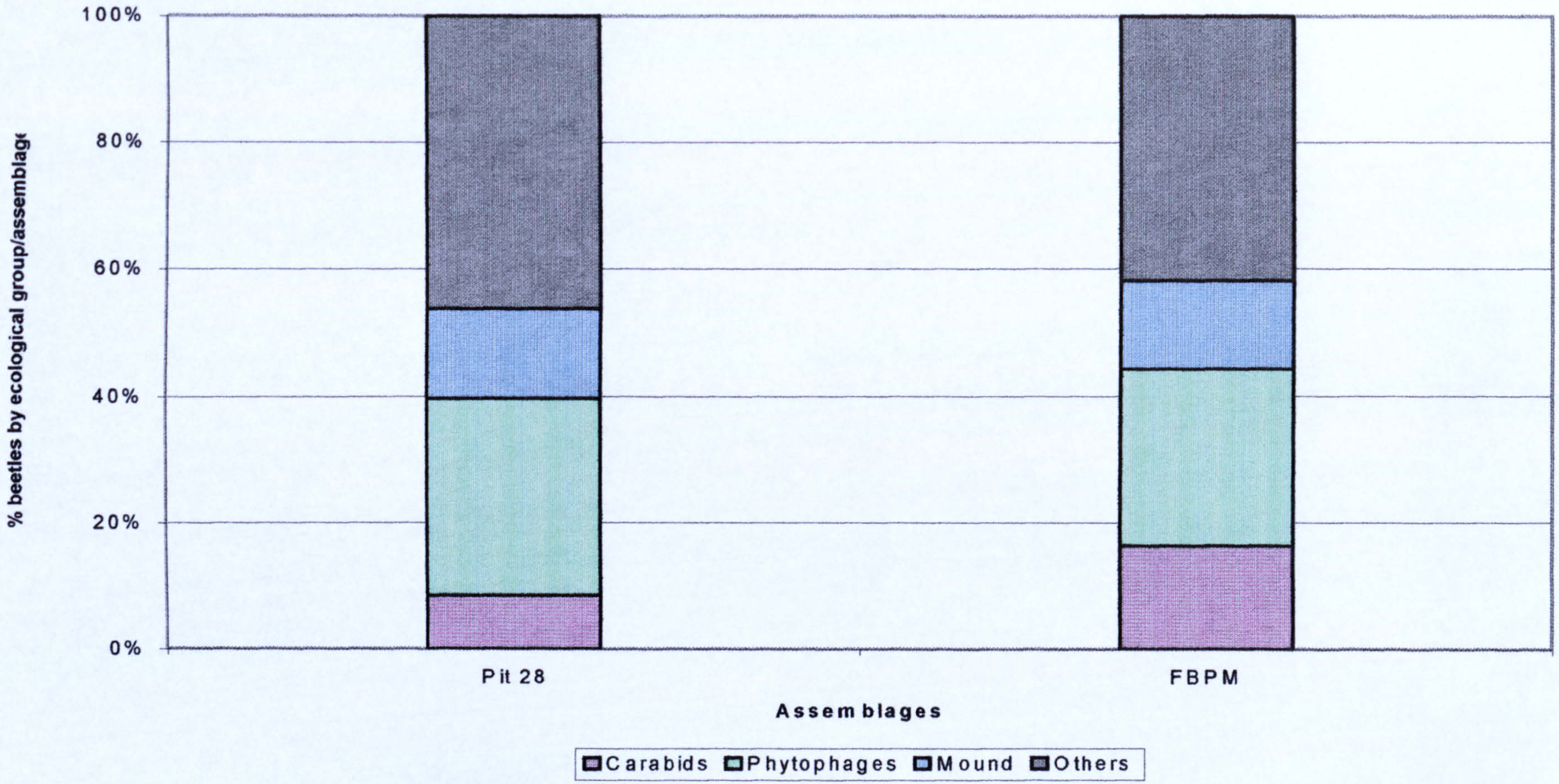

Table 10.1: Fishbourne, sample details

Sample no.	Size in Kg	Depth in m in Pit 28	Comments on samples
1	1	0.50	Grey with Chalk and stones, no insects
2	1	0.60	Dark brown, silty, twigs and leaves, no insects
3	1	0.80	As (2) but more clayey, few fragmentary insects
4	4	1.00	As (3) but with many insects
5	4	1.20 pit base	As (3) but with many insects

Table 10.2: Fishbourne, the Coleoptera from the Saxo-Norman pit
See Section 6.3 and Fig. 6.1 for definition of "eco code" and abbreviations used
See Table 10.1 for sample details

Eco codes	Sample numbers	4	5	Total
	CARABIDAE			
TW C	*Nebria brevicollis* (F.)	2	1	3
GX C	*Notiophilus aquaticus* (L.)		1	1
GD C	*Loricera pilicornis* (F.)	1		1
GD C	*Clivina fossor* (L.)		1	1
GD C	*Dyschirius globosus* (Hbst.)		1	1
UU C	Trechus obtusus/4-striatus		2	2
GX C	*Bembidion lampros* (Hbst.)		2	2
GD C	*Bembidion properans* Steph.		3	3
GD C	*Bembidion biguttatum* (F.)	2		2
GD C	*Bembidion guttula* (F.)	1		1
GD C	*Bembidion iricolor* Bed.	1	1	2
UU C	*Bembidion* sp.		1	1
GX C	*Harpalus* sp.		1	1
GD C	*Pterostichus nigrita* (Payk.)	1		1
GD C	*Pterostichus anthracinus* (Panz.)	1	1	2
GD C	*Pterostichus minor* (Gyll.)		1	1
GD C	*Pterostichus melanarius* (Ill.)	1	1	2
GX C	*Amara* sp.	1		1
GX C	*Licinus depressus* (Payk.)		1	1
GX C	*Dromius notatus* Steph.	1		1
UU	*Dromius* sp.	1		1
	DYTISCIDAE			
AA	*Hydroporus* sp.	1	1	2
AA	*Ilybius* sp.	1	1	2
	HYDRAENIDAE			
	Ochthebius minimus (F.)	3	1	4
AA	*Hydraena testacea* Curt.		2	2
	HYDROPHILIDAE			
AS	Helophorus aquaticus/grandis	2	4	6
AS	*Helophorus brevipalpis* Bed.	4	5	9
UU	*Cercyon* (4 spp.)	4	5	9
DF	*Megasternum obscurum* (Marsh.)	1	1	2
AA	*Hydrobius fuscipes* (L.)	1		1
	SILPHIDAE			
TT	*Silpha atrata* L.	1	1	2
	LEIODIDAE			
DU	*Choleva* sp.		1	1
DU	*Catops nigrita* Er.		1	1
	CLAMBIDAE			
DX	*Calyptomerus dubius* (Marsh.)		1	1
	ORTHOPERIDAE			
DC	*Orthoperus* sp.	2	1	3
	PTILIIDAE			
DX	*Ptenidium* sp.		1	1
	STAPHYLINIDAE			
DF	*Omalium rivulare* (Payk.)	5	1	6
DC	*Omalium caesum* Grav.	3	1	4
DX	*Xylodromus concinnus* (Marsh.)	2	2	4
GD	*Lesteva longoelytrata* Goez.	1	1	2
DF	*Carpelimus bilineatus* Steph.	8	7	15
UU	*Carpelimus* (2 spp.)	7	1	8
DU	*Anotylus rugosus* (F.)	5	2	7
DF	*Anotylus sculpturatus* (Grav.)	7	3	10
DF	*Anotylus nitidulus* (Grav.)		1	1
DC	*Anotylus complanatus* (Er.)	2		2
GD	*Platystethus degener/cornutus* (Grav.)	1	2	3
GD	*Platystethus nitens* (Sahl.)	3	5	8
UU	*Stenus* sp.	1	4	5
DX	*Hypomedon propinquus* (Bris.)		1	1
DX	*Xantholinus linearis* (Ol.)	1		1
DX	*Xantholinus longiventris* Heer	2		2
DU	*Philonthus* (2 spp.)	2	2	4
UU	*Quedius* sp.		2	2
DX	*Tachyporus solutus* Er.		1	1
UU	*Tachyporus hypnorum* (F.)		3	3
UU	*Tachyporus* sp.	1		1
DF	*Tachinus humeralis* Grav.	2		2
DF	*Tachinus marginellus* (F.)	1	1	2
DC	*Tachinus corticinus* Grav.	1		1
DF	*Aleochara* sp.		1	1

Eco codes	Sample numbers	4	5	Total
UU	Aleocharinae gen. indet.	6	5	11
	PSELAPHIDAE			
GD	*Bryaxis* sp.	1		1
GD	*Brachygluta fossulata* (Reich.)		1	1
	NITIDULIDAE			
GA V	*Pria dulcamarae* (Scop.)		1	1
	CRYPTOPHAGIDAE			
DX M	*Cryptophagus* sp.	16	9	25
DX M	*Atomaria* sp	4	5	9
	PHALACRIDAE			
GA V	*Phalacrus corruscus* (Panz.)		1	1
GA V	*Phalacrus* sp.	1		1
	LATHRIDIIDAE			
DX M	*Lathridius minutus* (grp.)	8	4	12
DX M	*Corticarina* spp.	1	3	4
	ANOBIIDAE			
HT	*Anobium punctatum* (Deg.)	4	4	8
	PTINIDAE			
HH M	*Ptinus fur* (L.)		1	1
	SCARABAEIDAE			
DF	*Aphodius prodromus* (Brahm)	1	2	3
GP	*Aphodius sordidus* (F.)		2	2
DF	*Aphodius granarius* (L.)	1	1	2
GP	*Aphodius* sp.	1	1	2
	CHRYSOMELIDAE			
UU V	*Oulema* sp.		1	1
GD V	*Phaedon armoraciae* (L.)		1	1
TW	*Phytodecta viminalis* (L.)		1	1
UU V	*Phyllotreta nemorum* (L.)	16	16	32
UU V	*Phyllotreta undulata* Kuts.	2	2	4
UU V	*Phyllotreta atra* (F.)	1	1	2
UU V	*Longitarsus* spp.	3	3	6
GA V	*Batophila aerata* (Marsh.)	8	10	18
UU V	*Crepidodera ferruginea* (Scop.)		2	2
UU V	*Derocrepis rufipes* (L.)		1	1
TW V	*Chalcoides fulvicornis* (F.)	1	2	3
GA V	*Chaetocnema concinna* (Marsh.)	1	3	4
GA V	*Chaetocnema hortensis* (Fourc.)		1	1
	BRUCHIDAE			
FL V	*Bruchus loti* Payk.	1	2	3
FL	*Bruchus rufimanus* Bohe.	1	3	4
	SCOLYTIDAE			
TW	*Scolytus rugulosus* (Müll.)		1	1
	APIONIDAE			
UU V	*Apion* spp.	1	5	6
	CURCULIONIDAE			
UU V	*Barypeithes araneiformis* (Schr.)	1	1	2
GX V	*Sitona striatellus* Gyll.		1	1
GA V	*Sitona lineatus* (L.)	2	1	3
GA V	*Sitona waterhousei* Walt.		1	1
UU V	*Sitona* sp.		1	1
TW	*Dorytomus ?tortrix* (L.)	1		1
GD V	*Notaris acridulus* (L.)	2	2	4
UU V	*Tychius* sp.	1	1	2
TW	*Curculio salicivorus* Payk.		1	1
GD V	*Amalorrhynchus melanarius* (Steph.)		1	1
UU V	*Ceutorhynchus* (2 spp.)	3	2	5

Table 10.3: Fishbourne, Saxo-Norman pit assemblage in rank order

Total assemblage Pit 28	**MNI**
Phyllotreta nemorum (L.)	32
Cryptophagus sp.	25
Batophila aerata (Marsh.)	18
Carpelimus bilineatus Steph.	15
Lathridius minutus group.	12
Aleocharinae gen. indet.	11
Anotylus sculpturatus (Grav.)	10
Helophorus brevipalpis Bed.	9
Atomaria sp	9
Cercyon (3) spp.	9
Carpelimus sp.	8
Platystethus nitens (Sahl.)	8
Anobium punctatum (Deg.)	8
Anotylus rugosus (F.)	7
Helophorus aquaticus/grandis	6
Omalium rivulare (Payk.)	6
Longitarsus (3) spp.	6
Apion (5) spp.	6
Stenus sp.	5
Ceutorhynchus (2) spp.	5
Ochthebius minimus (F.)	4
Omalium caesum Grav.	4
Xylodromus concinnus (Marsh.)	4
Phyllotreta undulata Kuts.	4
Chaetocnema concinna (Marsh.)	4
Bruchus ?rufimanus Bohe.	4
Notaris acridulus (L.)	4
Philonthus (2) spp.	4
Corticarina (3) spp.	4
Nebria brevicollis (F.)	3
Bembidion properans Steph.	3
Orthoperus sp.	3
Platystethus cornutus (Grav.)	3
Tachyporus hypnorum (F.)	3
Aphodius prodromus (Brahm)	3
Chalcoides fulvicornis (F.)	3
Bruchus loti Payk.	3
Sitona lineatus (L.)	3
Trechus obtusus /4- striatus	2
Bembidion lampros (Hbst.)	2
Bembidion biguttatum (F.)	2
Bembidion iricolor Bed.	2
Pterostichus anthracinus (Panz.)	2
Pterostichus melanarius (Ill.)	2
Hydroporus sp.	2
Ilybius sp.	2
Hydraena testacea	2
Megastermum obscurum (Marsh.)	2
Silpha atrata L.	2
Lesteva longoelytrata Goez.	2
Anotylus complanatus (Er.)	2
Xantholinus longiventris Heer	2
Quedius sp.	2

Tachinus humeralis Grav.	2
Tachinus marginellus (F.)	2
Aphodius sordidus (F.)	2
Aphodius granarius (L.)	2
Aphodius sp.	2
Phyllotreta atra (F.)	2
Crepidodera ferruginea (Scop.)	2
Barypeithes araneiformis (Schr.)	2
Tychius sp.	2
Notiophilus aquaticus (L.)	1
Loricera pilicornis (F.)	1
Clivina fossor (L.)	1
Dyschirius globosus (Hbst.)	1
Bembidion guttula (F.)	1
Bembidion sp.	1
Harpalus sp.	1
Pterostichus nigrita (Payk.)	1
Pterostichus minor (Gyll.)	1
Amara sp.	1
Licinus depressus (Payk.)	1
Dromius notatus Steph.	1
Dromius sp.	1
Hydrobius fuscipes (L.)	1
Choleva sp.	1
Catops nigrita Er.	1
Calyptomerus dubius (Marsh.)	1
Ptenidium sp.	1
Anotylus nitidulus (Grav.)	1
Hypomedon propinquus (Bris.)	1
Xantholinus linearis (Ol.)	1
Tachyporus solutus Er.	1
Tachyporus sp.	1
Tachinus corticinus Grav.	1
Aleochara sp.	1
Bryaxis sp.	1
Brachygluta fossulata (Reich.)	1
Pria dulcamarae (Scop.)	1
Phalacrus corruscus (Panz.)	1
Phalacrus sp.	1
Ptinus fur (L.)	1
Oulema sp.	1
Phaedon armoraciae (L.)	1
Phytodecta viminalis (L.)	1
Derocrepis rufipes (L.)	1
Chaetocnema hortensis (Fourc.)	1
Scolytus rugulosus (Müll.)	1
Sitona striatellus Gyll.	1
Sitona waterhousei Walt.	1
Sitona sp.	1
Dorytomus tortrix (L.)	1
Curculio salicivorus Payk.	1
Amalorrhynchus melanarius (Steph.)	1
Total MNI	369
Total MNS	120

Table 10.4: Fishbourne. The Coleoptera from the stream sediment at Fishbourne Roman Palace Meadows

Eco code		Sample position	Up-stream	Down stream
		CARABIDAE		
TW	C	*Nebria brevicollis* (F.)	1	
TW	C	*Notiophilus palustris* (Duft.)	1	
UU	C	*Trechus obtusus/4-striatus*	2	
GD	C	*Bembidion (Ocys) harpaloides* Serv.	1	
GD	C	*Bembidion guttula* (F.)	1	
UU	C	*Bembidion* sp		1
HH	C	*Laemostenus terricola* (Hbst.)	1	
		HALIPLIDAE		
AA		*Haliplus* sp.		1
		DYTISCIDAE		
AA		*Agabus* sp.		1
		HYDROPHILIDAE		
DC		*Cercyon analis* (Payk.)		1
AS		*Helophorus* sp.	1	1
AA		*Anacaena limbata* (F.)	1	
		ORTHOPERIDAE		
DC		*Orthoperus* sp.	1	
		PTILIIDAE		
DX	M	Spp. Indet. sp.	2	
		STAPHYLINIDAE		
DC		*Metopsia retusa* (Steph.)	1	
DU		*Proteinus ovalis* Steph.	1	
UU		*Stenus* sp.	1	
UU		*Phyllodrepa* sp.	1	
DU		*Omalium* sp.		1
UU		*Carpelimus* sp.	1	
DF		*Anotylus tetracarinatus* Block		1
DX		*Xantholinus linearis* (Ol.)	2	
DU		*Philonthus* sp.	1	
DU		*Ocypus olens* Müll.	1	
DC		*Tachyporus hypnorum* (F.)	1	
DC		*Tachyporus nitidulus* (F.)		1
UU		*Aleocharinae* gen. indet.	1	1
		CRYPTOPHAGIDAE		
DX	M	*Cryptophagus* sp.	1	
DX	M	*Atomaria* sp	2	

Eco code		Sample position	Up-stream	Down stream
		LATHRIDIIDAE		
DX	M	*Corticaria* sp.	1	1
		SCRAPTIIDAE		
TW		*Anaspis humeralis* (F.)	1	
		SCARABAEIDAE		
DF		*Aphodius* granarius (L.)	1	
GP		*Aphodius* sp.	1	
		CHRYSOMELIDAE		
UU	V	*Phyllotreta nigrita*	1	
GA	V	*Aphthona euphorbiae* (Schr.)	2	
GA	V	*Longitarsus jacobaeae* (Water.)	2	
GA	V	*Longitarsus parvulus*	1	
		(Payk.)/*pratensis* (Panz.)		
UU	V	*Longitarsus* spp.	1	
GA	V	*Batophila aerata* (Marsh.)	1	1
GA	V	*Chaetocnema concinna* (Marsh.)	1	
		CURCULIONIDAE		
UU	V	*Phyllobius* sp.		1
UU	V	*Barypeithes pellucidus* (Bohe.)	1	1
GA	V	*Sitona lineatus* (L.)	1	
GA	V	*Sitona hispidulus* (F.)	1	
GA	V	*Sitona suturalis* Steph.		1
HT		*Euophryum confine* (Broun)	1	1
GA	V	*Ceutorhynchus pallidactylus* Marsh.	1	
		MNI	44	15
		MNS	38	15

Table 10.5: Fishbourne. Ancient and modern beetles with their host plants

Saxo/Norman beetles	**Modern beetles**	**Fishbourne flora**
		Marshland species
	Altica oleracea	Willowherb *(Epilobium hirsutum)*
Amalorrhynchus melanarius		Watercress *(Rorippa spp.)*
Chalcoides fulvicornis		Willow, *(Salix)*
Curculio salicivorus		Willow, *(Salix)*
Notaris acridulus		Aquatic grasses *e.g (Glyceria ssp)*
Phaedon armoraciae	*Prasiocuris junci*	Brooklime *(Veronica beccabungae)*
Phytodecta viminalis		Willow, *(Salix)*
Pria dulcamarea		Bittersweet, (*Solanum dulcamara*)
		Grassland species
Apion spp	*Apion* spp.	e.g. Clovers, vetches
Bruchus loti		Birdsfoot trefoil *(Lotus corniculatus) and* Meadow pea *(Lathyrus pratensis)*
Bruchus rufimanus		Meadowsweet (*Filopendula ulmaria)*
Chaetocnema concinna	*Chaetocnema concinna*	*e.g.* Dock *Rumex, Polygonum*
Chaetocnema hortensis		*e.g.* Dock *Rumex, Polygonum*
Crepidodera ferruginea		Cereals and thistles
Derocrepis rufipes		Leguminosae
Oulema sp.		Grasses
Phalacrus corruscus		Cereals and grasses
Sitona lineatus	*Sitona lineatus, S. hispidulus, S. suturalis*	Leguminosae
Sitona waterhousei		Bird's foot trefoils;*(Lotus corniculatus, L. uliginosus)*
		General
Barypeithes araneiformis	*Barypeithes pellucida*	Various
Batophila aerata	*Batophila aerata*	Brambles *(Rubus* spp.)
Scolytus rugulosus		Trees, esp. fruit
		Not found now
Phyllotreta atra	*Phyllotreta nigripes*	Cabbage spp *(Brassicas)*
Phyllotreta nemorum	*Phyllotreta cruciferae*	Cabbage spp *(Brassicas)*
Phyllotreta undulata		Cabbage spp *(Brassicas)*
Sitona striatellus		Gorse *(Ulex)*, Broom *(Cytisus)*

Fig. 11.1: Map of Chichester showing the location of the site described in Chapter 11.

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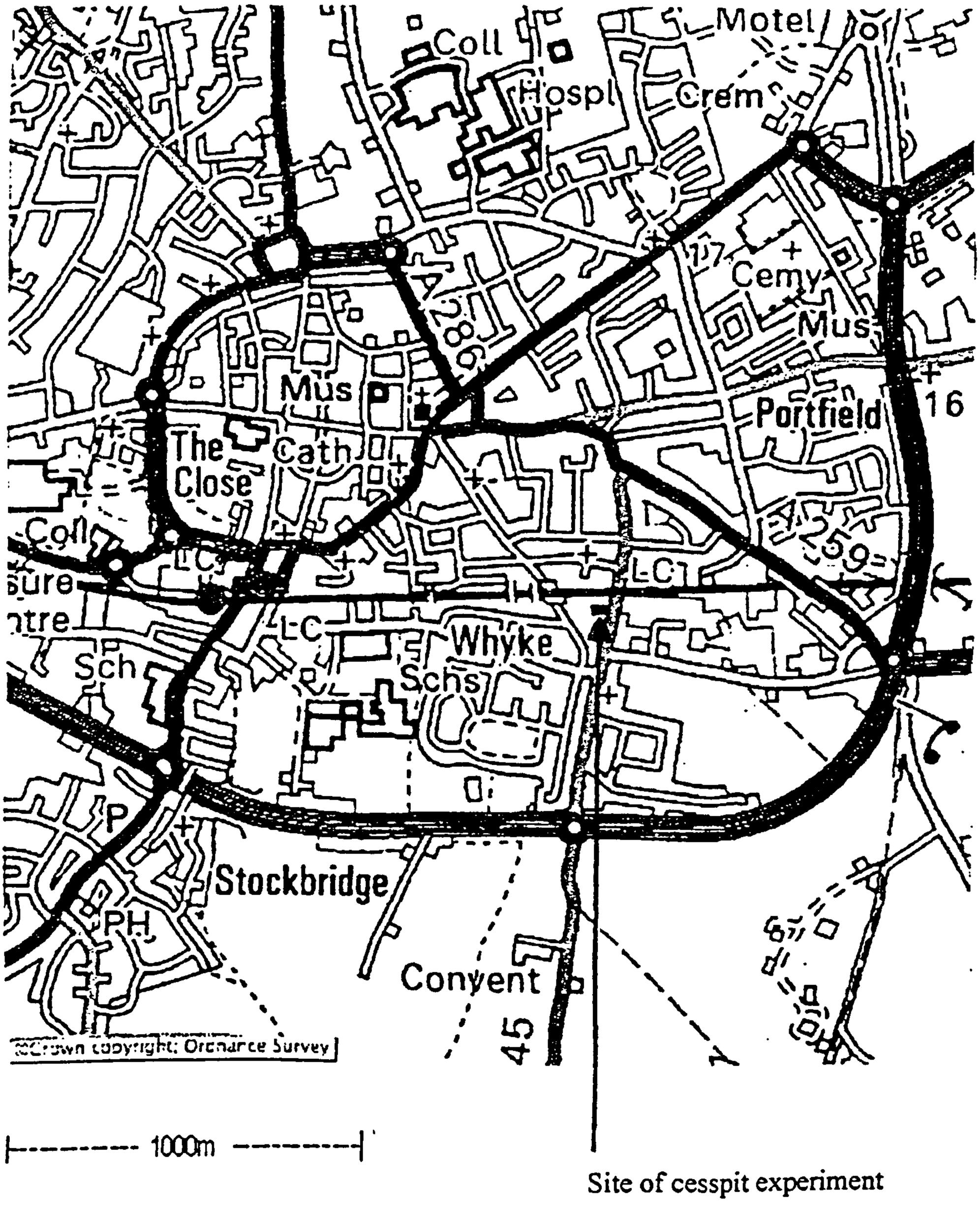


Site of cesspit experiment

Fig. 11.2: Chichester. Plan of garden showing position of the experimental and control pits

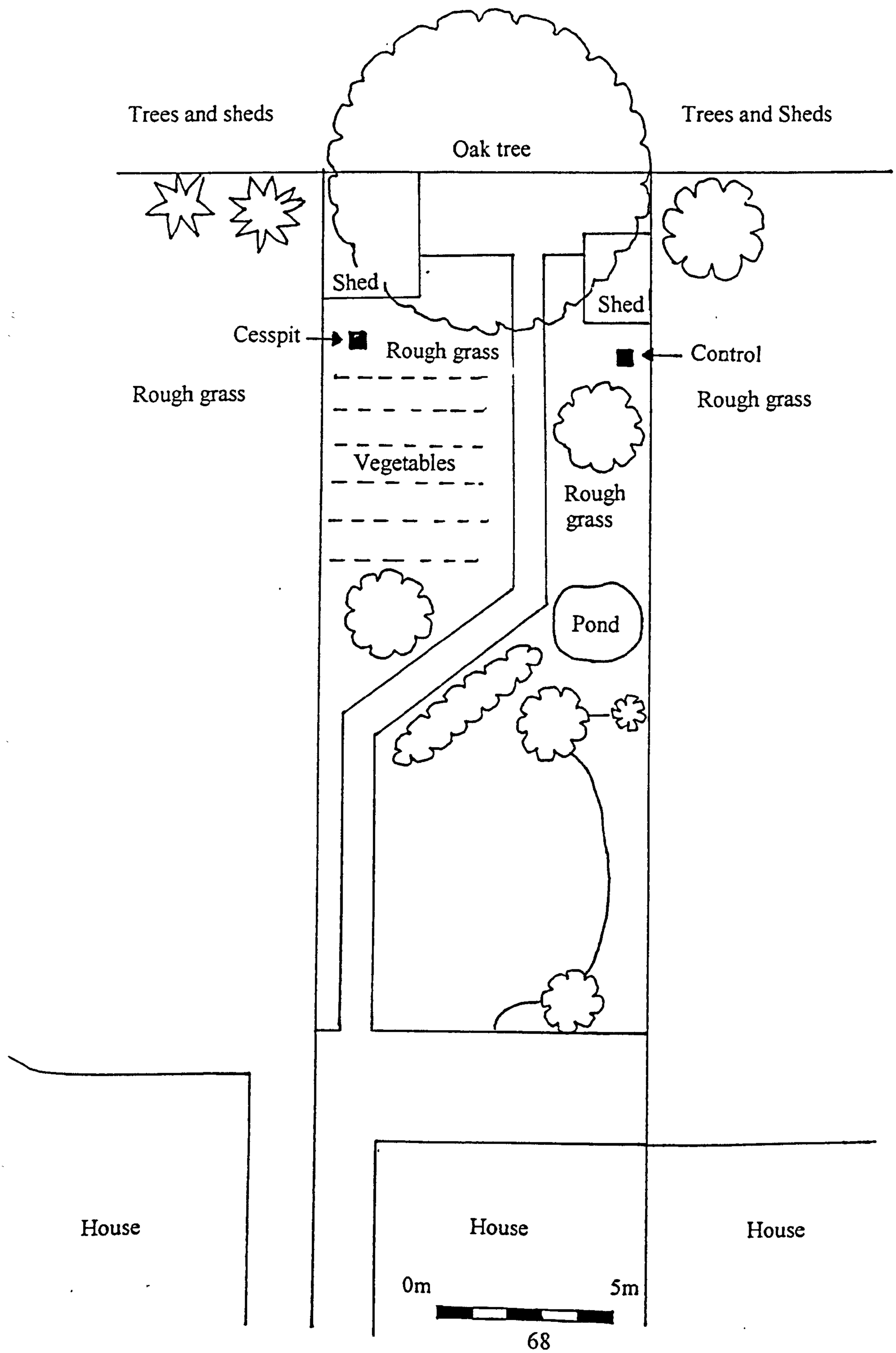


Fig. 11.3: Chichester, Experimental cesspit.
Chart comparing the habitats represented by the assemblages from the cesspit with those from the control pit.
For key see Fig. 6.1

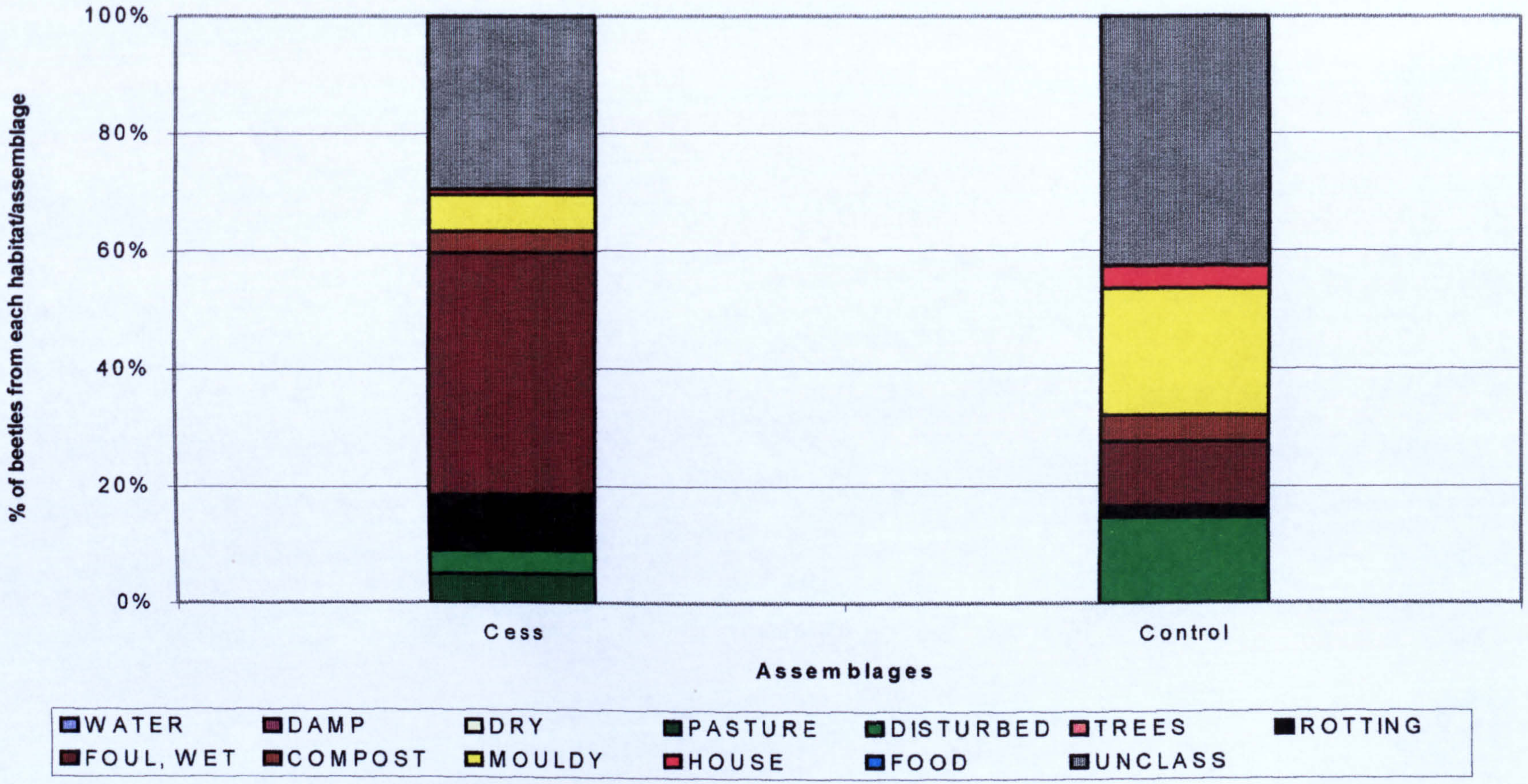


Fig. 11.4: Chichester, Experimental cesspit.
Proportions of different ecological groups represented in the assemblages from experimental cesspit and the control pit.

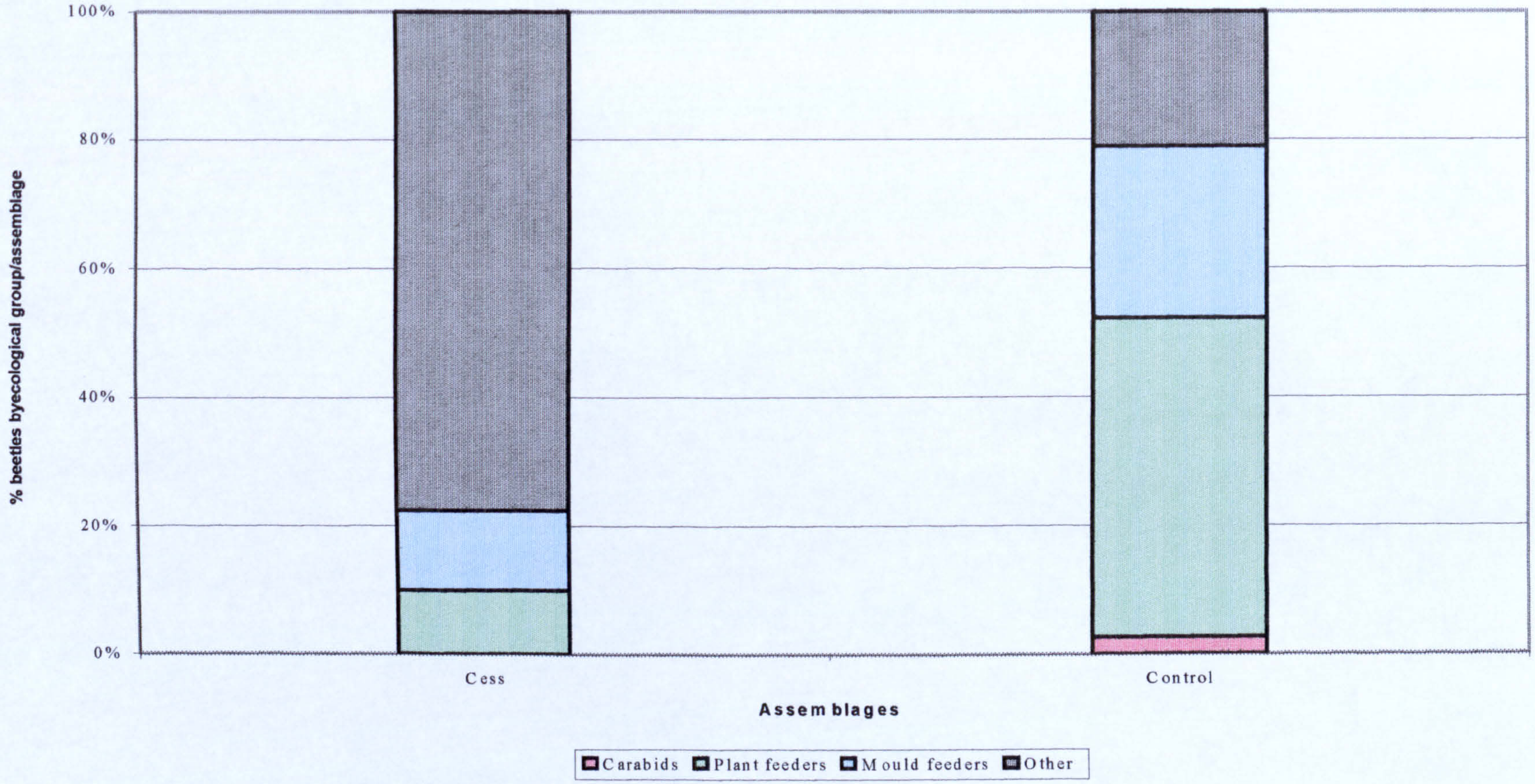


Table 11.1: The Coleoptera from an experimental cesspit and control pit
See Section 6.3 and Fig. 6.1 for definition of "eco code" and abbreviations used

Eco codes		Sample numbers	2C	3C	4C	Total cess	2W	3W	4W	Total control
		CARABIDAE								
GA	C	*Harpalus rufibarbis* (F.)					1	1	1	3
UU	C	*Badister bipustulatus* (F.)						1		1
		HYDROPHILIDAE								
DF		*Sphaeridium scarabaeoides* (L.)		2		2				
DF		*Cercyon haemorrhoidalis* (F.)	4	3	2	9				
DU		*Megasternum obscurum* (Marsh	2	2	5	9		2		2
DF		*Cryptopleurum minutum* (F.)	1			1				
		HISTERIDAE								
DF		*Saprinus semistriatus* (Scrib)		1	1	2				
DF		*Hister impressus* F.		2		2				
		CATOPIDAE								
DX		*Ptomaphagus* sp.	1		1	2				
		ORTHOPERIDAE								
DC		*Orthoperus* sp.	1			1				
		PTILIIDAE								
DX	M	*Ptenidium* sp.		2		2				
DX	M	*Acrotrichis* sp.		2		2				
		STAPHYLINIDAE								
DU		*Megarthrus depressus* (Payk.)	2	5	3	10				
DF		*Anotylus sculpturatus* (Grav.)	4	4	4	12		2		2
DF		*Anotylus inustus* Grav.			1	1				
DF		*Anotylus complanatus* (Er.)	4	4	8	16		3		3
DF		*Anotylus tetracarinatus* Block	306	308	223	837		9		9
DF		*Oxytelus sculptus* Grav.			1	1		1		1
DF		*Gyrohypnus fracticornis* (Moll.)	1	2	1	4				
DU		*Gyrohypnus* sp.						1		1
DC		*Neobisnius procerulus* Er.		1	2	3				
DF		*Philonthus succicola* Thom.		1	1	2			1	1
DU		*Philonthus* (3 spp.)	1	3	2	6				
DU		*Quedius mesomelinus* (Marsh.)		2		2				
UU		*Quedius* sp.						1		1
DC		*Tachyporus chryso/dispar*						1		1
UU		*Tachyporus* sp.						1		1
DF		*Tachinus marginellus* (F.)	2		1	3				
DF		*Tachinus signatus* Grav.			2	2				
DF		*Tachinus proximus* Kr.			1	1				
DF		*Autalia rivularis* (Grav.)		2	1	3				
DF		*Aleochara bipustulata* Gyll			4	4				
DF		*Aleochara* (3 spp.)	1	2	8	11				
UU		Aleocharinae gen. indet.(5) spp.	13	15	19	47		6		6
		DERMESTIDAE								
DX		*Anthrenus fuscus* Ol.						1		1
		BYTURIDAE								
GA	V	*Byturus ochraceus* (Scrib.)			1	1	1	1		2
		NITIDULIDAE								
UU	V	*Meligethes* sp.						1		1
DX		*Omosita discoidea* (F.)						1		1
		CUCUJIDAE								
DX	M	*Monotoma brevicollis* Aube			1	1				
		CRYPTOPHAGIDAE								
DX	M	*Cryptophagus* sp.						2		2
DF	M	*Atomaria ruficornis* (Marsh.)	1	3	12	16		6	4	10
DC		*Ephistemus globulus* (Payk.)			4	4		4	2	6
		LATHRIDIIDAE								
DX	M	*Aridius bifasciatus* (Reitt.)		1	4	5		10	2	12
DX	M	*Aridius nodifer* (West.)			1	1		7	1	8
DX	M	*Enicmus transversus* (Ol.)					1	8	1	10
DX	M	*Corticaria* sp.		1		1				
		COCCINELLIDAE								
GA	V	*Adonia variegata* (Goez.)						1		1
		ANOBIIDAE								
HT		*Anobium punctatum* (Deg.)						2		2
		SCARABAEIDAE								
GP		*Onthophagus coenobita* (Hbst.)	4	2	2	8				
GP		*Aphodius fimetarius* (L.)		1		1				
GP		*Aphodius rufus* (Moll	1	1		2				
		CHRYSOMELIDAE								
UU	V	*Phyllotreta flexuosa* (Ill.)		1		1				

Eco codes		Sample numbers	2C	3C	4C	Total cess	2W	3W	4W	Total control
UU	V	*Phyllotreta exclamationis* (Thun)							1	1
UU	V	*Phyllotreta cruciferae* (Goez.)			4	4		5	13	18
GA	V	*Longitarsus ?parvulus* (Payk.)		2	4	6	1	7	5	13
UU	V	*Longitarsus* spp.						2		2
GA	V	*Chaetocnema hortensis* (Fourc.)						1		1
GA	V	*Psylliodes chrysocephala* (L.						1		1
		CURCULIONIDAE								
UU	V	*Apion* sp.						1		1
UU	V	*Barypeithes araneiformis* (Schr.)						2		2
UU	V	*Barypeithes pellucidus* (Bohe.)	2	4	2	8	7	18	6	31
GA	V	*Sitona lineatus* (L.)		1		1		1		1
GA	V	*Sitona puncticollis* Steph		1		1				
UU	V	*Sitona* sp.						1		1
HT		*Euophryum confine* (Broun).	1	1		2	1	3		4
UU	V	*Ceutorhynchus* sp.						1	1	2

Table 11.2: Assemblages from modern cesspit and control pit in rank order

Total cesspit assemblage	**MNI**
Anotylus tetracarinatus Block	837
Aleocharinae gen. indet.(5) spp.	47
Anotylus complanatus (Er.)	16
Atomaria ruficornis (Marsh.)	16
Anotylus sculpturatus (Grav.)	12
Aleochara (3) spp.	11
Megarthrus depressus (Payk.)	10
Cercyon haemorrhoidalis (F.)	9
Megasternum obscurum (Marsh	9
Onthophagus coenobita (Hbst.)	8
Barypeithes pellucidus (Bohe.)	8
Philonthus (3) spp.	6
Longitarsus pratensis (Panz.)	6
Aridius bifasciatus (Reitt.)	5
Gyrohypnus fracticornis (Moll.)	4
Aleochara bipustulata Gyll	4
Ephistemus globulus (Payk.)	4
Phyllotreta cruciferae (Goez.)	4
Neobisnius procerulus Er.	3
Tachinus marginellus (F.)	3
Autalia rivularis (Grav.)	3
Sphaeridium scarabaeoides (L.)	2
Saprinus semistriatus (Scrib)	2
Hister impressus F.	2
Ptomaphagus sp.	2
Ptenidium sp.	2
Acrotrichis sp.	2
Philonthus succicola Thom.	2
Quedius mesomelinus (Marsh.)	2
Tachinus signatus Grav.	2
Aphodius rufus (Moll	2
Euophryum confine Broun	2
Cryptopleurum minutum (F.)	1
Orthoperus sp.	1
Anotylus inustus Grav.	1
Oxytelus sculptus Grav.	1
Tachinus proximus Kr.	1
Byturus ochraceus (Scrib.)	1
Monotoma brevicollis Aube	1
Aridius nodifer (West.)	1
Corticaria sp.	1
Aphodius fimetarius (L.)	1
Phyllotreta flexuosa (Ill.)	1
Sitona lineatus (L.)	1
Sitona puncticollis Steph.	1
Total MNI	1060
Total minus *A. tetracarinatus*	223
Total MNS	51

Total control assemblage	**MNI**
Barypeithes pellucidus (Bohe.)	31
Phyllotreta cruciferae (Goez.)	18
Longitarsus pratensis (Panz.)	13
Aridius bifasciatus (Reitt.)	12
Atomaria ruficornis (Marsh.)	10
Enicmus transversus (Ol.)	10
Anotylus tetracarinatus Block	9
Aridius nodifer (West.)	8
Aleocharinae gen. indet.(5) spp.	6
Ephistemus globulus (Payk.)	6
Euophryum confine Broun.	4
Harpalus rufibarbis (F.)	3
Anotylus complanatus (Er.)	3
Megasternum obscurum (Marsh	2
Anotylus sculpturatus (Grav.)	2
Byturus ochraceus (Scrib.)	2
Cryptophagus sp.	2
Anobium punctatum (Deg.)	2
Longitarsus spp.	2
Barypeithes araneiformis (Schr.)	2
Ceutorhynchus sp.	2
Badister bipustulatus (F.)	1
Oxytelus sculptus Grav.	1
Gyrohypnus sp.	1
Philonthus succicola Thom.	1
Quedius sp.	1
Tachyporus chryso/dispar	1
Tachyporus sp.	1
Anthrenus fuscus Ol.	1
Meligethes sp.	1
Omosita discoidea (F.)	1
Adonia variegata (Goez.)	1
Phyllotreta exclamationis (Thun)	1
Chaetocnema hortensis (Fourc.)	1
Psylliodes chrysocephala (L.	1
Apion sp.	1
Sitona lineatus (L.)	1
Sitona sp.	1
Total MNI	166
Total minus *A. tetracarinatus*	157
Total MNS	41

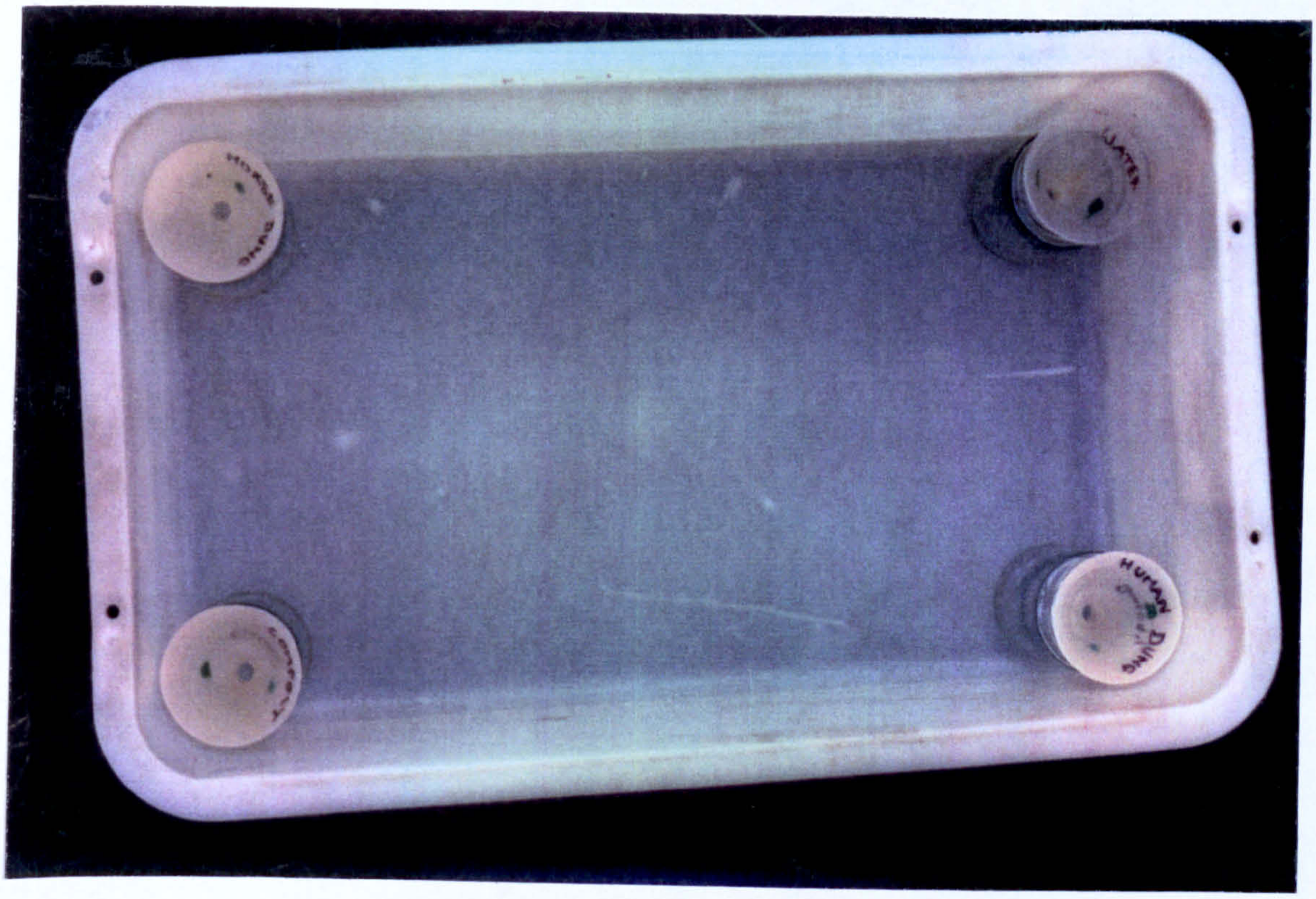
Plate 11.1: Chichester. Illustrations of the cesspit experiment

A: The cesspit, after digging

B: The cesspit, covered over

Plate 11.2: Chichester. Illustrations of the choice chamber experiment

A: The choice chamber set up.



B: The choice chamber in use

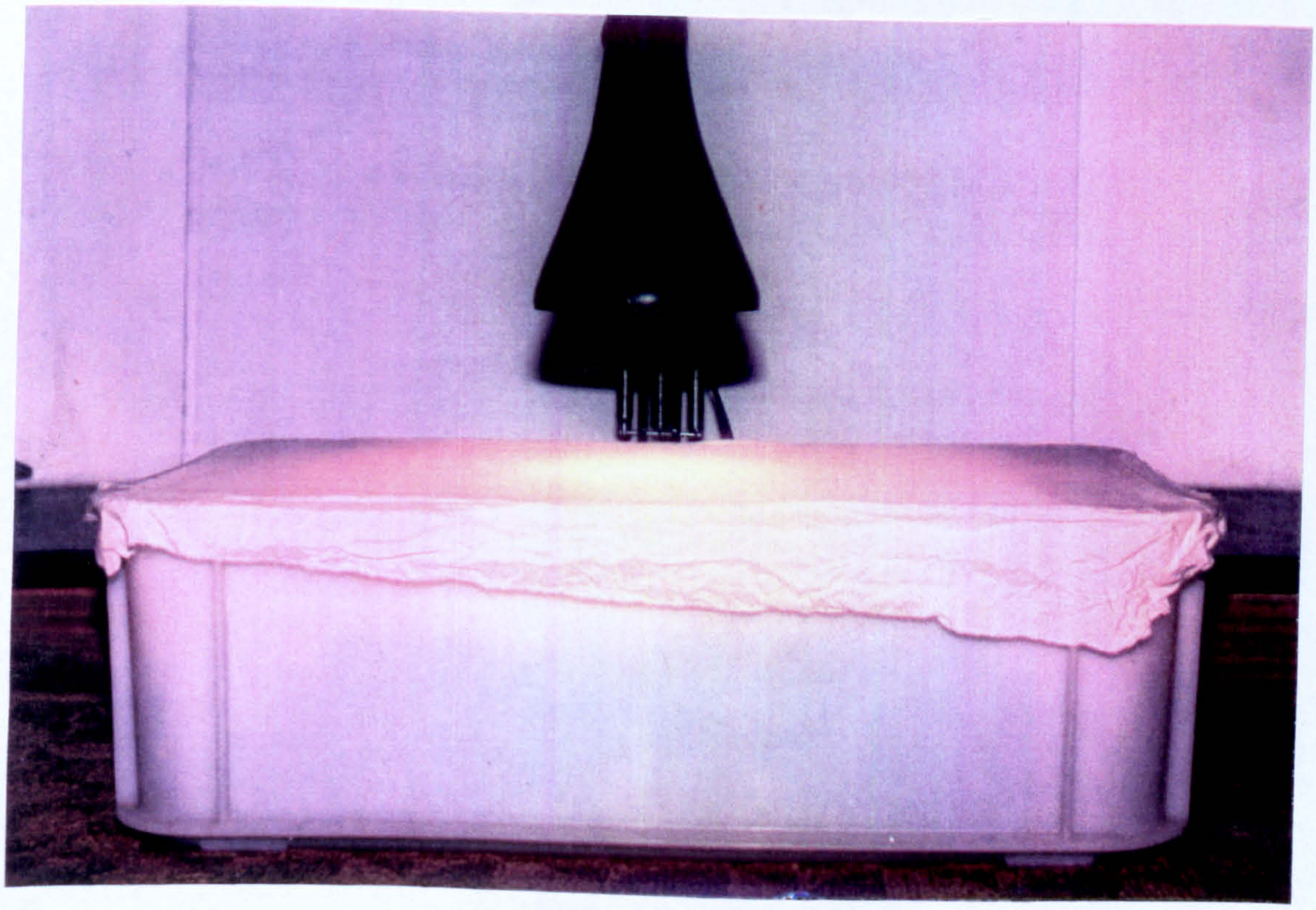


Table 12.1: Distribution of selected "house" species in archaeological assemblages in Britain from the Roman to the post-medieval period, arranged in chronological order. See below for key to abbreviations used.

Age	Location	Author and date		FT	SA	House species			
						Tu	Pf	Mh	Ab
1	Dragonby, N. Lincs.	Buckland	1996	W	R				
1	London-Copthall Ave	Moulins, D. de	1990	7D	U +		+		+
1	Carlisle-OGLB, Cum & West.	Kenward *et al.*	1992c	B	U		+		
1	Carlisle-OGLA, Cum & West.	Kenward *et al.*	1992b	4B	U		+		+
1	Carlisle-OGLA, Cum & West.	Kenward *et al.*	1992b	7M	U		+		+
1	Carlisle-OGLA, Cum & West.	Kenward *et al.*	1992b	4P	U		Sp.		
1	Alcester, Warks.	Osborne	1971b	P	U		Sp.		
1	Carlisle-OGLB, Cum & West.	Kenward *et al.*	1992c	2M	U		+		
1	Carlisle-OGLA, Cum & West.	Kenward *et al.*	1992b	4D	U		Sp.		+
1-2	Papcastle, Cumb.	Kenward & Allison	1988	U	F		+Sp.		
1-2	Kirkham, Lancs.	Carrott *et al.*	1995a	2D	F				+
1-2	Exeter, Devon	Straker *et al.*	1984	2D	F		+		
1-2	Winchester, The Brooks.	Grove this vol.		D	U +		+		+
1-2	York-Coney St.	Kenward & Williams	1976	B	U		+		+
1-2	Carlisle-LELA, Cum & West.	Kenward *et al.*	1992a	5M	U		+		
1-3	Alchester, Oxon.	Giorgi & Robinson	1985	D	U		+		
2	York-Church St.	Buckland	1976b	D	F +		Sp. +		+
2	London-Southwark	Girling	1979	P	U		+		
2	Carlisle-OGLB, Cum & West.	Kenward *et al.*	1992c	W	U		+		
2	Carlisle-LELA, Cum & West.	Kenward *et al.*	1992a	P	U +		Sp.		
2	York-Rougier St.	Hall & Kenward	1990	D	U +		?		
2	York-Tanner Row	Hall & Kenward	1990	D	U ?		+		
2	York-Tanner Row	Hall & Kenward	1990	2B	U +		+		+
2	York-Tanner Row	Hall & Kenward	1990	D	U +		+		
2	York-Tanner Row	Hall & Kenward	1990	2P	U +		+	+	
2	York-Tanner Row	Hall & Kenward	1990	2B	U +		+	+	+
2	York-Tanner Row	Hall & Kenward	1990	M	U +				+
2-3	York-Bedern	Kenward *et al.*	1986	P	F +		+		+
2-3	London-Copthall Ave	Moulins, D. de	1990	D	U +		+		
2-3	London-Copthall Ave	Moulins, D. de	1990	B	U		?		+
2-3	York-Skeldergate	Hall *et al.*	1988	P	U D		+Sp.	+	+
2-3	York-Tanner Row	Hall & Kenward	1990	B	U +		+	+	
2-3	Carlisle-OGLA, Cum & West.	Kenward *et al.*	1992b	2M	U		Sp.		+
3	Kirkham, Lancs.	Carrott *et al.*	1995a	2D	F				
3	Dalton Parlours, W. Yorks.	Sudell	1990	W	R +		+Sp.		
3	Empingham, Rutland	Buckland	1986	W	R +		D		
3	Lincoln	Carrott *et al.*	1995c	5M	U +		Sp.		+
3	York-Tanner Row	Hall & Kenward	1990	P	U +				+
3-4	Farmoor, Oxon.	Robinson	1979	2D	R		+		
3-4	Farmoor, Oxon.	Robinson	1979	4W	R +		D		
4	Sandtoft, Yorks	Samuels & Buckland	1978	D	F +				
4	Appleford, Oxon.	Robinson	1981a	2W	R		+	+	
4	Bancroft, Bucks.	Pearson & Robinson	1994	D	R		+		
4	Barnsley Park, Glos.	Coope & Osborne	1968	W	R +				

Age	Location	Author and date		F.T	S A	House species			
						Tu	Pf	Mh	Ab
4	Lincoln	Carrott *et al.*	1995c	6M	U	+	+	+	+
4	Towcester, Northants.	Girling	1983	2D	U		+	+	+
4	London-Copthall Ave	Moulins, D. de	1990	4D	U		+		
4	Chichester-Market, W.Sx.	Girling	1989	W	U	+	+		+
5	York-Tanner Row	Hall & Kenward	1990	2P	U		+	?	
08	York-Bedern	Kenward *et al.*	1986	2P	R		+	+	
08	N. Ireland	Kenward & Allison	1994	2B	R	+	Sp.?	+	+
08	Southampton-Glanville St	Buckland *et al.*	1976	P	U				
09	York-Lloyd's Bank	Buckland	1974	P	U				+
09	York-5/7 Coppergate	Hall *et al.*	1983b	83M	U		+	+	+
09	York-Lloyds Bank	Hall *et al.*	1983b	83B	U		+	+	+
09-10	Southampton, L. High St.	Grove this vol.		P	U		+		
09-10	York-Coppergate	Kenward & Hall	1995	50P	U		+	+	+
09-10	Winchester-The Brooks	Grove this vol.		2P	U		+	+	
09-10	York-Coppergate	Kenward & Hall	1995	24M	U		+	+	+
10	Lincoln	Carrott *et al.*	1995c	2M	U		+	+	+
10	York-Coppergate	Kenward & Hall	1995	52B	U		+	+	+
10	York-Coppergate	Kenward & Hall	1995	37P	U		+	+	+
10-11	Winchester-The Brooks	Carrott *et al.*	1996	P	U		+	D	
10-11	Norwich-Fishergate	Allison & Kenward	1994	U	U		+		
10-11	York-Coppergate	Kenward & Hall	1995	22B	U		+	+	+
10-11	York-Coppergate	Kenward & Hall	1995	60P	U		+Sp.	+	+
10-11	Lincoln	Carrott *et al.*	1995c	3P	U		+	+	+
10-11	Winchester-L.B.St.	Osborne	Unpub	5P	U		+	D	+
11	Fishbourne, W. Sx	Grove this vol.		W	R		+		
11	Beverley-Highgate, Yorks	Hall & Kenward	1980	M	U		?Sp.	+	+
11	Winchester-The Brooks.	Grove this vol.		P	U	+	+	+	+
11	Durham	Kenward	1979a	3M	U		?Sp.	+	+
11	Dublin, Ireland	Coope	1981	P	U		+	+	+
11	Dublin, Ireland	Coope	1981	B	U		+	D	+
11	Durham	Kenward	1979a	D	U				+
11-12	London-Copthall Ave	Moulins, D. de	1990	6M	U		+		
11-12	York-Tanner Row	Hall & Kenward	1990	P	U		+	+	+
12	Taunton, Devon	Osborne	1984	P	U	+	+		
12	Oxford-Denny Abbey	Robinson	1980	P	U	D			
12-13	Hen Domen, Mont.	Greig *et al.*	1982	P	F	?	?	D	
12-13	Hereford	Girling	1985	M	U	+			
12-13	Lincoln	Carrott *et al.*	1995c	P	U		Sp.		
12-13	Carlisle-OGLA, Cum & West.	Kenward *et al.*	1992b	W	U	D	Sp.	+	+
12-14	Beverley-Priory, Yorks	Allison *et al.*	1996	3P	U	+	+	+	+
13	Oxford-Hamel	Robinson	1981c	3D	R	+	+	+	
13	York-Tanner Row	Hall & Kenward	1990	3P	U	+	+	+	+
13	Oxford-Hamel	Robinson	1981c	2P	U	+	+	+	
13	York-Bedern, Area II	Hall *et al.*	1993a	P	U	+			+
13	York-Bedern, Area IV	Hall *et al.*	1993b	P	U	+	+		+
13	Leicester	Girling	1981b	D	U	+	Sp.	D	+
13-14	Hull-Chapel Lane	Kenward	1979c	D	U	+		+	+
13-15	Womerley, N.Yorks	Wagner and Pelling	1995	D	R		+	+	

Age	Location	Author and date		F T	S A	House species			
						Tu	Pf	Mh	Ab
13-16	Drum Castle, Aber.	Kenward *et al.*	1995	3B	F	D	Sp.	+	
14	Cowick, S. Humb.	Girling and Robinson	1989	D	R	D	+	D	
14	Winchester-The Brooks	Grove this vol.		P	U	+	+	D	
14	Winchester-The Brooks	Grove this vol.		P	U	D	+	+	
14	Hull-Mytongate	Miller *et al.*	1993	P	U	+	+	+	
14	York-Bedern, Area II	Hall *et al.*	1993a	P	U	D	+	+	+
14	Winchester-The Brooks	Carrott *et al.*	1996	P	U	+	+	D	+
14	Winchester-The Brooks	Carrott *et al.*	1996	P	U	D	+	+	
14	York-Bedern, Area X	Hall *et al.*	1993c	5P	U	+	+	+	+
14-15	York-Bedern, Area X	Hall *et al.*	1993c	7P	U	+	+	+	+
14-15	York-Bedern, Area II	Hall *et al.*	1993a	3P	U	+	+	+	+
15	Hull-Mytongate	Miller *et al.*	1993	P	U	+	+	+	
15	Southampton, L. High St.	Grove this vol.		P	U	D	+	+	
15	Oxford-Dominican Priory	Robinson	1986	D	U	D	+	+	+
15	Worcester	Osborne	1981a	P	U	D	+	+	+
15-16	Pluscarden, Moray	Buckland	1994	P	U	D			
15-16	Stone, Staffs	Moffet & Smith	1996	M	U	+	D	+	+
15-16	Kirkwall, Orkney	Locke	1982	D	U	+			
15-17	York-Bedern, Area II	Hall *et al.*	1993a	P	U	+	+	D	+
15-17	York-Bedern, Area IV	Hall *et al.*	1993b	P	U	+	+	+	
15-17	York-Bedern, Area X	Hall *et al.*	1993c	2P	U	+	+	+	
16 +	Leicester	Girling	1981b	D	U	+	Sp.	+	+
16-17	Doncaster, S.Yorks	Smith	1989	B	U	+	+		+
17	York-Bedern, Area X	Hall *et al.*	1993c	P	U				
17	Worcester-Sidbury	Osborne	1983	P	U	D	+		
18	Womerley, N.Yorks	Wagner and Pelling	1995	D	R	+		D	
18	Hereford	Kenward	1985b	P	U	D	+	D	+
?	Chichester-South St. W.Sx.	Grove this vol.		B	U	+	D	+	+

KEY to Table 12.1

Age is given in centuries
FT = Feature type, numbers of each type are included.
B = Deposits from within a building
D = Open water filled features such as ditches or moats
M = Midden deposits or spreads of material
P = Pitfills
W = Deposits from enclosed water filled features such as wells
SA = Surrounding area
F = Military establishment
R = Rural
U = Urban
House species
Tu = *Tipnus unicolor*
Pf = *Ptinus fur*
Mh = *Mycetaea hirta*
Ab = *Aglenus brunneus*
Recording codes for taxa
+ = Taxon present
D = Dominant species
Sp. = *Ptinus* species indet.

Table 12.2: Distribution of selected grain pests in archaeological assemblages in Britain from the Roman to the post-medieval period, arranged in chronological order.
See below for key to abbreviations used.

Age	Location	Author and date		FT	SA	Grain pests				
						Os	Sg	Pr	Cf	T
1	Bancroft, Bucks.	Pearson & Robinson	1994	D	R	+				
1	Dragonby, N. Lincs.	Buckland	1996	W	R		+			
1	Fishbourne-Harbour, W.Sx.	Osborne	1971a	D	F				Sp.	
1	York-Coney St.	Kenward & Williams	1979	D	U	+			+	
1	London-Copthall Ave	Moulins, D. de	1990	7D	U	+	+		+	
1	Carlisle-OGLA, Cum & West	Kenward *et al.*	1992b	4B	U	+		+	+	
1	Carlisle-OGLA, Cum & West	Kenward *et al.*	1992b	7M	U	+	+	+	+	
1	Carlisle-OGLA, Cum & West	Kenward *et al.*	1992b	4P	U	+	+	+	+	
1	Alchester, Oxon.	Robinson	1975	D	U					
1	Alcester, Warks.	Osborne	1971b	P	U		+	*sd*		
1	Carlisle-OGLB, Cum & West	Kenward *et al.*	1992c	2M	U	+	+	+	+	
1	Carlisle-OGLA, Cum & West	Kenward *et al.*	1992b	4D	U	+	+	+	+	
1-2	Papcastle, Cumb.	Kenward & Allison	1988	U	F	+	+	+	+	
1-2	Kirkham, Lancs.	Carrott *et al.*	1995a	2D	F	+	+	+	+	
1-2	Exeter, Devon	Straker *et al.*	1984	2D	F		+			
1-2	Winchester- The Brooks	Grove this vol.		D	U	+				
1-2	York-Coney St.	Kenward & Williams	1976	B	U	+	+	+	+	
1-2	Carlisle-LELA, Cum & West	Kenward *et al.*	1992a	5M	U	+	+	+	+	
2	York-Church St.	Buckland	1976b	D	F	+	+		+	+
2	South Shields, Co.Durham	Osborne	1994b	P	F	+	+		+	
2	Carlisle-OGLB, Cum & West	Kenward *et al.*	1992c	W	U	+	+	+	+	
2	Carlisle-LELA, Cum & West	Kenward *et al.*	1992a	P	U	+	+	+	+	
2	York-Rougier St.	Hall & Kenward	1990	D	U	+	+		+	
2	York-Tanner Row	Hall & Kenward	1990	D	U	+	+	+	+	
2	York-Tanner Row	Hall & Kenward	1990	2B	U	+	+	+	+	
2	York-Tanner Row	Hall & Kenward	1990	D	U	+	+		+	
2	York-Tanner Row	Hall & Kenward	1990	2P	U	+	+	+	+	
2	York-Tanner Row	Hall & Kenward	1990	2B	U	+	+	+	+	
2	York-Tanner Row	Hall & Kenward	1990	M	U	+	+	+	+	
2-3	York-Bedern	Kenward *et al.*	1986	P	F	+	+	+	+	
2-3	London-Copthall Ave	Moulins, D. de	1990	D	U	+	+		+	
2-3	London-Copthall Ave	Moulins, D. de	1990	B	U	+	+			
2-3	York-Skeldergate	Hall *et al.*	1988	P	U	+	+	+	+	*ca*
2-3	York-Tanner Row	Hall & Kenward	1990	B	U	+	+	+	+	
2-3	Carlisle-OGLA, Cum & West	Kenward *et al.*	1992b	2M	U	+		+	+	
3	Kirkham, Lancs.	Carrott *et al.*	1995a	2D	F	+	+		+	
3	Bancroft, Bucks.	Pearson & Robinson	1994	P	R					
3	Appleford, Oxon.	Robinson	1981a	W	R		+			
3	Lincoln	Carrott *et al.*	1995c	5M	U	+	+	+	+	
3	York-Tanner Row	Hall & Kenward	1990	P	U	+	+	+	+	
4	Rudston, Yorks.	Buckland	1980	W	R	+				
3-4	TV-Farmoor, Oxon.	Robinson	1979	4W	R					

Age	Location	Author and date		F.T	S.A	Grain pests				
						Os	Sg	Pr	Cf	T
4	Appleford, Oxon.	Robinson	1981a	2W	R					
4	York-Church St.	Buckland	1976a	D	F	+			+	
4	Bancroft, Bucks.	Pearson & Robinson	1994	D	R				+	
4	Barnsley Park, Glos.	Coope & Osborne	1968	W	R	+				
4	Alchester, Oxon.	Robinson	1975	D	R	+				
4	London-Copthall Ave	Moulins, D. de	1990	2P	U	+	+		+	
4	Droitwich, Worcs.	Osborne	1977	D	U	+			+	
4	Lincoln	Carrott *et al.*	1995c	6M	U	+	+	+	+	*ca*
4	Towcester, Northants.	Girling	1983	2D	U	+	+		+*t*	*2c*
4	London-Copthall Ave	Moulins, D. de	1990	4D	U	+			+	+
4	Chichester-Market, W.Sx.	Girling	1989	W	U	+	+		+	*ca*
5	York-Tanner Row	Hall & Kenward	1990	2P	U	+				
10-11	Winchester- The Brooks	Carrott *et al.*	1996	P	U	+	+			
11	Winchester- The Brooks	Grove this vol.		P	U	+				
12-14	Beverley-Priory	Allison *et al.*	1996	3P	U		+			
13	York-Tanner Row	Hall & Kenward	1990	3P	U	+	+	+	+	
13	York-Bedern, Area II	Hall *et al.*	1993a	P	U		+			
13	York-Bedern, Area IV	Hall *et al.*	1993b	P	U		+			
13	Leicester	Girling	1981b	D	U	+	+			
13-14	London-Southwark	Tyers	1988	P	U		+			
13-14	Hull-Chapel Lane	Kenward	1979c	D	U	+	+			
14	Cowick, S. Humb.	Girling and Robinson	1989	D	R	+	+			
14	Hull-Mytongate	Miller *et al.*	1993	P	U	+	+			
14	Winchester- The Brooks	Carrott *et al.*	1996	P	U	+	+		+	
14	Winchester- The Brooks	Carrott *et al.*	1996	P	U	+	+		+	
14	York-Bedern, Area X	Hall *et al.*	1993c	5P	U	+	+			
14-15	York-Bedern, Area X	Hall *et al.*	1993c	7P	U	+	+			
15	Hull-Mytongate	Miller *et al.*	1993	P	U	+	+			
15	Southampton, Hants.	Grove this vol.		P	U	+	+		+	+
15	Oxford-Dominican Priory	Robinson	1986	D	U	+	+			
15	Worcester	Osborne	1981a	P	U	+	+			
15-16	Stone, Staffs	Moffet & Smith	1996	M	U		+			
15-16	Kirkwall, Orkney	Locke	1982	D	U	+				
15-17	York-Bedern, Area II	Hall *et al.*	1993a	P	U	+	+		Sp.	
15-17	York-Bedern, Area IV	Hall *et al.*	1993b	P	U	+	+			
15-17	York-Bedern, Area X	Hall *et al.*	1993c	2P	U	+	+			
16 +	Leicester	Girling	1981b	D	U	+	+			
16-17	Doncaster, Yorks	Smith	1989	B	U		+			
17	York-Bedern, Area X	Hall *et al.*	1993c	P	U	+	+			
17	Worcester-Sidbury	Osborne	1983	P	U	+	+			
18	London-Cutlers Gdns	Girling	1984	P	U				Sp	
18	Hereford	Kenward	1985b	P	U			?		

KEY to Table 12.2

Age is in centuries
FT = Feature type, numbers of each type are included.
B = Deposits from within a building
D = Open water filled features such as ditches or moats
M = Midden deposits or spreads of material
P = Pitfills
W = Deposits from enclosed water filled features such as wells
SA = Surrounding area
F = Military establishment, like a fort or castle
R = Rural
U = Urban
Grain species
Os = *Oryzaephilus surinamensis*
Sg = *Sitophilus granarius*
Pr = *Palorus ratzburgi*
Cf = *Cryptolestes ferrugineus*
T = *Tribolium* species
Recording codes for taxa
\+ = *Taxon present*
Sp. = *Cryptolestes* sp.
+t = *C. ferrugineus* and *C. turcicus*
sd = *P. subdepressus*
ca = *T. castaneum*
2c = *T. castaneum* and *T. confusum*

Fig. 13.1a: Pit faunas, CANOCO samples plot, 31 pit assemblages. Key to colour rims: Brown = York; pink = Winchester

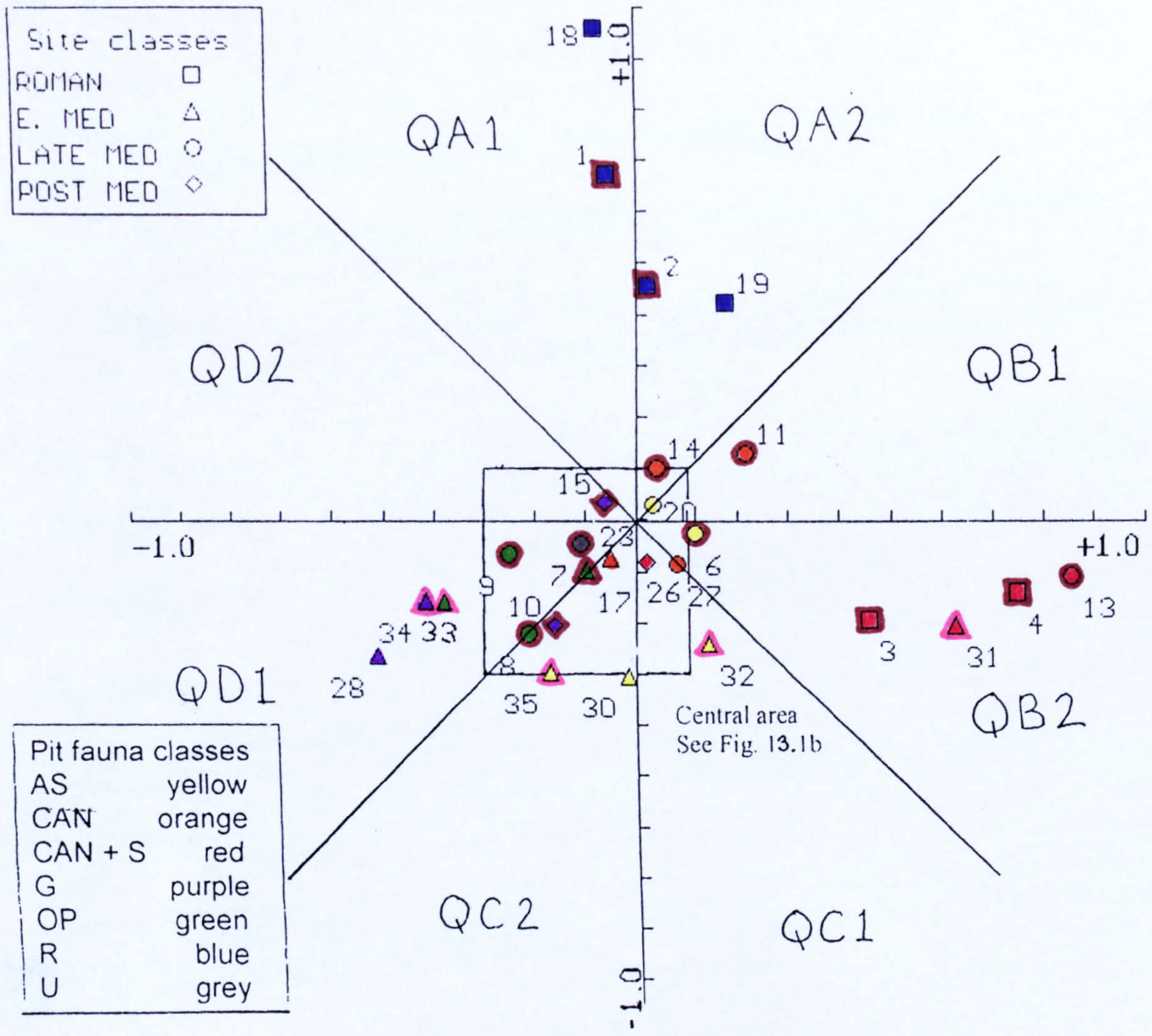


Fig. 13.1b: Pit faunas, detail of central area, Fig. 13.1a. Key to colour rims: Brown = York; pink = Winchester

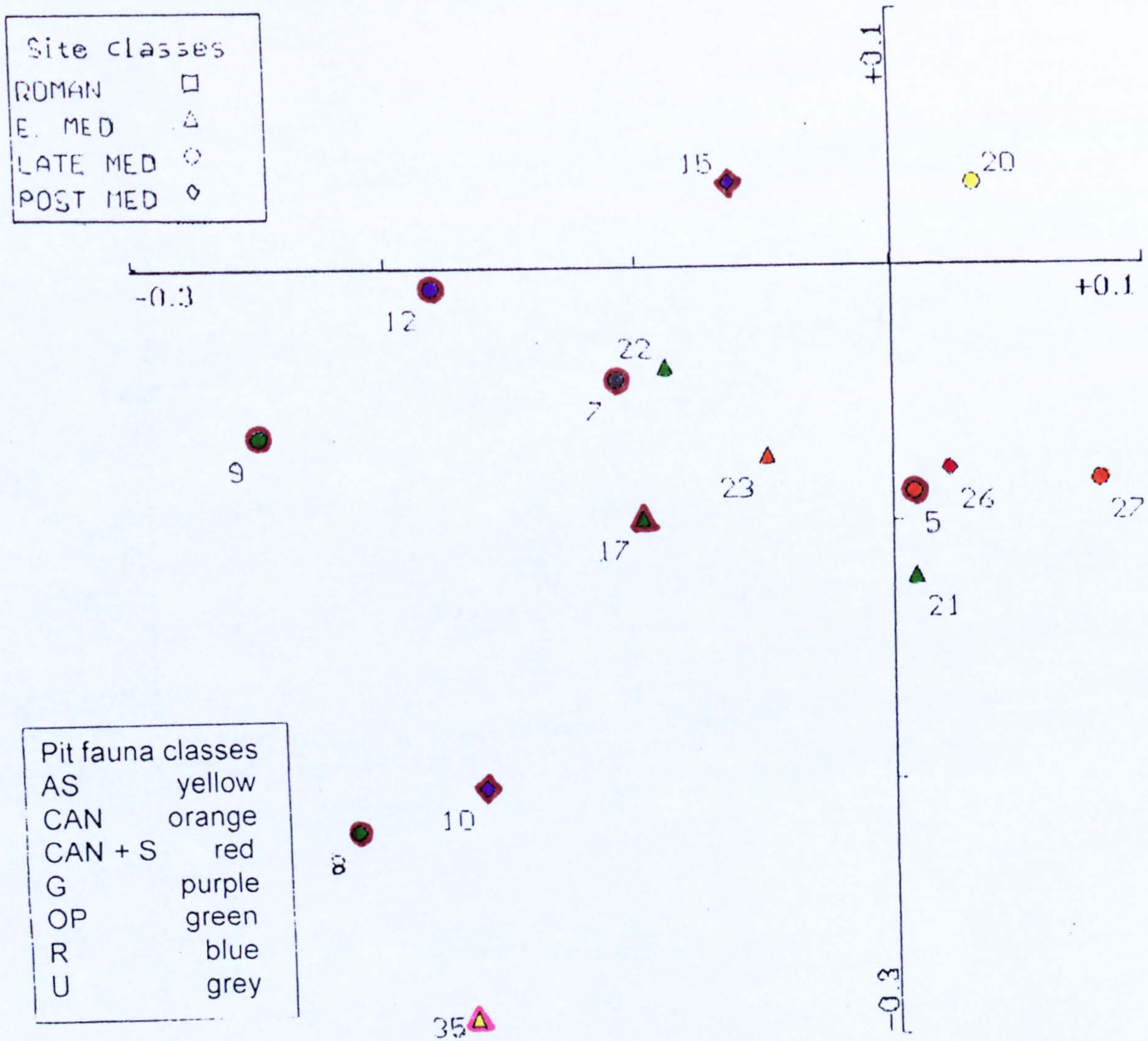


Fig. 13.2a: Pit faunas, CANOCO species plot, 31 pit assemblages

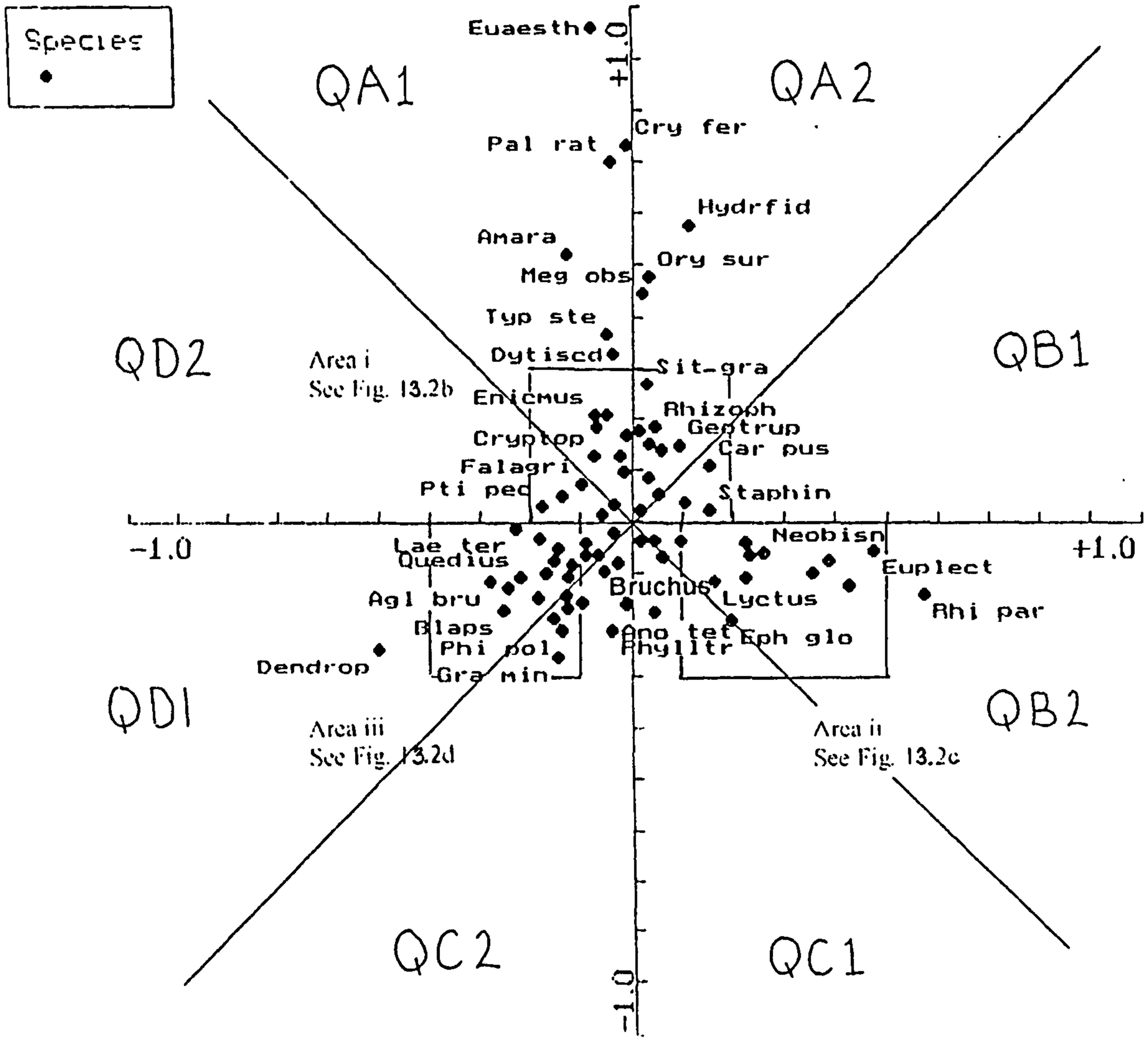


Fig. 13.2b: Pit faunas, detail of Area i, Fig.13.2a

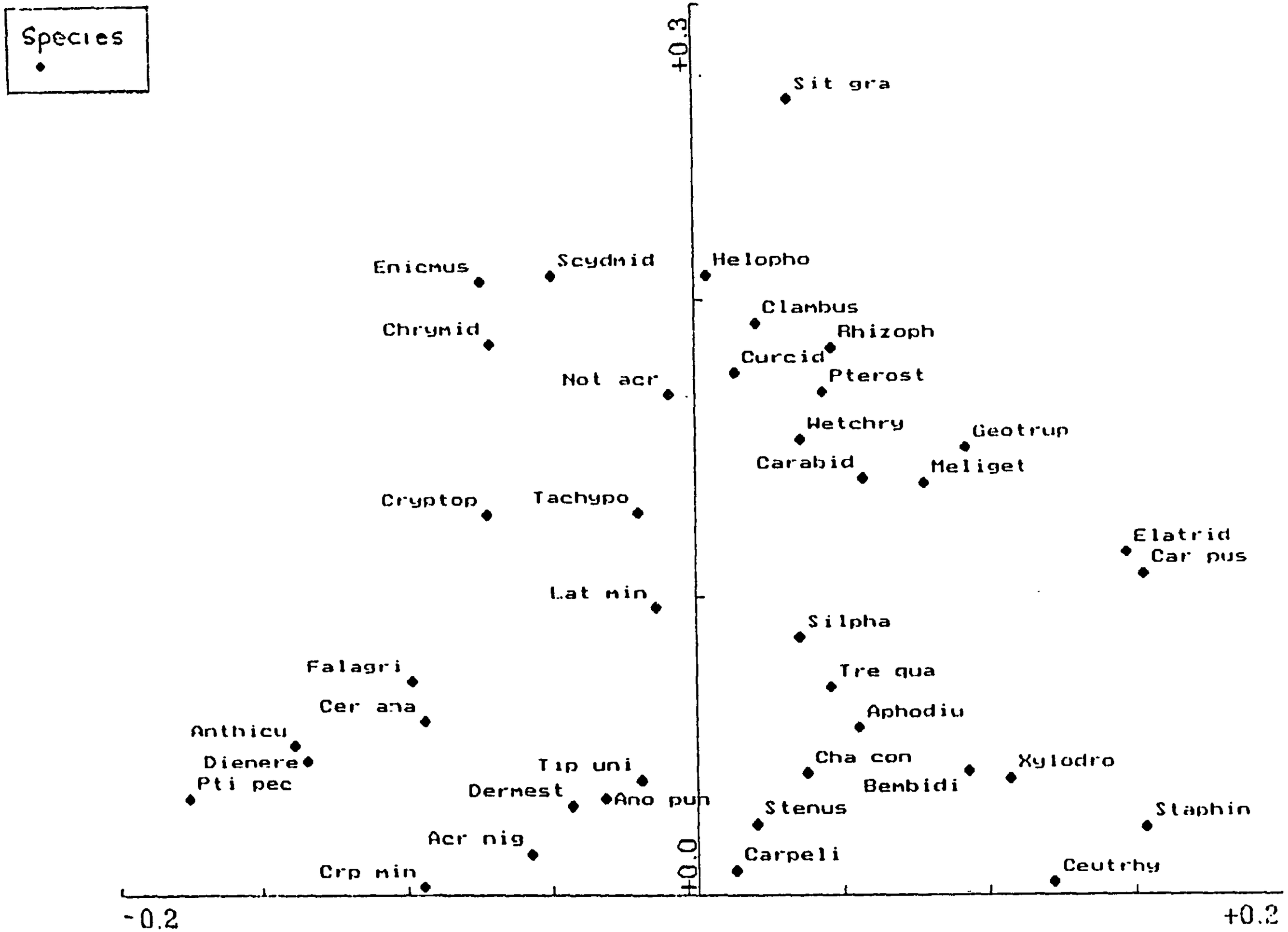


Fig. 13.2c: Pit faunas, detail of Area ii, Fig.13.2a

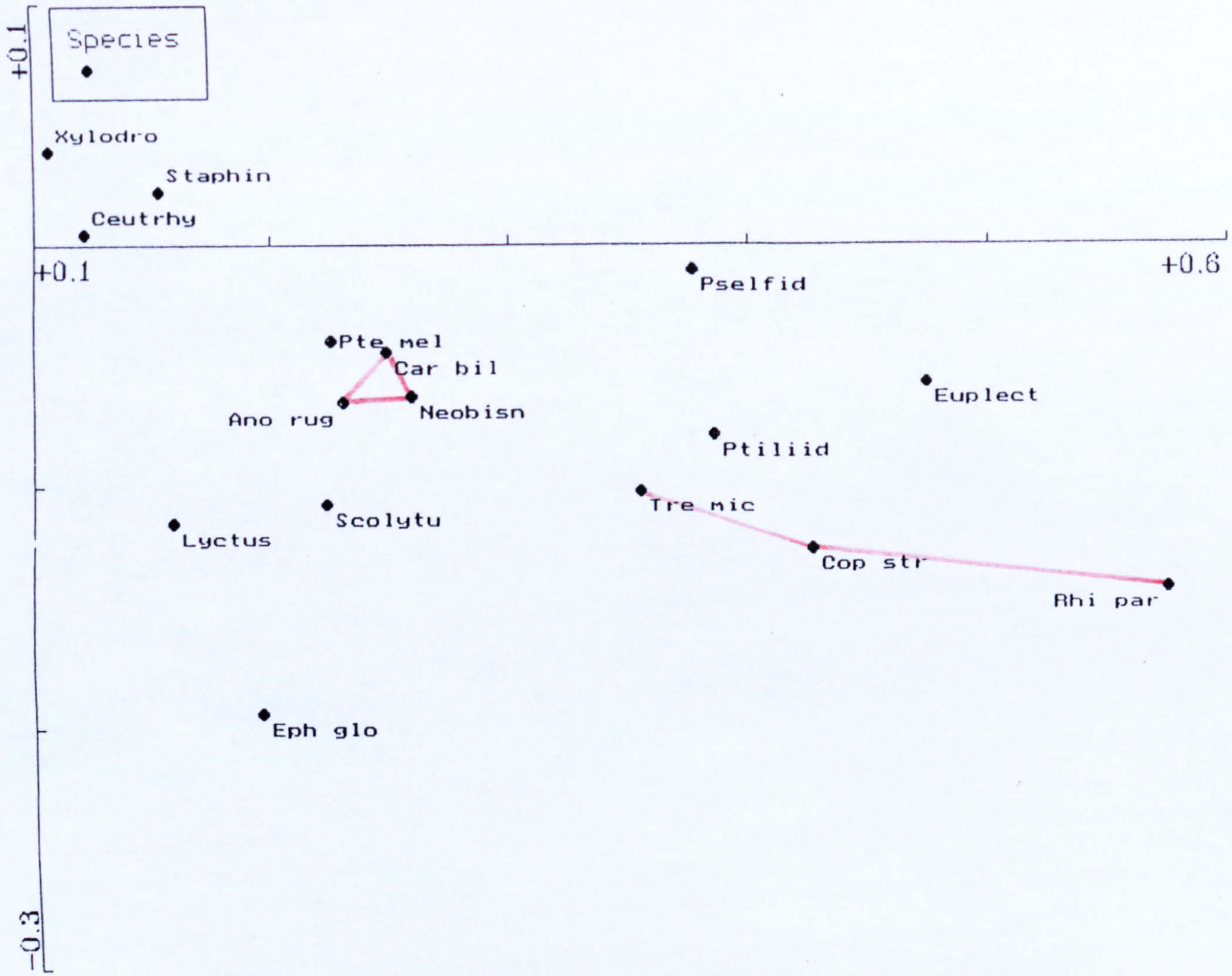


Fig. 13.2d: Pit faunas, detail of Area iii, Fig.13.2a

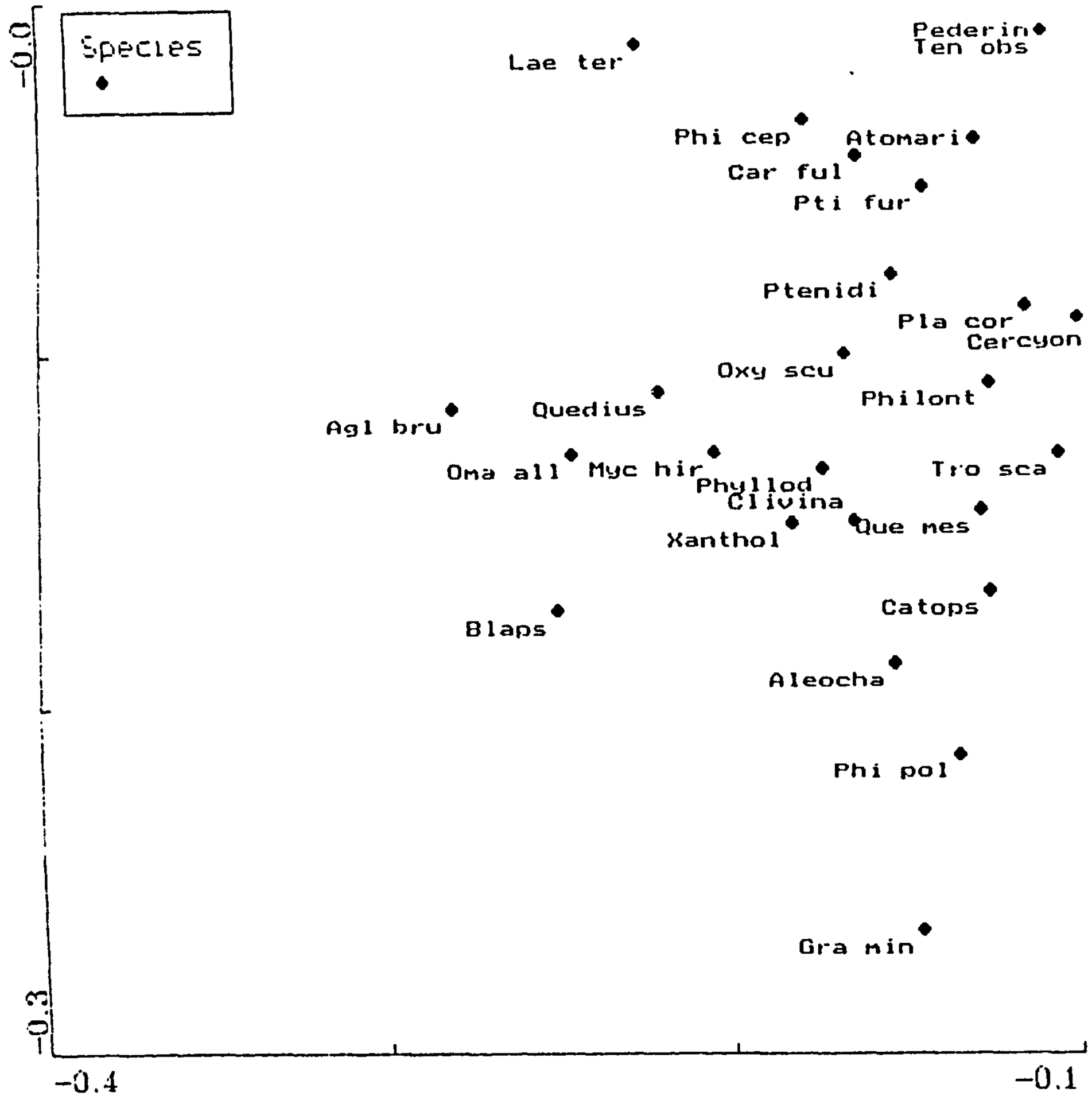


Fig. 13.3: Pit faunas.
The proportions of beetles from different habitats in assemblages arranged by period.
R = Roman; EM = Early medieval: LM = Late medieval: PM = Post medieval
See Fig. 6.1 for key.

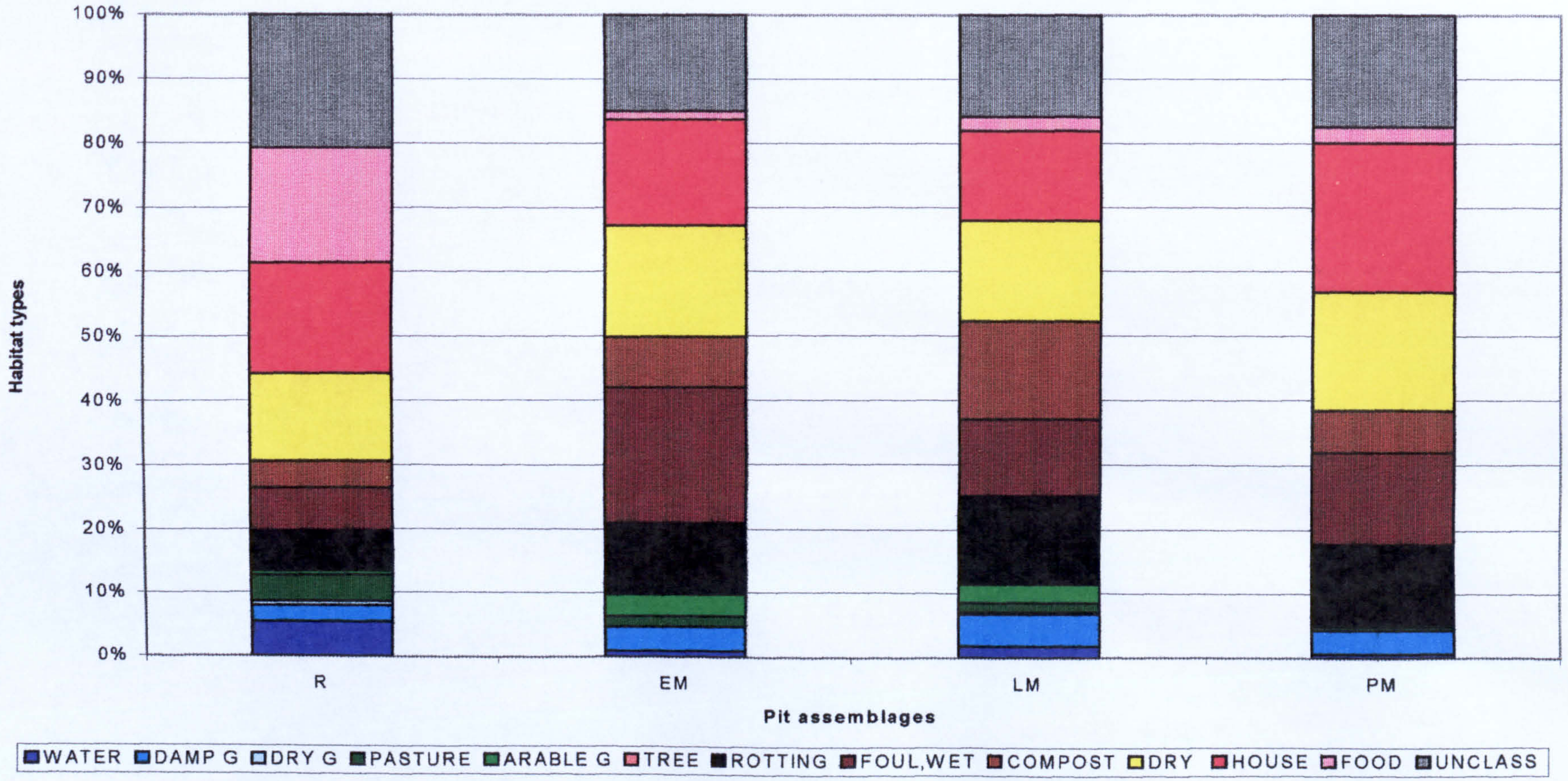


Fig. 13.4: Pit faunas.
The proportions of beetles from different habitats in assemblages arranged by the ordering from the CANOCO analysis.
For position of the quadrants see Figs 13.1; 13.2.
See Fig. 6.1 for key.

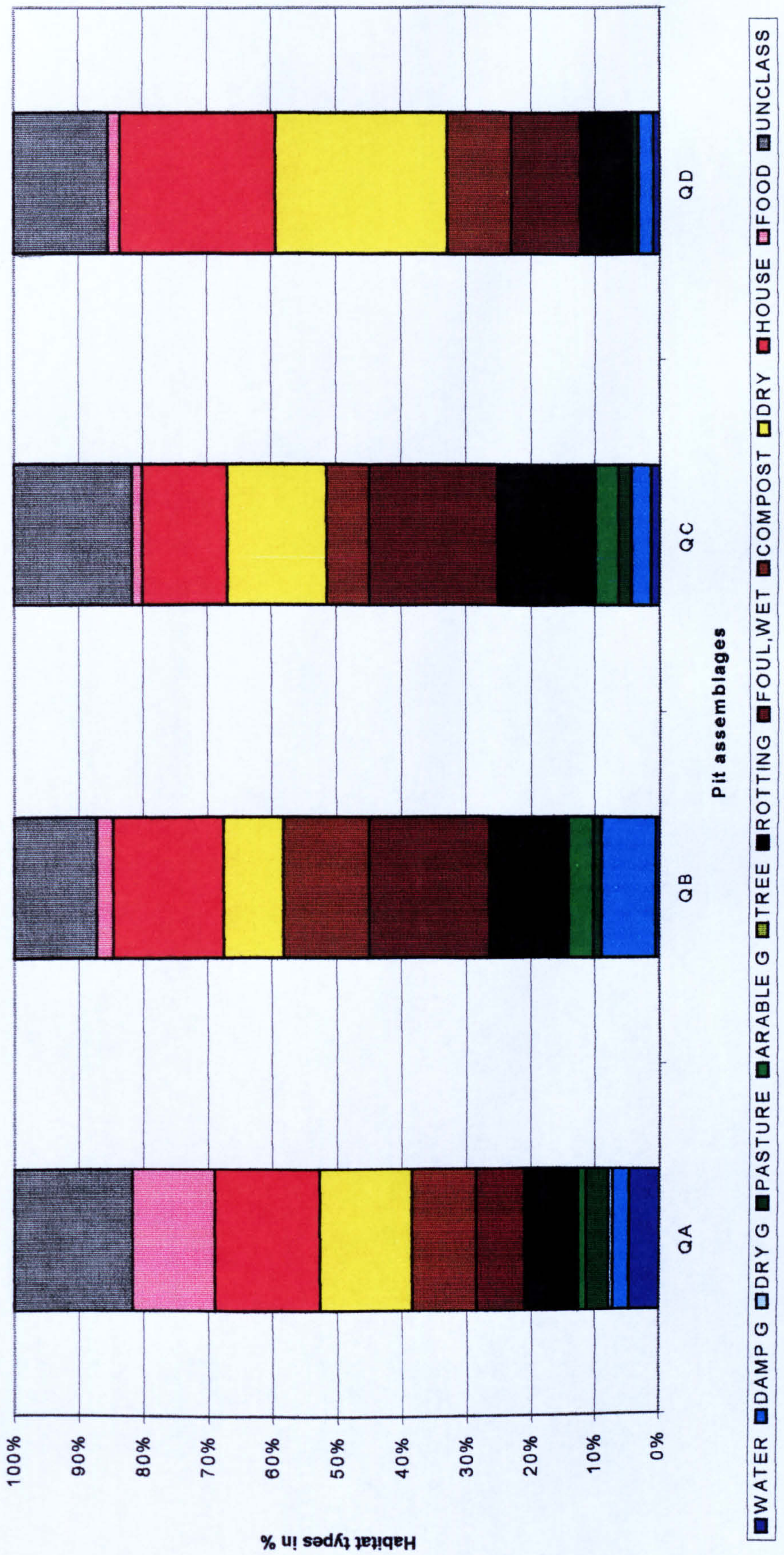


Fig. 13.5: Pit faunas.
The proportions of beetles from different habitats in assemblages arranged by the faunal groups.
See Fig. 6.1 for key.

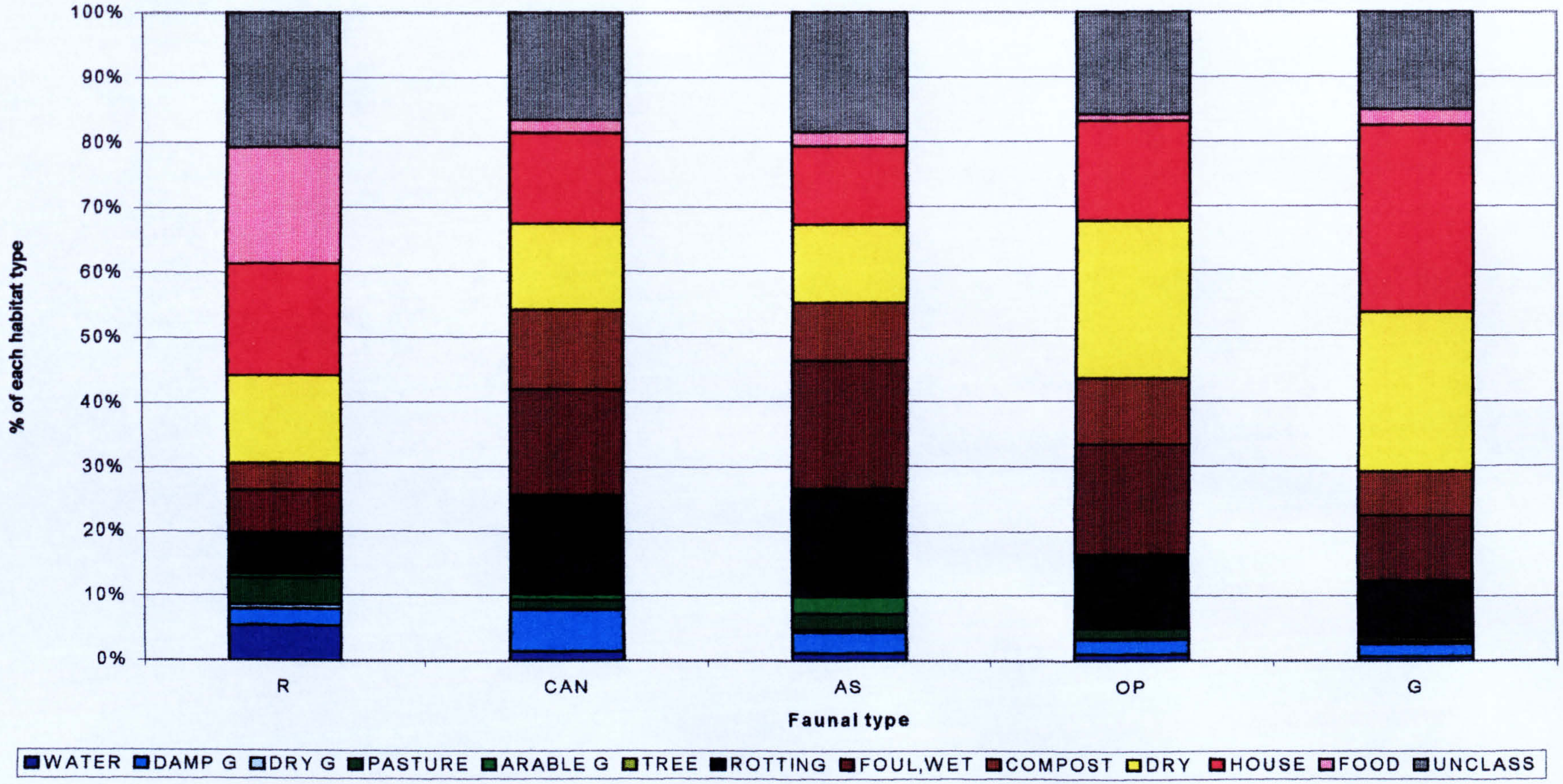


Fig. 13.6: Pit faunas
The proportions of beetles from different ecological groups in assemblages arranged by faunal group.

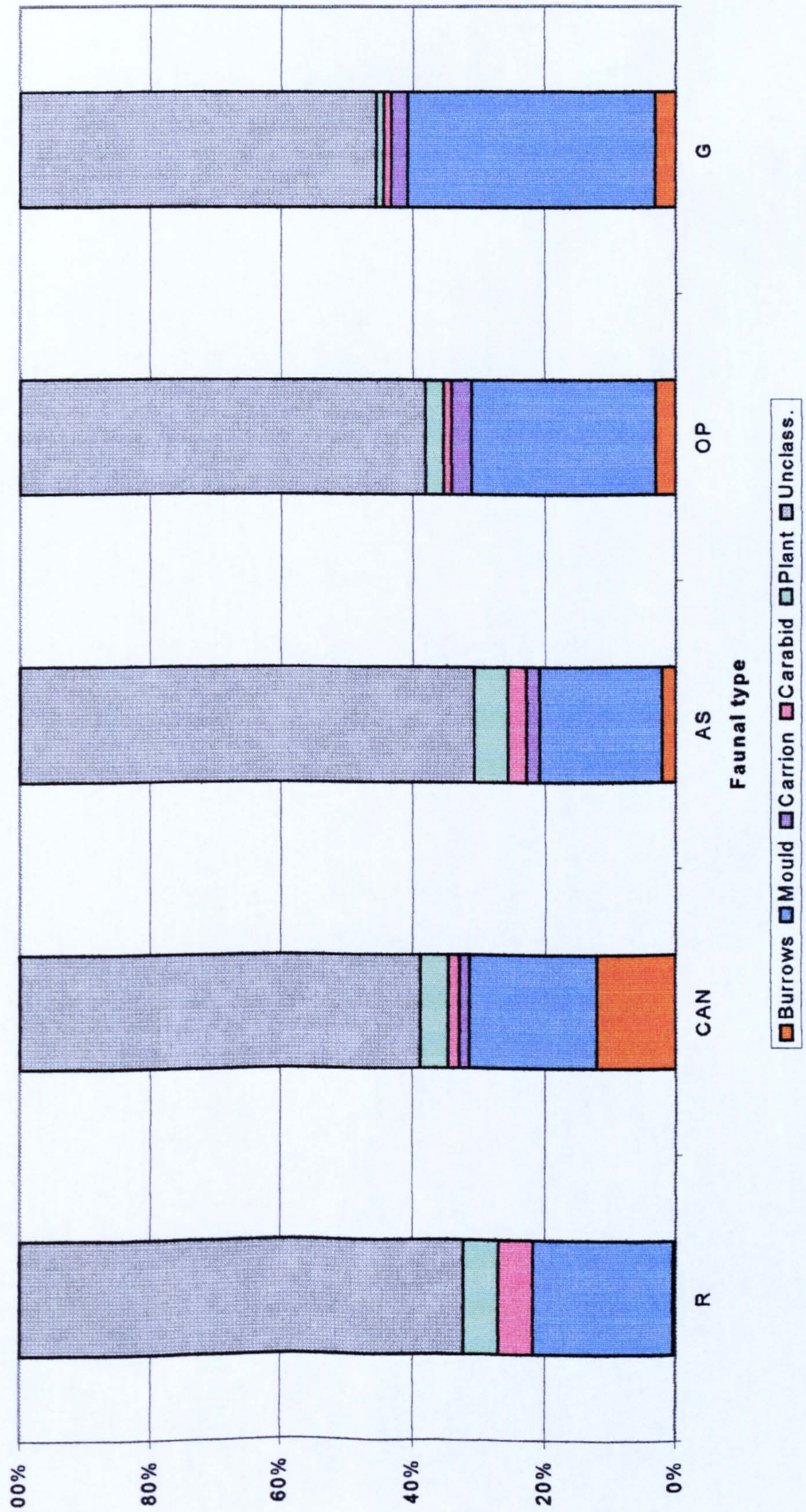
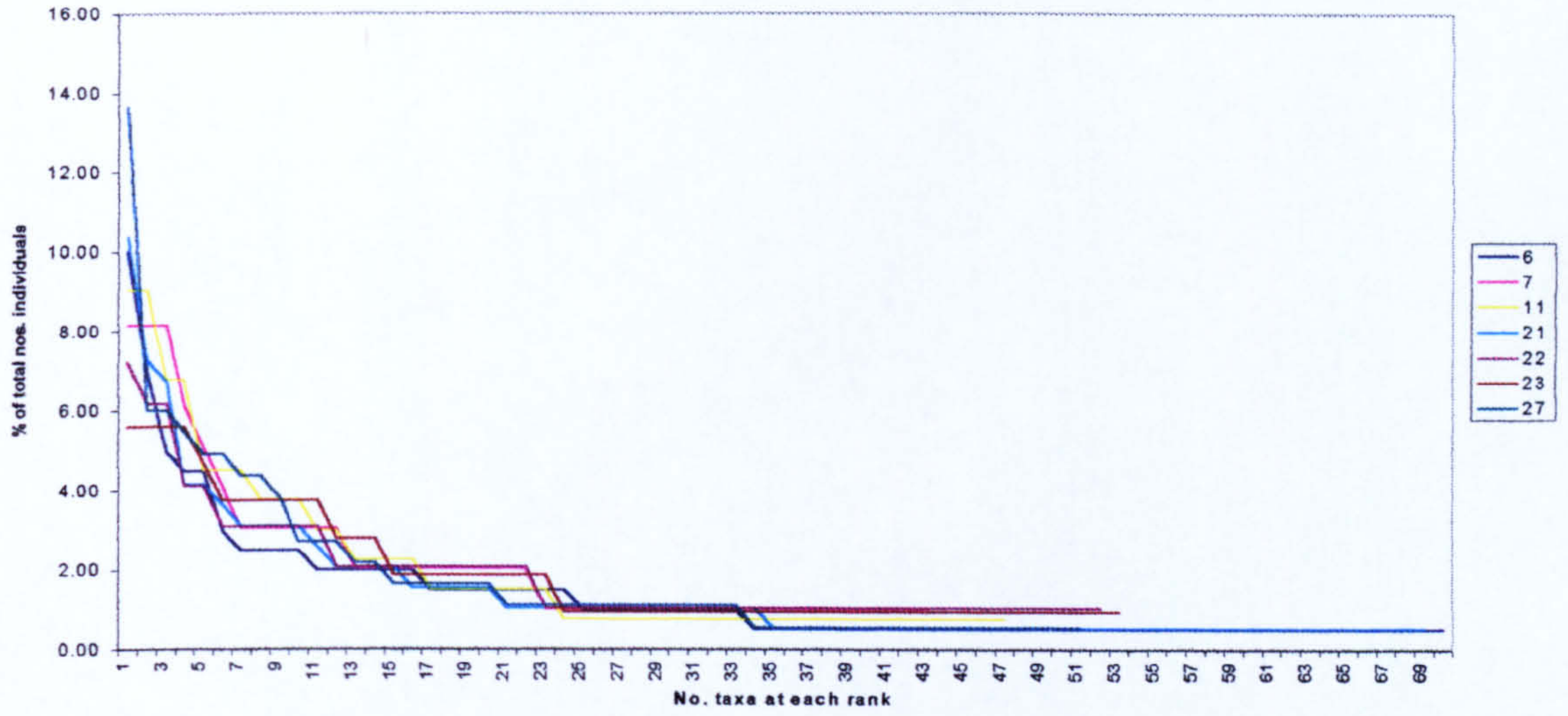
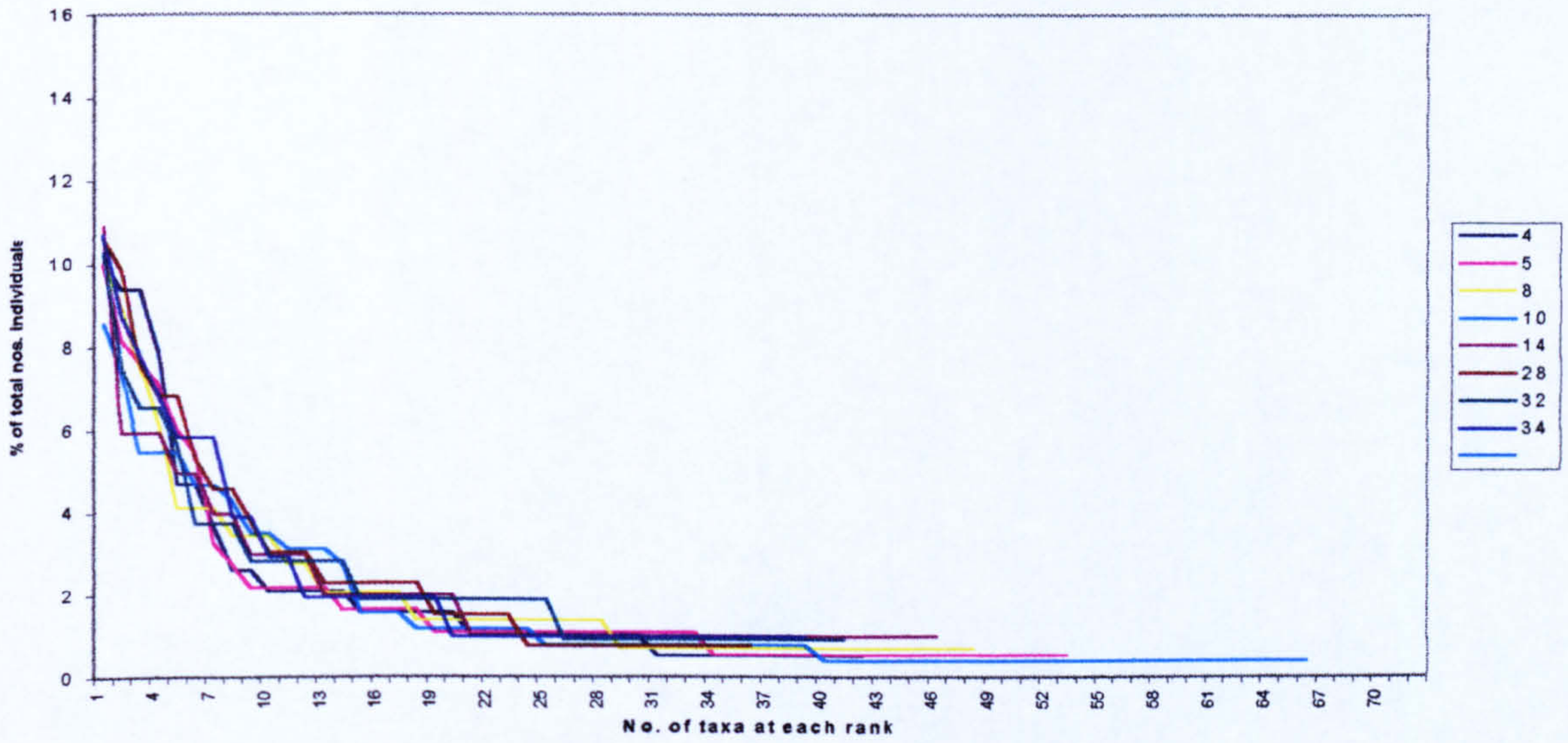


Fig. 13.7: Pit faunas.
Rank order curves of assemblages arranged in order of maturity. See text for details.
A: Newly formed assemblages. Combined index of diversity, Fisher's $\alpha = 31$



B: More established faunas. Combined index of diversity, Fisher's $\alpha = 23$



C: Faunas with some breeding species. Combined index of diversity, Fisher's $\alpha = 17$

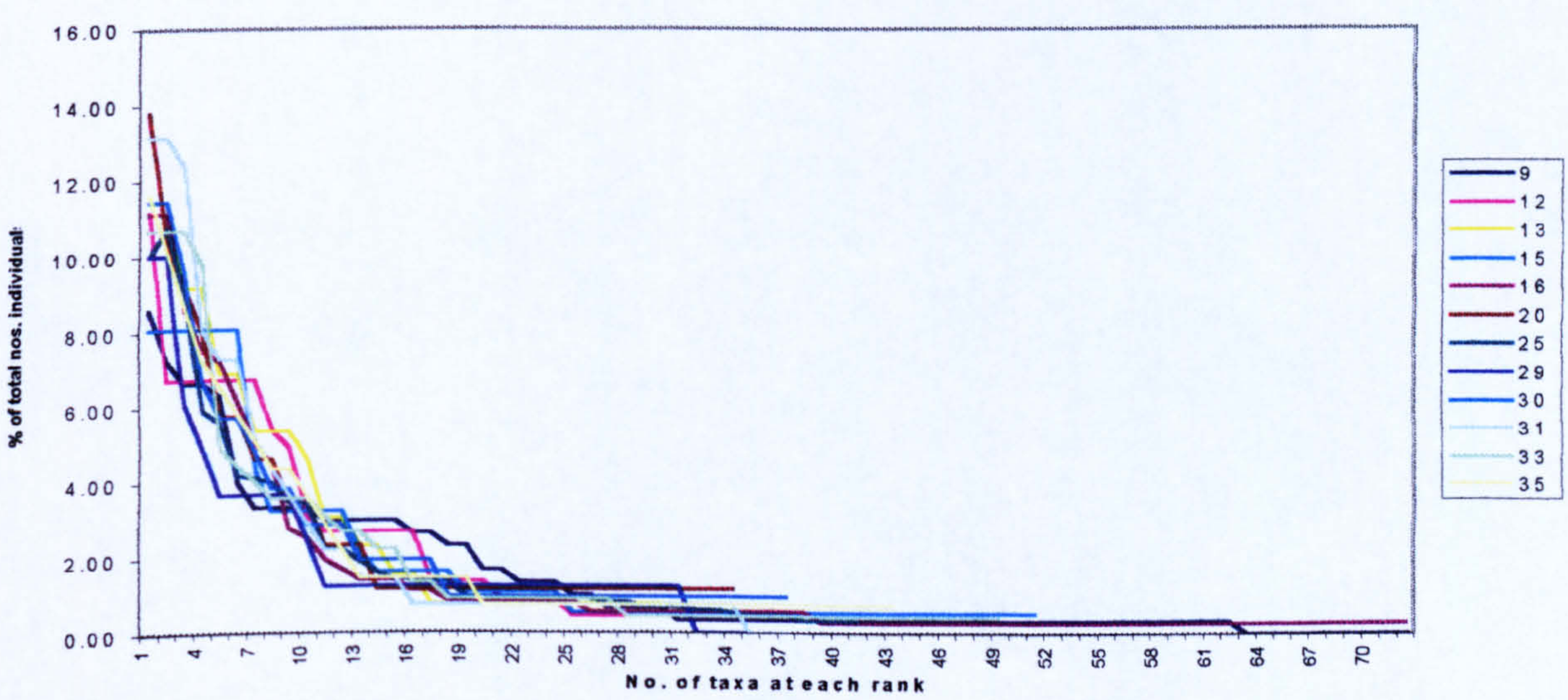


Table 13.1: Pit faunas, details of pits investigated in Chapter 13

No.	Site	Author and date	Context nos.	Feature details	Age	Fill details	MNI	R	Other animal details (non-Coleopteran)	L	Z
1	York Tanner Row	Hall and Kenward 1990	4.1.3; 4278 (2)	Square, deep lined, stone and wood	Late 2nd	Plant remains, much charcoal,	74	FQ	Aquatics (Daphnia, Trichoptera) No gut parasites	U	3
2	York Tanner Row	Hall and Kenward 1990	4.3.3; 4254, 4207, 4208	Rectangular	Late 2nd	Peatland, grassland plants, food, varied deposits	238	SQ	Flea No gut parasites	U	3
3	York Tanner Row	Hall and Kenward 1990	2.27.3; 2054, 2055	Cut into floor of Roman building	4th+	Some cess	72	SQ	Gut parasites	U	3
4	York Tanner Row	Hall and Kenward 1990	2.27.4; 2030, 2036	Cut into floor of Roman building	4th+	Some cess	193	SQ	Gut parasites	U	3
5	York Tanner Row	Hall and Kenward 1990	1.12.1; 1172 (2), 1253, 1255	Timber lined pit	11th-12th	Some cess, trace dye plants Arable weeds	185	SQ	Gut parasites	U	3
6	York Tanner Row	Hall and Kenward 1990	3.16.1; 3001 (2), 3005 (2)	Timber lined well	13th	Some cess, moss	217	SQ	Fleas Leptaceran flies Gut parasites	U	3
7	York Bedern NE Area II	Hall *et al.* 1993a	1774; 79/1	No details	13th	Some cess? Hay, some residual or intrusive material	98	FQ	Trace gut parasites	U	3
8	York Bedern NE Area II	Hall *et al.* 1993a	1505A; 56/1	Large pit –no details Varied fills	14th	Some cess, Weeds	150	FQ	Few gut parasites	U	3
9	York Bedern NE Area II	Hall *et al.* 1993a	1359B 39/1	Large pit–no details Varied fills	14th-15th	Cess, Brassica Sedges etc	151	FQ		U	3
10	York Bedern NE Area II	Hall *et al.* 1993a	1183A; 20/1, 22/1, 23/1, 24/1	Large pit	15th-17th	Cess 11 samples taken for intra context variation study	205	FQ		U	3
11	York Bedern SW Area X	Hall *et al.* 1993c	5468A+C; 585/T, 579/T		14th	Hay-filled pit cuts cesspit	179	SQ	Flea Some flies & trace gut parasites	U	3

No.	Site	Reference	Context nos.	Feature details	Age	Fill details	MNI	R	Other animal details (non-Coleopteran)	L	Z
12	York Bedern SW Area X	Hall *et al.* 1993c	5497; 598/T	Large pit	14th	Cess, moss etc.	224	SQ	Flies and many gut parasites	U	3
13	York Bedern SW Area X	Hall *et al.* 1993c	5406; 524/T, 525/T	Large pit	14th-15th	Some cess, weeds	151	SQ	Some gut parasites	U	3
14	York Bedern SW Area X	Hall *et al.* 1993c	5273; 438/T	Small pit?	14th-15th	Cult & waste weeds Occupational debris; Food waste	105	SQ	Wasps, 2 fleas, few flies and gut parasites	U	3
15	York Bedern, SW Area X	Hall *et al.* 1993c	5338H 467/T	Deep pit?	15th-17th	Some food (fig) = cess? Stable waste?	192	SQ	Flies and trace gut parasites	U	3
16	York Bedern, NE Area I	Kenward *et al.* 1986	19; 1	Top bell shaped pit	8th	Wetland plants	410	FQ	Daphnia, caddis	U	3
17	York 16-22 Coppergate	Hall *et al.* 1983b	20178	Small unlined pit	9th-10th	Cess, hay	80	FQ	Flies: -*Fannia scalaris* *Musca stabularis* *Sepsis punctum* *Copromyza equina* & gut parasites	U	3
18	Carlisle LELA	Kenward and Carrott 1992a	365.2; 6/T	Pit, no further details	2nd	No details	293	FQ	Many flies, trace of gut parasites	U	4
19	Carlisle OGLA	Kenward *et al.* 1992b	1116-7; 59/T, 60/T	Pit, no further details	1st	Back fill?	101	FQ	Some flies, trace of gut parasites	U	4
20	Lincoln Waterside NW	Carrott *et al.* 1995	308; 34/T	Shallow, damaged, timber lined	12th-13th	Some cess Floor material?	117	FQ	Limosinine sphaerocerid flies, few gut parasites	U	3
21	Lincoln Waterside NW	Carrott *et al.* 1995	391; 11/T	Wattle lined	10th	Cess, moss	199	FQ	Limosinine sphaerocerid flies inc. *Sepsis, Themira* *Thoraco-chaeta zosterae* Gut parasites	U	3
22	Lincoln Woolworth's	Carrott *et al.* 1995	526; 10/T	Circular pit + gulley	10th	Cess	99	FQ	Bed bug, marine molluscs, Flies, *Spelobia, T. zostera* Gut parasites	U	3

No.	Site	Reference	Context nos.	Feature details	Age	Fill details	MNI	R	Other animal details (non-Coleopteran)	L	Z
23	Lincoln Woolworth's	Carrott *et al.* 1995	533; 24/T	Oblong, capped by planks	10th	Some cess and open textured plant matter?	121	FQ	Flea, some aquatic spp. Few flies inc. *T. zostera* Few gut parasites	U	3
24	London Copthall Ave,	Allison and Kenward 1987	?Pit 110	Possibly well?	3th-4th		C95	RS	Many water spp. Not tested for gut parasites	U	2
25	Alcester	Osborne 1971	Pit F	No details, disused well?	1st	Pieces of leather, bones	1570	FQ	Not tested for gut parasites	U	2
26	Hereford	Girling and Kenward 1985	Pit 651	No details	18th	Kitchen waste? Pot, glass, bone,	C 388	PQ	Many flies, not tested for gut parasites	U	2
27	Hen Domen Wales	Greig *et al.* 1982	Pit 1/27 11 12e , 13s	Abandoned well? in Norman castle Layers studied 6m deep	12th-13th	Layer11 more mineral like 12eWood chips, bone 13e Bracken horseshoe nails No cess	194	FQ	Plants of disturbed land and damp meadows Few flies, none in Layer 11, no gut parasites	U	2
28	Dublin Ireland	Coope 1981	Pit 46/1 Sample no. 567	Just outside house	11th	Floor coverings?	142	FQ	Fleas, flies not tested for gut parasites	U	3
29	Southampton Granville St.	Buckland *et al.* 1976	SAR XI F 47 Fill 1	4 similar pits Rect. flat bottom	8th	Bucket of buried dung Formed late summer, early autumn?	99	FQ	Gut parasites	U	1
30	Southampton Lower High St.	Grove this vol	Pit 108; 2165 Samples 1a;2a	Unlined pit	11th	Cess Straw?	122	FQ	Not tested for gut parasites	U	1
31	Winchester The Brooks	Grove this vol	5799; 275	Timber lined pit Late Saxon body slumped into it	10th	Cess Straw?	177	FQ	Many flies, not tested for gut parasites	U	1
32	Winchester The Brooks	Grove this vol	5761; 281	Unlined pit	9th-10th	Cess Straw?	113	FQ	Not tested for gut parasites	U	1

No.	Site	Reference	Context nos.	Feature details	Age	Fill details	MNI	R	Other animal details (non-Coleopteran)	L	Z
33	Winchester The Brooks	Grove this vol	5726; 228	Upper backfill well	11th-12th	Cess Straw?	238	FQ	Not tested for gut parasites, many flies	U	1
34	Winchester The Brooks	Grove this vol	5726; 236	Lower backfill well	11th-12th	Cess, Straw? Possibly includes well sump contents	112	FQ	Not tested for gut parasites, many flies	U	1
35	Winchester Lower Brook St	Osborne unpub.	283; 1853, 363 = E	Timber lined pit	10th	Straw, twigs and bark, tufts of hair	161	FQ	Some water beetles Many Sphaerocerid flies Not tested for gut parasites,	U	1

Key for Tables 13.1 and 14.1, see also Table 13.2

No.	Context nos.	Fill details	R = Recording level	Other biological details (non Coleopteran)	L = Location	Z = Zone
No. of sample on CANOCO plot.	Feature no. followed by fill no (s) or sample no.	Cess is not included here unless other non insect indicators are present: Food waste = inedible waste e.g. bone, shell Occupational waste = inorganic waste e.g. pot, tile	FQ = All taxa fully quantified. SQ = Semi quantified; top level or top two levels estimated at 15 and 6. PQ = Partially quantified, 3 levels above 1, all estimated. RS = Rapid scan, 3 levels, all estimated. **For numerical equivalents used for estimated nos see Table 14.2.** AE = Aloecharines estimated at 5% of total nos.	Hemiptera have not been recorded	U = Intensively occupied area R= Rural See Fig. for further details	Geographical zones, see Fig. 6.1

Table 13.2: Pit and Features faunas

Numerical equivalents of the estimates given for some assemblages

Method of recording	Sample Nos	MNI	Recorded name	Numerical equivalent used in present analysis.
PQ	26	1	1	1
		2-10	F (few)	5
		10-20	QC (quite common)	15
		Above 20	C (common)	25
RS	24 ,36	1-3	P (present)	1
		4-9	C (common)	6
		10-20	Abundant	20

Table 13.3: Pit faunas, original entries, actual figures (except 25, see text). Superabundants in bold. See Fig. 6.1 for eco-codes.

Pit sample numbers	ECO CODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Nebria brevicollis (F.)	GD C																											1								
Notiophilus biguttatus (F.)	GX C						1																													
Notiophilus spp.	GX C																																			1
Clivina spp.	GD B																					1		1			1			1				1	1	1
Dyschirius spp.	GD C																1		1					1												
Trechus micros (Hbst.)	GD B		1	2	10	4	1		1	1	2	1	1	9													15				1	1		1	
Trechus obtusus/4-striatus	UU C		2			3	3							1	1	1			1						1			1						1		1
Bembidion biguttatum (F.)	GD C																								1											
Bembidion spp.	GD C		2		1		1		1			1				1	1			1		1	2		2	0.5		1				1				
Patrobus atrorufus (Strom.)	GD C															1																				
Harpalus spp.	GX C					1															1		1													1
Acupalpus spp.	GD C						1																													
Pterostichus nigrita (Payk.)	GD C																				1														1	
Pterostichus melanarius (Ill.)	UU C		1		2		1																										1		1	
Pterostichus spp.	UU C	2	1				1									1				2	1			1			1					1			
Calathus spp.	GX C																			1																
Laemostenus terricola (Hbst.)	HH C	1											2																1		2				1	
Agonum spp.	UU C																											1								
Amara spp.	GX C	1								1									1						1						1					
Carabidae spp.	UU C	2	4	2	1	1	4	1			2		1				2		1	3		3	1		1											
Hygrotus spp.	AA																								1											
Hydroporus spp.	AA	1	2							1									1																	
Agabus bipustulatus (L.)	AA																								1			1								
Rhantus spp.	AS																					1														
Colymbetes fuscus (L.)	AS																1																			
Gyrinus spp.	AS																			1																
Hydraena spp.	AA						1												1																	
Ochthebius minimus (F.)	AA																					1														1
Ochthebius spp.	AA		2								1					1					1		1		1											
Limnebius spp.	AA																							1	6				1			1				
Helophorus rufipes (d'Antic)	GA V						1																													
Helophorus grandis Ill.	AS	1																										1								
Helophorus brevipalpis group	AS																											1								
Helophorus spp.	AS	3	5			2	3	1	1		1	1	1		3	1	4		3	6	1	2	1	2	1	1		2		3					1	
Coelostoma orbiculare (F.)	AS																								6											
Sphaeridium bipustulatum F.	DF																									1.4										
Sphaeridium spp.	DF																						1		1											
Cercyon haemorrhoidalis (F.)	DF	2					1			1		2								2		14	3								1	1	2			
Cercyon melanocephalus (L.)	DF																							1												
Cercyon unipunctatus (L.)	DF																	1				4	1													
Cercyon atricapillus (Marsh)	DF	1			2	1	1						1		1				1			2														
Cercyon terminatus (Marsh.)	DF					2			3		1	3	1					1				8	2	1			15									
Cercyon pygmaeus (Ill.)	DF																	1									5									

Table 13.3: Pit faunas, original entries, actual figures (except 25, see text). Superabundants in bold. See Fig. 6.1 for eco-codes.

Pit sample numbers		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Cercyon tristis (Ill.)	GD																					1			1											
Cercyon analis (Payk.)	DC		2	4	2	13	13	2	3	7		3	2		1	2	5	5	16	1	9	5	2	1					1		1			24	2	
Cercyon spp.	DU		1	1	4		1	1	2	4	10	1	3	1			1	2		1	1	2	1	2	6	31.1	5	11		1	4	2	2		2	9
Megasternum obscurum (Marsh.)	DU	1	1				1					1				1			3	3					1					1						
Cryptopleurum minutum (F.)	DF		1							1	1						1	1								1.4	1								
Hydrobius fuscipes (L.)	AA																								1										
Anacaena globulus (Payk.)	AA																											1							
Enochrus spp.	AA																								1										
Cymbiodyta marginella (F.)	AS																								1										
Chaetarthria seminulum (Hbst.)	AA																		3																
Hydrophilus spp.	AA													1					1	1					6										
Teretrius fabricii Maz.	HT																																		1
Onthophilus striatus (Forst.)	DF																			1										1					
Acritus nigricornis (Hoff.)	DF	2		1	1		2	6	2	1	1				2				1	2		1	2	1		3.3	1		3	1			1	1	
Gnathoncus spp.	DX N																							1											
Dendrophilus spp.	DX N																												6					1	
Hister merdarius Hoff.	DU								1																		5							2	
Hister impressus F.	DU N																													1					
Hister spp.	DU					1					3		3			6		1				1				3							1		
Peranus bimaculatus (L.)	DF																									2.1									
Silpha laevigata F.	GX																											1							
Silpha spp.	UU		1																			1													
Catops/Choleva spp.	DU N					4					4					1	1					1					1	1	2		3			2	
Calyptomerus dubius (Marsh.)	DX																														1				
Clambus pubescens Redt.	DC																16				2														
Clambus spp.	DC				1			1			1						1		3				1		1		1								
Eutheia spp.	DU																													1					1
Scydmaenidae	DU	1				1			2						3	2			2			1					1								
Sericoderus lateralis (Gyll.)	DC						1																												
Orthoperus spp.	DC							1	2		1		1				42	2			1	1								3					
Ptenidium spp.	DX M	1	2			4	10	8	11	15	7		6	2		15	2	1	1			4	1	6			5		4		2		29	4
Acrotrichis spp.	DX M					2	4	2		1	1				1		15	1				4			0.7					1				
Ptiliidae	DX M				3		5		3			1																3							
Micropeplus fulvus Er.	DC M																1				7			1								1			
Megarthrus depressus (Payk.)	DU																													1					
Megarthrus spp.	DU									1							1										5								
Proteinus spp.	DU																						1	1						1					
Phyllodrepa floralis (Payk.)	DU								9						1												1						5		
Phyllodrepa spp.	UU					2					1	1	6								1														
Dropephylla ioptera (Steph.)	TT																2																		
Dropephylla vilis (Er.)	TT																18																		
Dropephylla spp.	TT																																		1
Omalium rivulare (Payk.)	DU		1	3		2	1					2	15		1												5	7		2		2	1		

Table 13.3: Pit faunas, original entries, actual figures (except 25, see text). Superabundants in bold. See Fig. 6.1 for eco-codes.

Pit sample numbers		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Omalium allardi Fairm.& Bris	DF																										15							2	20	
Omalium caesum Grav.	DF		1																																	
Omalium excavatum Steph.	DC																5														1					
Omalium spp.	DU			2	2	2	1		6	3	12	1	6	2		6	3	3		2	1	3	1	3				2			4				
Xylodromus depressus (Grav.)	DX																																	1		
Xylodromus concinnus (Marsh.)	DX	2	9	1	5	3	4	1		3	8	9	15	1	3	3	10	3	4							1.2	5		9		1	3	3	6	6	2
Xylodromus spp.	DX		1						1					1	1						1		1												
Anthobium spp.	TW															1																			
Olophrum spp.	GD																		1																
Lesteva longoelytrata Goez.	GD																					1						2							
Lesteva spp.	GD						1				1	1																							
Coprophilus striatulus (F.)	DF B		1	7	18	1			1			1	1	30		6		1				2				15					10	4	1		3
Carpelimus bilineatus Steph.	DC	1	3	2	3	15	5				1	21	1	12	6	1	2					5							1		11	2		1	
Carpelimus fuliginosus (Grav.)	DC					2	1		1	16		1			6							1	2											1	
Carpelimus corticinus (Grav.)	GD																1																		
Carpelimus pusillus (Grav.)	DC	1	1				3					6		1	2		1	1				1														
Carpelimus elongatulus (Er.)	GD															1	3																			
Carpelimus spp.	UU	2				1	3	8	2	2	3			1					2	2			3	5		5.1	25	9			1					2
Anotylus rugosus (F.)	DU		1	2	4	5	7	2	1	1	2	9		21	2	3	4	1		7	4	3	1	4	6	1.3	5	10				57	4	3	1	4
Anotylus sculpturatus (Grav.)	DF	1			4			1	5		3				1	1						1		1	1			2		26		3			1
Anotylus nitidulus (Grav.)	DU			2	2	2	14	1	2		3	2	1		1	1	2	2	1	3	2	7		4				8		6	1	3			2
Anotylus complanatus (Er.)	DF				3		6	2	1	2					2	1	1	1			3	8					5		1	14		17	2	1	10
Anotylus tetracarinatus Block	DF		3	3	2		2				1	1				1				2	1		1					1	6			1		
Anotylus spp.	DU									1												1	4											
Oxytelus sculptus Grav.	DF			1		1	3		5	8	2				2	1	2	3	1			6	4	1		5.2	5		5				8		1
Platystethus arenarius (Fourc.)	DF	2	1	1		4	6	2		2	2				1		1	4	2			21	2	2	1	6.2	5	5	1						
Platystethus cornutus group	GD		1				1										1	2			1	2	3	3		1.3				1			2	1	1
Platystethus nitens (Sahl.)	GD		1					1			1						3					1	1	3		0.7				1		1	1		
Platystethus spp.	UU																				1									1					
Stenus spp.	UU		3		4	2			1	4	1				2		9	2	2	1		2	1	1	6	0.5		5		5	1		1		
Euaesthetus bipunctatus (Ljungh)	GD																		3																
Euaesthetus laeviusculus Mann.	GD																		2																
Paederus spp.	TT																					1			1										
Rugilus spp.	DC															1			1											1					
Lithocharis spp.	DC							3		2							1									1.2	5	1							
Lathrobium spp.	DC		1														1						1								1		1	1	
Leptacinus spp.	DC			1			1	6	3	4	1							1	1		1	1				13.4	5	10		3					
Phacophallus parumpunctatus Gyll.	DC									1																	5								
Gyrohypnus fracticornis (Müll.)	DF						2		1		1		1	1				1	1		3	1		2	1				1				1		
Gyrohypnus angustatus Steph.	DF						1				1																						3		
Gyrohypnus spp.	DF			1	1	2	1				2					1	3	1		1	1		1	1											
Xantholinus glabratus (Grav.)	DF																					1													
Xantholinus linearis (Ol.)/*longiventris* Heer	DX																											4		24			1		

Table 13.3: Pit faunas, original entries, actual figures (except 25, see text). Superabundants in bold. See Fig. 6.1 for eco-codes.

Pit sample numbers		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Xantholinini Indet.	DU																								1			2	2	11						
Atrecus affinis (Payk.)	TT																																1			
Neobisnius spp.	DC					1	3			2	2	12		7	4	1	2			1		6	2	4				4				17	1			
Philonthus politus (L.)	DF					3																										3	2	8	3	39
Philonthus cephalotes (Grav.)	DC															15																		6	2	
Philonthus splendens (F.)	DF																			1														1		
Philonthus ventralis (Grav.)	DC																																	3		
Philonthus spp.	DU			2		14	1	3	13	4	11	3	12		1	4	3	4	2	2	1	6	4	7	6	5.9	5	2	3	3	1		2	7	2	12
Creophilus maxillosus (L.)	DF						2				1		3																				2			1
Quedius mesomelinus (Marsh.)	DU						1																										1	2		
Quedius spp.	UU										3					3			1									2	4		1			2	1	2
Staphylininae spp. indet.	UU				5		1				2	1	1	1		1	1		2	1	5	2	1	1							1			1	
Tachyporus spp.	UU		1					1	1								1		1						1			3							
Tachinus subterraneus (L.)	DF					1			1							2																				
Tachinus signatus Grav.	DF					1													1																	
Tachinus spp.	DF				1	1					1									2							1		1	3	2		1			
Cilea silphoides (L.)	DF										1															1								1		
Cypha spp.	UU										1																									
Cordalia obscura (Grav.)	DF							3	1		1			1			1			2		1														
Cordalia spp.	DF					1					1																									
Falagria spp.	UU	1	1				1			4	2		1		1		3	1	2	1		3	1	2		0.9		1								
Aleochara spp.	DF					4			15		3															0.8	5						1	2		
Aleocharinae gen. indet.	UU	1	17	3	36	25	30	2	6	8	22	5	25	9	5	15	27	8	10	16	8	13	6	6	1		15	25	3	15	10	10	7	11	4	
Euplectus spp.	GD		1		15		4	3				3		6	1	2											1								
Bryaxis spp.	GD																																			1
Pselaphidae spp. indet.	GD		3	1	9	1	5	1			1	1		7					1			1			1		5								
Malthodes marginatus (Latr.)	UU																1																		
Anthocomus fasciatus (L.)	UU								1																											
Necrobia spp.	DX N																1																		
Agrypnus murinus (L.)	GP V																															1				
Elateridae spp. indet.	UU	1	1		1		1									1				1		1														
Cyphon spp.	GD V		1							1	2				1																					
Scirtidae indet.	GD V																	1										2								
Dryops spp.	AA																								1										
Dermestes spp.	DX N											1			1		2							1												
Attagenus pellio (L.)	DX N												1			2																				
Anthrenus spp.	DX N												1			1																				
Kateretes rufilabris (Latr.)	GD V		3														1																			
Brachypterus spp.	GA V		1																												1					
Meligethes spp.	UU		2		1								1		2		1	1	1	1		1		1								1				
Epuraea spp.	UU												1																							
Omosita spp.	DX N					1					2			1			1	3				2	2	1					2	1		1		2		2
Nitidula spp.	DX N																																	1		1

Table 13.3: Pit faunas, original entries, actual figures (except 25, see text). Superabundants in bold. See Fig. 6.1 for eco-codes.

Pit sample numbers		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Rhizophagus parallelocollis Gyll	DF B			17	18									12	1	1											15					19	2			
Rhizophagus spp.	UU		3									1															5									
Monotoma spinicollis Aube	DX M									1																1.3	5		1						
Monotoma picipes Hbst.	DX M																						2			8.8	5								
Monotoma brevicollis Aube	DX M																										5									
Monotoma bicolor Villa	DX M																										15		1							
Monotoma longicollis Gyll.	DX M							8															2			2.1										
Monotoma spp.	DX M							1	3										1											1						
Oryzaephilus surinamensis (L.)	FG	5	12		2		2					9	6	3	2	6			56	6						2								1		
Pediacus spp.	TT																											1								
Cryptolestes ferrugineus (Steph.)	FG	5	12		1														46	5																
Cryptophagus spp.	DX M	2	8	2	3	10	3	2	5	6	4	16	11		5	8	26	4	36	1	4	1	5	6	1	2.8	15	2	3	3	4	5	8	22	7	1
Atomaria spp.	DX M	1	4	1	2	6	1	1	2	7	7	3	7		4	6	7	1	6		1	2	7	6	1	1.3	5		7	1	2	2	2	10	6	5
Ephistemus globulus (Payk.)	DC M																						1									1	3			
Phalacrus spp.	GA V																				1				6											
Stephostethus angusticollis (Gyll)	DX								1																											
Lathridius minutus group	HM M	3	25	2	7	12	12	3	6	7	4	21	15	4	15	15	22	4	26	2	42	6	3	4		0.9	15	2	0			6	7	9	6	
Enicmus spp.	DX M		7					2	3				2		1		2		1				1													6
Dienerella spp.	DX M	2	1								1		1		1						1			1			5		3							
Corticaria serrata (Payk.)	DX M																77												9			1				
Corticaria spp.	DX M	1	2		3		2		2	1			2			3	31		2		5	1	3	5				3				6				
Corticarina spp.	DX M		1	1				2										2		1			2			2.4	1			5	2		1	1	2	
Typhaea stercorea (L.)	HM M																		7							3.3	15			1					1	
Aglenus brunneus (Gyll.)	HH B		2	1		1	1	1		3		1	6					1				1		1			5		28					8	8	
Anommatus duodecimstriatus Mul	DU B																										5								
Mycetaea hirta (Marsh.)	DX M					2	1	1	2	6	12	3	15	1	1	6	6							2			15	11	13			1	32	9	7
Lyctus linearis (Goez.)	HT			2	3	2										2									1		2							1
Lyctus spp.	HT										1						1									1.3									
Grynobius planus (F.)	TT																																1			
Xestobium rufovillosum (Deg.)	HT																										1									
Stegobium paniceum (L.)	HH		1																																	
Anobium punctatum (Deg.)	HT	10	28	1	4	3	4	5	4	5	8	6	15	4	3	15		1	4	1	1	4	3	3	1	8.3	25	9	6	1	3	1	6	5	3	14
Ptilinus pectinicornis (L.)	HT		1				1																												2	
Tipnus unicolor (Pill.)	HM M	1	10					1	3	5	12	8	15	6	6	15			2								15							2		
Ptinus fur (L.)	HM M	1	8		1	1	2				3	2	3		1	3	5					2							10		1	1	1	2	2	8
Ptinus spp.	HM M				1	2			2	3	1							2	1	1	1		1	1		1	5	2								
Rhinosimus planirostris (F.)	TT																					1						1								
Anthicus florelis/formicarius (L.)	DX	2					1												1				1			22	5								1
Anthicus spp.	DU	1						3	2	2																0.7									
Blaps spp.	HH					1	1						1																3							1
Palorus ratzeburgi (Wiss.)	FG	2	3																6								1									
Tenebrio obscurus F.	FF		1			1							1			1						1		1				1							
Trox scaber (L.)	DX N					2	2															1	1	1					2						1

Table 13.3: Pit faunas, original entries, actual figures (except 25, see text). Superabundants in bold. See Fig. 6.1 for eco-codes.

Pit sample numbers		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
Geotrupes spp.	GP																			1		1								1						
Oxyomus sylvestris (Scop.)	DU			1			1										1					2		1			1						3	1		1
Aphodius prodromus (Brahm)	DF																															1				
Aphodius granarius (L.)	DF						1				3													2									2	1	1		
Aphodius spp.	GP	2	4	1	2	3	5	1	1	1	2	1		1	1	1	3	2	3	8		2	3	2	1	6.1	1	5		1	1	1	2		1	6
Phyllopertha horticola (L.)	GP V																			2																
Gracilia minuta (F.)	HT																												2			1				2
Phymatodes alni (L.)	TT																2					2														
Hesperophanes fasciculatus Fald	UU																									1.3										
Donacia spp.	AA V																		1									1								
Oulema spp.	UU V																1																			
Phaedon spp.	UU V																					1														
Hydrothassa spp.	GD V																											1								
Prasocuris phellandrii (L.)	AA V																								1			2								
Phyllotreta nemorum (L.)	GA V		1	1																			1	2							1					
Phyllotreta consobrina (Curt.)	GA V																																	1		
Phyllotreta spp.	GA V																1					1		1			1	3			7					2
Longitarsus spp.	UU V																																1			1
Chaetocnema concinna (Marsh.)	GA V																1								1					2						
Chaetocnema aridula (Gyll.)	GA V	1	1				1																					3					1			1
Chaetocnema spp.	UU V																																			1
Psylliodes spp.	GA V																													1						
Halticinae spp. indet.	UU V						1			1	1	1	1	1	1	1	2																			
Chrysomelidae indet.	UU V					2												1	2				1		1											
Bruchus spp.	FL								2		2	1	1								2	3	1	1	1					5	1	4	1		
Scolytus spp.	TT												1				1														1				
Apion spp.	UU V		1				2	1	1			1	1		1		2	2	1	1		1		1	3	2		8	1	1	1					
Phyllobius spp.	UU V																1																			1
Sitona spp.	UU V				1		1		1		1	1			1									1	1	0.5			1	2						
Tanysphyrus lemnae (Payk.)	AS V																						1		6											
Notaris acridulus (L.)	AA V																1		1			1		1	1			1								
Curculio spp.	UU V																			1																
Hypera spp.	UU V							1				1			1																					1
Sitophilus granarius (L.)	FG	2	5					1			4	5	6	3	1	1			6																	
Phytobius spp.	UU V																1																			
Cidnorhinus quadrimaculatus (L.)	GA V											1																								
Ceutorhynchinae indet.	UU V		1		2			1	1		1						1		1				1				1				1					1
Gymnetron spp.	UU V	1	4																																	
Curculionidae indet.	UU V	1	5			1	3			1		2					2		1		1	2		4	1					2						
Total nos.		74	238	72	193	185	217	98	150	151	205	179	224	151	105	192	410	80	293	101	117	199	99	121	95	157	383	194	142	99	123	177	113	238	112	161

Table 13.4: Pit faunas. Names of taxa, used in CANOCO analysis

Nse = Not specified elsewhere or unspecified

Taxonomic name	**CANOCO name**
Clivina spp.	Clivina
Trechus micros (Hbst.)	Tre mic
Trechus obtusus/4-striatus	Tre qua
Bembidion spp.	Bembidi
Pterostichus spp.	Pterost
Pterostichus melanarius (Ill.)	Pte mel
Harpalus spp.	Harpalu
Amara spp.	Amara
Laemostenus terricola (Hbst.)	Lae ter
Carabidae spp. nse	Carabid
Hydroporus spp.	Dytiscd
Hydraenidae sp. nse)	Hydraed
Helophorus spp.	Helopho
Sphaeridium spp.	Sphaeri
Cercyon spp nse.	Cercyon
Cercyon haemorrhoidalis (F.)	Ce foul
Cercyon melanocephalus (L.)	Ce foul
Cercyon unipunctatus (L.)	Ce foul
Cercyon atricapillus (Marsh)	Ce foul
Cercyon terminatus (Marsh.)	Ce foul
Cercyon pygmaeus (Ill.)	Ce foul
Cercyon analis (Payk.)	Cer ana
Megasternum obscurum (Marsh.)	Meg obs
Cryptopleurum minutum (F.)	Crp min
Hydrophilinae spp. nse	Hydrfin
Acritus nigricornis (Hoff.)	Acr nig
Dendrophilus spp.	Dendrop
Histeridae spp. nse	Histid
Silpha spp.	Silpha
Catops/Choleva spp.	Catops
Clambidae nse	Clambus
Scydmaenidae nse	Scydmid
Orthoperus spp.	Orthope
Ptenidium spp.	Ptenidi
Acrotrichis spp.	Acrotri
Ptiliidae nse	Ptiliid
Micropeplus fulvus Er.	Mic ful
Lesteva spp.	Lesteva
Megarthus spp.	Megarth
Proteinus spp.	Protein
Phyllodrepa spp.	Phyllod
Dropephylla vilis (Er.)	Dro vil
Omalium spp. nse	Omalium
Omalium rivulare (Payk.)	Oma riv
Omalium allardi Fairm.& Bris	Oma all
Xylodromus concinnus (Marsh.)	Xyl con

Xylodromus spp.	Xylodro
Coprophilus striatulus (F.)	Cop str
Carpelimus bilineatus Steph.	Car bil
Carpelimus fuliginosus (Grav.)	Car ful
Carpelimus pusillus (Grav.)	Car pus
Carpelimus spp. nse	Carpeli
Anotylus rugosus (F.)	Ano rug
Anotylus sculpturatus (Grav.)	Ano scu
Anotylus nitidulus (Grav.)	Ano nit
Anotylus complanatus (Er.)	Ano com
Anotylus tetracarinatus Block	Ano tet
Anotylus spp. nse	Anotylu
Oxytelus sculptus Grav.	Oxy scu
Platystethus arenarius (Fourc.)	Pla are
Platystethus cornutus group	Pla cor
Platystethus nitens (Sahl.)	Pla nit
Euaesthetus spp.	Euaesth
Stenus spp.	Stenus
Paederinae spp. nse	Pederin
Leptacinus spp.	Leptacn
Gyrohypnus fracticornis (Müll.)	Gyr fra
Gyrohypnus spp.	Gyrohyp
Xantholinus linearis (Ol.)/*longiventris* Heer	Xan lin
Xantholinini spp. nse	Xanthol
Neobisnius spp.	Neobisn
Philonthus spp. nse	Philont
Philonthus politus (L.)	Phi pol
Philonthus cephalotes (Grav.)	Phi cep
Creophilus maxillosus (L.)	Cre max
Quedius mesomelinus (Marsh.)	Que mes
Quedius spp.	Quedius
Staphylininae spp. nse	Staphin
Tachyporus spp.	Tachypo
Tachinus spp.	Tachinu
Falagria spp.	Falagri
Aleochara spp.	Aleocha
Aleocharinae gen. nse	Aleocin
Euplectinae	Euplect
Pselaphidae spp. nse	Pselfid
Elateridae spp.	Elatrid
Scirtidae spp..	Scirtid
Dermestidae spp. nse	Dermesd
Meligethes spp.	Meliget
Omosita spp.	Omosita
Rhizophagus spp. nse	Rhizoph
Rhizophagus parallelocollis Gyll	Rhi par
Monotoma spp.	Monotom
Oryzaephilus surinamensis (L.)	Ory sur
Cryptolestes ferrugineus (Steph.)	Cry fer

Cryptophagus spp.	Cryptop
Atomaria spp.	Atomari
Lathridius minutus group	Lat min
Enicmus spp.	Enicmus
Ephistostemus globulus (Payk.)	Eph glo
Dienerella spp.	Dienere
Corticaria spp.	Cortica
Corticarina spp.	Cortcin
Typhaea stercorea (L.)	Typ ste
Aglenus brunneus (Gyll.)	Agl bru
Mycetaea hirta (Marsh.)	Myc hir
Lyctus linearis (Goez.)	Lyctus
Anobium punctatum (Deg.)	Ano pun
Ptilinus pectinicornis (L.)	Pti pec
Tipnus unicolor (Pill.)	Tip uni
Ptinus fur (L.)	Pti fur
Ptinus spp.	Ptinus
Anthicus spp.	Anthicu
Phymatodes alni (L.)	Phy aln
Blaps spp.	Blaps
Palorus ratzeburgi (Wiss.)	Pal rat
Tenebrio obscurus F.	Ten obs
Trox scaber (L.)	Tro sca
Geotrupes spp.	Geotrup
Oxyomus sylvestris (Scop.)	Oxy syl
Aphodius granarius (L.)	Aph gra
Aphodius spp.	Aphodiu
Gracilia minuta (F.)	Gra min
Tanysphyrus lemnae (Payk.)	Wetchry
Kateretes rufilabris (Latr.)	Wetchry
Donacia spp.	Wetchry
Phaedon spp.	Wetchry
Hydrothassa spp.	Wetchry
Prasocuris phellandrii (L.)	Wetchry
Phyllotreta spp. nse	Phyllot
Phyllotreta nemorum (L.)	Phy nem
Halticinae spp. nse	Haltcin
Chaetocnema concinna (Marsh.)	Cha con
Chrysomelidae nse	Chrymid
Bruchus spp.	Bruchus
Scolytus spp.	Scolytu
Apion spp.	Apion
Sitona spp.	Sitona
Notaris acridulus (L.)	Not acr
Hypera spp.	Hypera
Sitophilus granarius (L.)	Sit gra
Ceutorhynchinae spp. nse	Ceutrhy
Curculionidae nse	Curcid

Table 13.5: Pit faunas, final list, 34 pits, 134 taxa, used in CANOCO analysis
For sample details see Table 13.1: for list of abbreviations see Table 13.4.

P no.	Clivina	Tre qua	Tre mic	Bembidi	Pterost	Pte mel	Harpalu	Amara	Lae ter	Carabid	Dytiscd	Hydraed	Helopho	Sphaeri	Cercyon	Ce foul	Cer ana	Meg obs	Crp min	Hydrfid
1	0.00	0.00	0.00	0.00	2.74	0.00	0.00	1.37	1.37	2.74	1.37	0.00	5.48	0.00	0.00	4.11	0.00	1.37	0.00	0.00
2	0.00	0.85	0.43	0.85	0.43	0.43	0.00	0.00	0.00	1.71	0.85	0.85	2.14	0.00	0.43	0.00	0.85	0.43	0.43	0.00
3	0.00	0.00	3.33	0.00	0.00	0.00	0.00	0.00	0.00	3.33	0.00	0.00	0.00	0.00	1.67	0.00	6.67	0.00	0.00	0.00
4	0.00	0.00	4.69	0.52	0.00	1.04	0.00	0.00	0.00	0.52	0.00	0.00	0.00	0.00	2.08	1.04	1.04	0.00	0.00	0.00
5	0.00	1.63	2.17	0.00	0.00	0.00	0.54	0.00	0.00	0.54	0.00	0.00	1.09	0.00	0.00	1.63	7.07	0.00	0.00	0.00
6	0.00	1.52	0.51	0.51	0.51	0.51	0.00	0.00	0.00	3.03	0.00	0.00	1.52	0.00	0.51	1.01	6.57	0.51	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.02	0.00	0.00	1.02	0.00	1.02	0.00	2.04	0.00	0.00	0.00
8	0.00	0.00	0.69	0.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.69	0.00	1.39	2.08	2.08	0.00	0.00	0.00
9	0.00	0.00	0.68	0.00	0.00	0.00	0.00	0.68	0.00	0.00	0.00	0.00	0.00	0.00	2.72	0.68	4.76	0.00	0.68	0.00
10	0.00	0.00	0.95	0.00	0.00	0.00	0.00	0.00	0 00	0.95	0.00	0.48	0.48	0.00	4.76	0.48	0.00	0.00	0.48	0.00
11	0.00	0.00	0.75	0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.75	0.00	0.75	3.80	2.26	0.75	0.00	0.00
12	0.00	0.00	0.45	0.00	0.00	0.00	0.00	0.00	0.90	0.45	0.00	0.00	0.45	0.00	1.35	0.90	0.90	0.00	0.00	0.00
13	0.00	0.79	7.09	0.00	0.00	0.00	0.00	0.00	0 00	0.00	0.00	0.00	0.00	0.00	0.79	0.00	0.00	0.00	0.00	0.79
14	0.00	0.99	0.00	0.00	0.00	0.00	0.00	0.00	0 00	0.00	0.00	0.00	2.97	0.00	0.00	0.99	0.99	0.00	0.00	0.00
15	0.00	0.54	0.00	0.54	0.54	0.00	0.00	0.00	0.00	0.54	0.00	0.54	0.54	0.00	0.00	0.00	1.08	0.54	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.88	0.00	0.00	1.18	0.00	0.00	0.00	1.47	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.75	2.50	6.25	0.00	1.25	0.00
18	0.00	0.41	0.00	0.00	0.00	0.00	0.00	0.41	0.00	0.83	0.41	0.00	1.24	0.00	0.00	0.41	6.64	1.24	0.00	1.66
19	0.00	0.00	0.00	1.00	2.00	0.00	0.00	0.00	0.00	4.00	0.00	0.00	6.00	0.00	1.00	2.00	1.00	3.00	0.00	1.00
20	0.00	0.00	0.00	0.00	2.38	0.00	1.19	0.00	0.00	0.00	0.00	1.19	1.19	0.00	1.19	0.00	10.71	0.00	0.00	0.00
21	0.52	0.00	0.00	0.52	0.00	0.00	0.00	0.00	0.00	1.56	0.52	0.52	1.04	0.00	1.56	14.58	2.60	0.00	0.00	0.00
22	0.00	0.00	0.00	2.06	0.00	0.00	1.03	0.00	0.00	1.03	0.00	1.03	1.03	1.03	1.03	6.19	2.06	0.00	0.00	0.00
23	0.93	0.00	0.00	0.00	0.93	0.00	0.00	0.00	0.00	0.93	0.00	0.93	1.87	0.00	2.80	0.93	0.93	0.00	0.00	0.00
25	0.00	0.00	0.00	0.34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.68	0.95	21.16	0.00	0.00	0.00	0.95	0.00
26	0.00	0.00	4.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.82	4.23	0.00	0.00	0.00	0.00
27	0.00	0.52	0.00	0.52	0.00	0.00	0.00	0.00	0.00	1.04	0.52	0.52	2.07	0.00	5.70	0.00	0.00	0.00	0.00	0.52
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.76	0.00	0.00	0.76	0.00	0.00	0.00	0.00	0.76	0.00	0.00	0.00
29	1.30	0.00	0.00	0.00	0.00	0.00	0.00	1.30	0.00	0.00	0.00	0.00	3.90	0.00	1.30	0.00	0.00	1.30	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	4.00	1.00	1.00	0.00	0.00	0.00
31	0.00	0.00	0.81	0.81	0.81	0.00	0.00	0.00	0.00	0.00	0.00	0.81	0.00	0.00	1.63	0.81	0.00	0.00	0.00	0.00
32	0.00	0.00	0.93	0.00	0.00	0.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.87	1.87	0.00	0.00	0.00	0.00
33	0.45	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.86	0.00	0.00	0.00
34	0.98	0.00	0.98	0.00	0.98	0.98	0.00	0.00	0.98	0.00	0.00	0.00	0.98	0.00	1.96	0.00	1.96	0.00	0.00	0.00
35	0.75	0.75	0.00	0.00	0.00	0.00	0.75	0.00	0.00	0.00	0.00	0.75	0.00	0.00	6.72	0.00	0.00	0.00	0.00	0.00

Table 13.5: Pit faunas, final list, 34 pits, 134 taxa, used in CANOCO analysis
For sample details see Table 13.1: for list of abbreviations see Table 13.4.

P no.	Acr nig	Dendrop	Histid	Silpha	Catops	Clambus	Scydmid	Orthope	Ptenidi	Acrotri	Ptiliid	Mic ful	Lesteva	Protein	Megarth	Phyllod	Dro vil	Omalium	Oma riv	Oma all
1	2.74	0.00	0.00	0.00	0.00	0.00	1.37	0.00	1.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.43	0.00	0.00	0.00	0.00	0.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.43	0.43	0.00
3	1.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.33	5.00	0.00
4	0.52	0.00	0.00	0.00	0.00	0.52	0.00	0.00	0.00	0.00	1.56	0.00	0.00	0.00	0.00	0.00	0.00	1.04	0.00	0.00
5	0.00	0.00	0.54	0.00	2.17	0.00	0.54	0.00	2.17	1.09	0.00	0.00	0.00	0.00	0.00	1.09	0.00	1.09	1.09	0.00
6	1.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.05	2.02	2.50	0.00	0.51	0.00	0.00	0.00	0.00	0.51	0.51	0.00
7	6.12	0.00	0.00	0.00	0.00	1.02	0.00	1.02	8.16	2.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	1.39	0.00	0.69	0.00	0.00	0.00	1.40	1.39	7.64	0.00	2.10	0.00	0.00	0.00	0.00	6.25	0.00	4.17	0.00	0.00
9	0.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.20	0.68	0.00	0.00	0.00	0.00	0.68	0.00	0.00	2.04	0.00	0.00
10	0.48	0.00	1.43	0.00	1.90	0.48	0.00	0.48	3.33	0.48	0.00	0.00	0.48	0.00	0.00	0.48	0.00	0.00	5.71	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.75	0.00	0.75	0.00	0.00	0.75	0.00	0.75	1.50	0.00
12	0.00	0.00	1.35	0.00	0.00	0.00	0.00	0.45	2.69	0.00	0.00	0.00	0.00	0.00	0.00	2.69	0.00	2.69	6.73	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.57	0.00	0.00
14	1.98	0.00	0.00	0.00	0.00	0.00	2.97	0.00	0.00	0.99	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.99	0.00
15	0.00	0.00	8.10	0.00	0.54	0.00	1.08	0.00	8.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.24	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	5.00	0.00	10.29	0.59	4.40	0.00	0.00	0.00	0.00	0.59	0.00	5.29	2.35	0.00	0.00
17	0.00	0.00	1.25	0.00	0.00	0.00	0.00	2.50	1.25	1.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.75	0.00	0.00
18	0.41	0.00	0.00	0.00	0.00	1.24	0.83	0.00	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	2.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	2.38	0.00	1.19	0.00	0.00	0.00	8.33	0.00	0.00	0.00	1.19	0.00	1.19	0.00	0.00
21	0.52	0.00	0.52	0.52	0.52	0.00	0.52	0.52	2.08	2.08	0.00	0.00	0.52	0.00	0.00	0.00	0.00	1.56	0.00	0.00
22	2.06	0.00	0.00	0.00	0.00	1.03	0.00	0.00	1.03	0.00	0.00	0.00	0.00	1.03	1.03	0.00	0.00	1.03	0.00	0.00
23	0.93	0.00	0.93	0.00	0.00	0.00	0.00	0.00	5.61	0.00	0.00	0.93	0.00	0.93	0.93	0.00	0.00	2.80	0.00	0.00
25	2.24	0.00	3.50	0.00	0.00	0.00	0.00	0.00	0.00	0.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	1.41	0.00	0.00	0.00	0.00	0.00	1.41	0.00	0.00	0.00	0.00	0.00	1.41	0.00	0.00	0.00	1.41	4.23
27	0.00	0.00	0.00	0.52	0.52	0.00	0.00	0.00	0.00	0.00	1.55	0.00	1.04	0.00	0.00	0.00	0.00	1.04	3.63	0.00
28	2.27	4.55	0.00	0.00	1.52	0.00	0.00	0.00	3.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	1.30	0.00	2.60	0.00	0.00	0.00	1.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	3.00	1.00	0.00	3.00	0.00	1.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	1.00	2.00	0.00
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.25	0.00	0.00
32	0.93	0.00	0.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.93	0.00	0.00	0.00	0.00	0.00	0.00	1.87	0.00
33	0.45	0.00	0.00	0.00	0.90	0.00	0.00	0.00	10.86	0.00	0.00	0.00	0.00	0.00	0.00	2.26	0.00	0.00	0.45	0.90
34	0.00	0.98	1.96	0.00	0.00	0.00	0.98	0.00	3.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.78
35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 13.5: Pit faunas, final list, 34 pits, 134 taxa, used in CANOCO analysis
For sample details see Table 13.1: for list of abbreviations see Table 13.4.

P no.	Xyl con	Xylodro	Cop str	Car bil	Car ful	Car pus	Carpeli	Ano rug	Ano scu	Ano nit	Ano com	Ano tet	Anotylu	Oxy scu	Pla are	Pla cor	Pla nit	Euaesth	Stenus	Pederin
1	2.74	0.00	0.00	1.37	0.00	1.37	2.74	0.00	1.37	0.00	0.00	0.00	0.00	0.00	2.74	0.00	0.00	0.00	0.00	0.00
2	3.85	0.43	0.43	1.28	0.00	0.43	0.00	0.43	0.00	0.00	0.00	1.28	0.00	0.00	0.43	0.43	0.43	0.00	1.28	0.43
3	1.67	0.00	10.00	3.33	0.00	0.00	0.00	3.33	0.00	3.33	0.00	5.00	0.00	1.67	1.67	0.00	0.00	0.00	0.00	0.00
4	2.60	0.00	9.38	1.56	0.00	0.00	0.00	2.08	2.08	1.04	1.56	1.04	0.00	0.00	0.00	0.00	0.00	0.00	2.08	0.00
5	1.63	0.00	0.54	8.15	1.09	0.00	0.54	2.72	0.00	1.09	0.00	0.00	0.00	0.54	2.17	0.00	0.00	0.00	1.09	0.00
6	2.02	0.00	0.00	2.53	0.51	1.52	1.52	3.54	0.00	7.07	3.03	1.01	0.00	1.52	3.03	0.51	0.00	0.00	0.00	0.00
7	1.02	0.00	0.00	0.00	0.00	0.00	8.16	2.04	1.02	1.02	2.04	0.00	0.00	0.00	2.04	0.00	1.02	0.00	0.00	3.10
8	0.00	0.69	0.69	0.00	0.69	0.00	1.40	0.69	3.47	1.39	0.69	0.00	0.00	3.47	0.00	0.00	0.00	0.00	0.69	0.00
9	2.04	0.00	0.00	0.00	10.88	0.00	1.40	0.68	0.00	0.00	1.36	0.00	0.68	5.44	1.36	0.00	0.00	0.00	2.72	0.00
10	4.29	0.00	0.00	0.48	0.00	0.00	1.43	1.43	0.48	0.95	0.00	0.48	0.00	0.95	0.95	0.00	0.48	0.00	0.48	0.00
11	6.77	0.00	0.75	9.02	0.75	4.51	0.00	3.01	0.00	1.50	0.00	0.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	6.73	0.00	0.45	0.45	0.00	0.00	0.00	0.00	0.00	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.79	0.79	10.24	9.45	0.00	0.79	0.79	10.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	2.97	0.99	0.00	5.94	5.94	1.98	0.00	1.98	0.99	0.99	1.98	0.00	0.00	1.98	0.99	0.00	0.00	0.00	1.98	0.00
15	1.62	0.00	3.24	0.54	0.00	0.00	0.54	1.62	0.54	0.54	0.54	0.54	0.00	0.54	0.00	0.00	0.00	0.00	0.00	0.54
16	2.94	0.00	0.00	0.59	0.00	0.00	1.18	1.18	0.00	0.59	0.00	0.00	0.00	0.59	0.00	0.00	0.88	0.00	2.65	0.59
17	3.75	0.00	1.25	0.00	0.00	1.25	0.00	1.25	0.00	2.50	1.25	0.00	0.00	3.75	5.00	2.50	0.00	0.00	2.50	0.00
18	1.66	0.00	0.00	0.00	0.00	0.00	0.83	0.00	0.00	0.41	0.00	0.00	0.00	0.41	0.83	0.00	0.00	2.07	0.83	0.41
19	0.00	0.00	0.00	0.00	0.00	0.00	2.00	7.00	0.00	3.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00
20	0.00	1.19	0.00	0.00	0.00	0.00	0.00	4.76	0.00	2.38	3.57	1.19	0.00	0.00	0.00	1.19	1.19	0.00	0.00	0.00
21	0.00	0.00	1.04	2.60	0.52	0.52	0.00	1.56	0.52	3.65	4.17	0.00	0.00	3.13	10.42	1.04	0.52	0.00	1.04	0.00
22	0.00	1.03	0.00	0.00	2.06	0.00	3.09	1.03	0.00	0.00	0.00	1.03	0.00	4.12	2.06	3.10	1.03	0.00	1.03	1.03
23	0.00	0.00	0.00	0.00	0.00	0.00	2.80	3.74	0.93	3.74	0.00	0.00	0.00	0.93	1.87	0.00	0.00	0.00	0.93	0.00
25	0.82	0.00	0.00	0.00	0.00	0.00	3.47	0.88	0.00	0.00	0.00	0.00	0.00	3.54	4.22	0.88	0.48	0.00	0.34	0.82
26	1.41	0.00	4.23	0.00	0.00	0.00	7.04	1.41	0.00	0.00	1.41	0.00	0.00	1.41	1.41	0.00	0.00	0.00	0.00	1.41
27	0.00	0.00	0.00	0.00	0.00	0.00	4.66	5.18	1.04	4.15	0.00	0.00	2.07	0.00	2.59	0.00	0.00	0.00	2.59	0.52
28	6.82	0.00	0.00	0.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.76	0.00	3.79	0.76	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.49	1.30
30	1.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	10.00	6.00	10.00	6.00	0.00	0.00	0.00	1.00	1.00	0.00	1.00	0.00
31	2.44	0.00	8.13	8.94	0.00	0.00	0.00	10.57	0.00	0.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.81
32	2.80	0.00	3.74	1.87	0.00	0.00	0.00	3.74	2.80	2.80	10.28	0.00	0.00	0.00	0.00	0.00	0.93	0.00	0.00	0.00
33	3.17	0.00	0.45	0.00	0.00	0.00	0.00	1.36	0.00	0.00	0.90	0.45	0.00	3.62	0.00	0.90	0.45	0.00	0.45	0.45
34	5.88	0.00	0.00	0.98	0.98	0.00	0.00	0.98	0.00	0.00	0.98	0.00	0.00	0.00	0.00	0.98	0.00	0.00	0.00	0.98
35	1.49	0.00	2.24	0.00	0.00	0.00	1.49	2.99	0.75	1.49	7.46	0.00	0.00	0.75	0.00	0.75	0.00	0.00	0.00	0.00

Table 13.5: Pit faunas, final list, 34 pits, 134 taxa, used in CANOCO analysis
For sample details see Table 13.1: for list of abbreviations see Table 13.4.

P no.	Leptacn	Gyr fra	Gyrohyp	Xan lin	Xanthol	Staphin	Neobisn	Philont	Phi pol	Phi cep	Cre mex	Que mes	Quedius	Tachypo	Tachinu	Falagri	Cordali	Aleocha	Aleocin
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.37	0.00	0.00	1.37
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.43	0.00	0.43	0.00	0.00	7.26
3	1.67	0.00	1.67	0.00	0.00	0.00	0.00	3.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00
4	0.00	0.00	0.52	0.00	0.00	2.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.52	0.00	0.00	0.00	18.75
5	0.00	0.00	1.09	0.00	0.00	0.00	0.54	7.61	1.63	0.00	0.00	0.00	0.00	0.00	1.63	0.00	0.54	2.17	13.59
6	0.51	1.01	1.01	0.00	0.00	0.51	1.52	0.51	0.00	0.00	1.01	0.51	0.00	0.00	0.00	0.51	0.00	0.00	15.15
7	6.10	0.00	0.00	0.00	0.00	0.00	0.00	3.06	0.00	0.00	0.00	0.00	0.00	1.02	0.00	0.00	3.06	0.00	2.04
8	2.08	0.69	0.00	0.00	0.00	0.00	0.00	9.03	0.00	0.00	0.00	0.00	0.00	0.69	0.69	0.00	0.69	10.42	4.17
9	3.40	0.00	0.00	0.00	0.00	0.00	1.36	2.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.72	0.00	0.00	5.44
10	0.48	0.48	1.43	0.00	0.00	0.95	0.95	5.24	0.00	0 00	0.48	0.00	1.43	0.00	0.48	0.95	0.95	1.43	10.95
11	0.00	0.00	0.00	0.00	0.00	0.75	9.02	2.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.76
12	0.00	0.45	0.00	0.00	0.00	0.45	0.00	5.38	0.00	0.00	1.35	0.00	0.00	0.00	0.00	0.45	0.00	0.00	11.21
13	0.00	0.79	0.00	0.00	0.00	0.79	5.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.79	0.00	7.09
14	0.00	0.00	0.00	0.00	0.00	0.00	3.96	0.99	0.00	0.00	0.00	0.00	0.00	0 00	0.00	0.99	0.00	0.00	4.95
15	0.00	0.00	0.54	0.00	0.00	0.54	0.54	2.16	0.00	8.11	0.00	0.00	1.62	0.00	1.08	0.00	0.00	0.00	8.11
16	0.00	0.00	0.88	0.00	0.00	0.00	0.59	0.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.88	0.00	0.00	7.94
17	1.25	1.25	1.25	0.00	0.00	0.00	0.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.25	0.00	0.00	10.00
18	0.41	0.41	0.00	0.00	0.00	0.83	0.00	0.83	0.00	0.00	0.00	0.00	0.41	0.41	0.41	0.83	0.00	0.00	4.15
19	0.00	0.00	1.00	0.00	0.00	1.00	1.00	3.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	1.00	2.00	0.00	16.00
20	1.19	3.57	1.19	0.00	0.00	5.95	0.00	1.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.52
21	0.52	0.52	0.00	0.00	0.52	1.04	3.13	3.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.56	0.52	0.00	6.77
22	0.00	0.00	1.03	0.00	0.00	1.03	2.06	4.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.03	0.00	0.00	6.19
23	0.00	1.87	0.93	0.00	0.00	0.93	3.74	3.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.87	0.00	0.00	5.61
25	9.12	0.00	0.00	0.00	0.00	0.00	0.00	4.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.61	0.00	0.54	0.00
26	2.82	0.00	0.00	0.00	0.00	0.00	0.00	1.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.41	4.23
27	5.18	0.00	0.00	2.07	1.04	0.00	2.07	1.04	0.00	0.00	0.00	0.00	1.04	1.55	0.00	0.52	0.00	0.00	12.95
28	0.00	0.76	0.00	0.00	1.52	0.00	0.00	2.27	0.00	0.00	0.00	0.00	3.03	0.00	0.76	0.00	0.00	0.00	2.27
29	3.90	0.00	0.00	26.00	0.00	0.00	0.00	3.90	0.00	0.00	0.00	0.00	0.00	0.00	3.90	0.00	0.00	0.00	19.48
30	0.00	0.00	0.00	0.00	0.00	1.00	0.00	1.00	0.00	0.00	0.00	0.00	1.00	0.00	2.00	0.00	0.00	0.00	10.00
31	0.00	0.00	0.00	0.00	0.00	0.00	10.57	0.00	2.44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.13
32	0.00	0.00	2.80	0.93	0.00	0.00	0.93	1.87	1.87	0.00	1.87	0.93	0.00	0.00	0.93	0.00	0.00	0.93	6.54
33	0.00	0.45	0.00	0.00	0.00	0.00	0.00	4.98	3.62	2.71	0.00	0.90	0.90	0.00	0.00	0.00	0.00	0.90	4.98
34	0.00	0.00	0.00	0.00	0.00	0.98	0.00	1.96	2.94	1.96	0.00	0.00	0.98	0.00	0.00	0.00	0.00	0.00	3.92
35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.94	8.96	0.00	0.75	0.00	1.49	0.00	0.00	0.00	0.00	0.00	0.00

Table 13.5: Pit faunas, final list, 34 pits, 134 taxa, used in CANOCO analysis
For sample details see Table 13.1: for list of abbreviations see Table 13.4.

Pno.	Euplect	Pselfid	Elatrid	Scirtid	Dermest	Meliget	Omosita	Rhizoph	Rhi par	Monotom	Ory sur	Cry fer	Cryptop	Atomari	Lat min	Enicmus	Eph glo	Dienere	Cortica	Cortcin
1	0.00	0.00	1.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.85	6.85	2.74	1.37	4.11	0.00	0.00	2.74	1.37	0.00
2	0.43	1.30	0.43	0.43	0.00	0.85	0.00	1.28	0.00	0.00	5.13	5.13	3.42	1.71	10.68	2.99	0.00	0.43	0.85	0.43
3	0.00	1.67	0.00	0.00	0.00	0.00	0.00	0.00	10.00	0.00	0.00	0.00	3.33	1.67	3.33	0.00	0.00	0.00	0.00	1.67
4	7.81	4.69	0.52	0.00	0.00	0.52	0.00	0.00	9.38	0.00	1.04	0.52	1.56	1.04	3.65	0.00	0.00	0.00	1.56	0.00
5	0.00	0.54	0.00	0.00	0.00	0.00	0.54	0.00	0.00	0.00	0.00	0.00	5.43	3.26	6.52	0.00	0.00	0.00	0.00	0.00
6	2.02	2.53	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.01	0.00	1.52	0.51	6.06	0.00	0.00	0.00	1.01	0.00
7	3.06	1.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.18	0.00	0.00	2.04	1.02	3.06	2.04	0.00	0.00	0.00	2.04
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.10	0.00	0.00	3.47	1.39	4.17	2.08	0.00	0.00	1.39	0.00
9	0.00	0.00	0.00	0.68	0.00	0.00	0.00	0.00	0.00	0.68	0.00	0.00	4.08	4.76	4.76	0.00	0.00	0.00	0.00	0.68
10	0.00	0.48	0.00	0.95	0.00	0.00	0.95	0.00	0.00	0.00	1.90	0.00	3.81	3.33	1.90	0.00	0.00	0.48	0.00	0.00
11	2.26	0.75	0.00	0.00	0.75	0.00	0.00	0.75	0.00	0.00	6.77	0.00	12.03	2.26	9.02	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.90	0.45	0.00	0.00	0.00	0.00	2.69	0.00	4.93	3.14	6.73	0.90	0.00	0.45	0.90	0.00
13	4.72	5.51	0.00	0.00	0.00	0.00	0.79	0.00	9.45	0.00	2.36	0.00	0.00	0.00	3.15	0.00	0.00	0.00	0.00	0.00
14	0.99	0.00	0.00	0.99	0.99	1.98	0.00	0.00	0.99	0.00	1.98	0.00	4.95	3.96	10.89	0.99	0.00	0.99	0.00	0.00
15	1.08	0.00	0.54	0.00	1.62	0.00	0.00	0.00	0.54	0.00	3.24	0.00	4.32	3.24	8.11	0.00	0.00	0.00	1.62	0.00
16	0.00	0.00	0.00	0.00	0.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.65	2.06	6.47	0.59	0.00	0.00	19.41	0.00
17	0.00	0.00	0.00	1.25	0.00	1.25	3.75	0.00	0.00	0.00	0.00	0.00	5.00	1.25	5.00	0.00	0.00	0.00	0.00	2.50
18	0.00	0.41	0.00	0.00	0.00	0.41	0.00	0.00	0.00	0.41	10.79	10.79	14.94	2.49	10.79	0.41	0.00	0.00	0.83	0.00
19	0.00	0.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	6.00	5.00	1.00	0.00	2.00	0.00	0.00	0.00	0.00	1.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.76	1.19	4.80	0.00	0.00	1.19	5.95	0.00
21	0.00	0.52	0.52	0.00	0.00	0.52	1.04	0.00	0.00	0.00	0.00	0.00	0.52	1.04	3.13	0.00	0.00	0.00	0.52	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	2.06	0.00	0.00	4.12	0.00	0.00	5.20	7.22	3.09	1.03	1.03	0.00	3.09	2.06
23	0.00	0.00	0.00	0.00	0.93	0.93	0.93	0.00	0.00	0.00	0.00	0.00	5.61	5.61	3.74	0.00	0.00	0.93	4.67	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.30	1.36	0.00	1.90	0.88	0.61	0.00	0.00	0.00	0.00	1.63
26	0.00	1.41	0.00	0.00	0.00	0.00	0.00	1.41	4.23	8.45	0.00	0.00	4.23	1.41	4.23	0.00	0.00	1.41	0.00	0.00
27	0.00	0.00	0.00	1.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.04	0.00	1.04	0.00	0.00	0.00	1.55	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	1.52	0.00	0.00	1.52	0.00	0.00	2.27	5.30	3.03	0.00	0.00	2.27	6.82	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	1.30	0.00	0.00	1.30	0.00	0.00	1.30	1.30	0.00	0.00	0.00	0.00	0.00	5.19
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.00	2.00	0.00	0.00	0.00	0.00	0.00	2.00
31	0.00	0.00	0.81	0.00	0.00	0.81	0.81	0.00	10.57	0.00	0.00	0.00	4.07	1.63	4.88	0.00	0.81	0.00	5.69	0.00
32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.87	0.00	0.00	0.00	7.48	1.87	6.54	0.00	2.80	0.00	0.00	0.93
33	0.00	0.00	0.00	0.00	0.00	0.00	0.90	0.00	0.00	0.00	0.45	0.00	9.95	4.52	4.07	0.00	0.00	0.00	0.00	0.45
34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.86	5.88	5.88	0.00	0.00	0.00	0.00	1.96
35	0.00	0.75	0.00	0.00	0.00	0.00	1.49	0.00	0.00	0.00	0.00	0.00	0.75	3.73	0.00	0.00	0.00	0.00	0.00	0.00

Table 13.5: Pit faunas, final list, 34 pits, 134 taxa, used in CANOCO analysis
For sample details see Table 13.1: for list of abbreviations see Table 13.4.

P no.	Typ ste	Agl bru	Myc hir	Lyctus	Ano pun	Pti pec	Tip uni	Pti fur	Ptinus	Anthicu	Phy aln	Blaps	Pal rat	Ten obs	Tro sca	Geotrup	Oxy syl	Aph gra	Aphodiu	Gra min
1	0.00	0.00	0.00	0.00	10.96	0.00	1.37	1.37	0.00	4.11	0.00	0.00	2.74	0.00	0.00	0.00	0.00	0.00	2.74	0.00
2	0.00	0.85	0.00	0.00	10.68	0.43	4.27	3.42	0.00	0.00	0.00	0.00	1.28	0.43	0.00	0.00	0.00	0.00	1.71	0.00
3	0.00	1.67	0.00	3.33	1.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.67	0.00	1.67	0.00
4	0.00	0.00	0.00	1.56	2.08	0.00	0.00	0.52	0.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.04	0.00
5	0.00	0.54	1.09	1.09	1.63	0.00	0.00	0.54	1.09	0.00	0.00	0.54	0.00	0.54	1.09	0.00	0.00	0.00	1.63	0.00
6	0.00	0.51	0.51	0.00	2.02	0.51	0.00	1.01	0.00	0.51	0.00	0.51	0.00	0.00	1.01	0.00	0.51	0.51	2.53	0.00
7	0.00	1.02	1.02	0.00	5.10	0.00	1.02	0.00	0.00	3.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.02	0.00
8	0.00	0.00	1.39	0.00	2.78	0.00	2.08	0.00	1.39	1.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.69	0.00
9	0.00	2.04	4.08	0.00	3.40	0.00	3.40	0.00	2.04	1.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.68	0.00
10	0.00	0.00	5.71	0.48	2.86	0.00	5.71	1.43	0.48	0.00	0.00	0 00	0.00	0.00	0.00	0.00	0.00	1.43	1.43	0.00
11	0.00	0.75	1.50	0.00	4.51	0.00	6.02	1.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.75	0.00
12	0.00	2.69	6.73	0.00	6.73	0.00	6.73	1.35	0.00	0.00	0.00	0.45	0.00	0.45	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.79	0.00	3.15	0 00	4.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.79	0.00
14	0.00	0.00	0.99	0.00	2.97	0.00	5.94	0.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.99	0.00
15	0.00	0.00	3.24	1.08	8.11	0.00	8.11	1.62	0.00	0.00	0.00	0.00	0.00	0.54	0.00	0.00	0.00	0.00	0.54	0.00
16	0.00	0.00	1.76	0.00	0.00	0.00	0.00	1.47	0.00	0.00	0.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.88	0.00
17	0.00	1.25	0.00	0.00	1.25	0.00	0.00	0.00	2.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.50	0.00
18	2.90	0.00	0.00	0.00	1.66	0.00	0.83	0.00	0.41	0.41	0.00	0.00	2.49	0.00	0.00	0.00	0.00	0.00	1.24	0.00
19	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	8.00	0.00
20	0.00	0.00	0.00	0.00	1.19	0.00	0.00	0.00	1.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.52	0.00	0.00	2.08	0.00	0.00	1.04	0.00	0.00	1.04	0.00	0.00	0.52	0.52	0.52	1.04	0.00	1.04	0.00
22	0.00	0.00	0.00	0.00	3.09	0.00	0.00	0.00	1.03	1.03	0.00	0.00	0.00	0.00	1.03	0.00	0.00	0.00	3.09	0.00
23	0.00	0.93	1.87	0.00	0.93	0.00	0.00	0.00	0.93	0.00	0.00	0.00	0.00	0.93	0.93	0.00	0.93	1.87	1.87	0.00
25	2.24	0.00	0.00	0.88	5.65	0.00	0.00	0.00	0.68	11.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.15	0.00
26	4.23	1.41	4.23	0.00	7.04	0.00	4.23	0.00	1.41	1.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	5.70	1.04	4.66	0.00	0.00	0.00	1.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.59	0.00
28	0.00	10.61	9.85	0.00	4.55	0.00	0.00	7.58	0.00	0.00	0.00	2.27	0.00	0.76	1.52	0.00	0.00	0.00	0.00	1.52
29	1.30	0 00	0.00	0.00	1.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.30	0.00	0.00	1.30	0.00
30	0.00	0.00	0.00	0.00	3.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00
31	0.00	0.00	0.00	0.00	0.81	0.00	0.00	0.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.63	0.81
32	0.00	0.00	0.93	0.00	5.61	0.00	0.00	0.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.80	1.87	1.87	0.00
33	0.00	3.62	10.86	0.00	2 26	0.00	0.90	0.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.45	0.45	0.00	0.00
34	0.98	7.84	8.82	0.00	2.94	1.96	0.00	1.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.98	0.98	0.00
35	0.00	0.00	5.22	0.75	10.45	0.00	0.00	5.97	0.00	0.75	0.00	0.75	0.00	0.00	0.75	0.00	0.75	0.00	4.48	1.49

Table 13.5: Pit faunas, final list, 34 pits, 134 taxa, used in CANOCO analysis
For sample details see Table 13.1: for list of abbreviations see Table 13.4.

P no.	Wetchry	Phylltr	Phy nem	Haltcin	Cha con	Chrymid	Bruchus	Scolytu	Apion	Sitona	Not acr	Hypera	Sit gra	Ceutrhy	Curcid
1	0.00	0.00	0.00	0.00	1.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.74	0.00	2.74
2	1.28	0.00	0.43	0.00	0.43	0.00	0.00	0.00	0.43	0.00	0.00	0.00	2.14	0.43	3.85
3	0.00	0.00	1.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.52	0.00	0.00	0.00	1.04	0.00
5	0.00	0.00	0.00	0.00	0.00	1.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.54
6	0.00	0.00	0.00	0.51	0.51	0.00	0.00	0.00	1.01	0.51	0.00	0.00	0.00	0.00	1.52
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.02	0.00	0.00	1.02	1.02	1.02	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	1.39	0.00	0.69	0.69	0.00	0.00	0.00	0.69	0.00
9	0.00	0.00	0.00	0.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.68
10	0.00	0.00	0.00	0.48	0.00	0.00	0.95	0.00	0.00	0.48	0.00	0.00	1.90	0.48	0.00
11	0.00	0.00	0.00	0.75	0.00	0.00	0.75	0.00	0.75	0.75	0.00	0.75	3.80	0.00	2.26
12	0.00	0.00	0.00	0.45	0.00	0.00	0.45	0.45	0.45	0.00	0.00	0.00	2.69	0.00	0.00
13	0.00	0.00	0.00	0.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.36	0.00	0.00
14	0.00	0.00	0.00	0.99	0.00	0.00	0.00	0.00	0.99	0.99	0.00	0.99	0.99	0.00	0.00
15	0.00	0.00	0.00	0.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.54	0.00	0.00
16	0.00	0.00	0.00	0.59	0.00	0.00	0.00	0.00	0.59	0.00	0.00	0.00	0.00	0.00	0.59
17	0.00	0.00	0.00	0.00	0.00	1.25	0.00	0.00	2.50	0.00	0.00	0.00	0.00	0.00	0.00
18	0.41	0.00	0.00	0.00	0.00	0.83	0.00	0.00	0.41	0.00	0.41	0.00	2.49	0.41	0.41
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	1.00
20	0.00	0.00	0.00	0.00	0.00	0.00	2.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.19
21	1.04	0.52	0.00	0.00	0.00	0.00	1.56	0.00	0.52	0.00	0.52	0.00	0.00	0.00	1.04
22	0.00	0.00	1.03	0.00	0.00	1.03	1.03	0.00	0.00	0.00	0.00	0.00	0.00	1.03	1.03
23	0.00	0.93	1.87	0.00	0.00	0.00	0.93	0.00	0.93	0.93	0.93	0.00	0.00	0.00	3.74
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.36	0.34	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	2.59	1.55	0.00	0.00	1.55	0.00	0.00	0.00	4.15	0.00	0.52	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.76	0.76	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	1.30	2.60	0.00	0.00	0.00	1.30	3.90	0.00	0.00	0.00	0.00	0.00
30	0.00	7.00	1.00	0.00	0.00	0.00	5.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	2.00
31	0.00	0.00	0.00	0.00	0.00	0.00	0.81	0.81	0.00	0.00	0.00	0.00	0.00	0.81	0.00
32	0.00	0.00	0.00	0.93	0.93	0.00	3.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
33	0.00	0.45	0.00	0.00	0.00	0.00	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
35	0.00	1.49	0.00	0.00	0.75	0.75	0.00	0.00	0.00	0.00	0.00	0.75	0.00	0.75	0.75

Table 13.6: Pit faunas, identification of main faunal types. Showing pit colonisers and burrowers used in diagnosis. Highest percentage levels in each column coloured according to faunal type they represent.

	Pit coloniser species										Burrowing species			
S. no.	Car bil	Carpeli	Ano rug	Ano scu	Ano nit	Ano corr	Ano tet	Oxy scu	Pla are	Neobisn	Tre mic	Rhi par	Faunal type	S. no.
1	1.37	2.74	0.00	1.37	0.00	0.00	0.00	0.00	2.74	0.00	0.00	0.00	R	1
2	1.28	0.00	0.43	0.00	0.00	0.00	1.28	0.00	0.43	0.00	0.43	0.00	R	2
3	3.33	0.00	3.33	0.00	3.33	0.00	5.00	1.67	1.67	0.00	3.33	10.00	CAN+S	3
4	1.56	0.00	2.08	2.08	1.04	1.56	1.04	0.00	0.00	0.00	4.69	9.38	CAN+S	4
5	8.15	0.54	2.72	0.00	1.09	0.00	0.00	0.54	2.17	0.54	2.17	0.00	CAN	5
6	2.02	1.52	3.54	0.00	7.07	3.03	1.01	1.52	3.03	1.52	0.51	0.00	AS	6
7	0.00	8.16	2.04	1.02	1.02	2.04	0.00	0.00	2.04	0.00	0.00	0.00	U	7
8	0.00	1.39	0.69	3.47	1.39	0.69	0.00	3.47	0.00	0.00	0.69	0.00	OP, G	8
9	0.00	1.32	0.33	0.00	0.33	0.99	0.00	3.31	1.32	0.99	0.68	0.00	OP	9
10	0.48	1.43	1.43	0.48	0.95	0.00	0.48	0.95	0.95	0.95	0.95	0.00	U, G	10
11	9.02	0.00	3.01	0.00	1.50	0.00	0.75	0.00	0.00	6.77	0.75	0.00	CAN	11
12	0.45	0.00	0.00	0.00	0.45	0.00	0.00	0.00	0.00	0.00	0.45	0.00	U, G	12
13	9.45	0.79	10.24	0.00	0.00	0.00	0.00	0.00	0.00	5.51	7.09	9.45	CAN+S	13
14	5.94	0.00	1.98	0.99	0.99	1.98	0.00	1.98	0.99	3.96	0.00	0.99	CAN	14
15	0.54	0.54	1.62	0.54	0.54	0.54	0.54	0.54	0.00	0.54	0.00	0.54	U, G	15
16	0.56	1.11	1.18	0.00	0.56	0.29	0.00	0.59	0.29	0.56	0.00	0.00	U	16
17	0.00	0.00	1.25	0.00	2.50	1.25	0.00	3.75	5.00	0.00	0.00	0.00	OP	17
18	0.00	0.83	0.00	0.00	0.41	0.00	0.00	0.41	0.83	0.00	0.00	0.00	R	18
19	0.00	2.00	7.00	0.00	3.00	0.00	2.00	0.00	0.00	1.00	0.00	0.00	R	19
20	0.00	0.00	4.60	0.00	2.30	5.45	1.15	0.00	0.00	0.00	0.00	0.00	AS	20
21	2.60	0.00	1.56	0.52	3.65	4.17	0.00	3.13	10.42	3.13	0.00	0.00	OP (mixed)	21
22	0.00	3.09	1.03	0.00	0.00	0.00	1.03	4.12	2.06	2.06	0.00	0.00	OP	22
23	0.00	4.24	3.39	0.85	3.39	0.00	0.00	0.85	1.87	3.39	0.00	0.00	CAN	23
25	0.00	3.47	0.88	0.00	0.00	0.00	0.00	3.54	4.22	0.00	0.00	0.00	OP	25
26	0.00	5.99	1.38	0.00	0.00	1.38	0.00	1.38	1.38	0.00	4.23	4.23	CAN+S	26
27	0.00	4.66	5.18	1.04	4.15	0.00	0.00	0.00	2.07	2.20	0.00	0.00	CAN	27
28	0.76	0.00	0.00	0.00	0.00	0.00	0.76	3.79	0.76	0.00	0.00	0.00	OP, G	28
29	0.00	0.00	0.00	0.00	0.00	1.30	0.00	0.00	0.00	0.00	0.00	0.00	U	29
30	0.00	1.00	0.00	10.00	6.00	15.00	5.00	0.00	0.00	0.00	0.00	0.00	AS	30
31	8.94	0.00	10.57	0.00	0.81	0.00	0.00	0.00	0.00	10.57	0.81	10.57	CAN+S	31
32	1.87	0.00	3.74	2.80	2.80	10.28	0.00	0.00	0.00	0.93	0.93	1.87	AS	32
33	0.00	0.00	1.36	0.00	0.00	0.90	0.45	3.62	0.00	0.00	0.00	0.00	OP, G	33
34	0.98	0.00	0.98	0.00	0.00	0.98	0.00	0.00	0.00	0.00	0.98	0.00	U, G	34
35	0.00	1.49	2.99	0.75	1.49	7.46	0.00	0.75	0.00	0.00	0.00	0.00	AS	35

Table 13.7: Pit faunas, decomposer and strongly synanthropic species from late and post medieval privy faunas.
Figures in % of total assemblage size and compared with those on Fig. 13.9. High levels red, low levels blue.

See Table 13.4 for abbreviations of names.

Reference	Privy faunas	Oma riv	Oma all	Cop str	Car bil	Carpeli	Ano ruç	Ano scu	Ano nid	Ano com	Ano tet	Oxe scu	Pla are
Colledge & Osborne 1980	Sidbury, Worcester	0.00	0.00	2.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Osborne 1981a	Worcester	0.00	0.86	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.57	0.00
Koch 1971	Neuss, Germany	0.00	0.00	0.00	0.00	0.00	0.63	0.00	0.00	0.00	0.00	0.63	0.00
Grove this vol	Southampton	0.00	12.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grove this vol	Winchester (60)	0.35	0.00	0.70	0.35	0.00	0.35	0.00	0.00	0.35	0.35	0.00	0.00
Buckland 1994	Moray, Scotland	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	%/sample	0.06	2.28	0.60	0.06	0.00	0.16	0.00	0.00	0.06	0.06	0.20	0.00

Reference	Privy faunas	Neo vil	Philont	Quedius	Cre max	Myc hir	Tip uni	Ptinus
Colledge & Osborne 1980	Sidbury, Worcester	0.00	6.98	2.33	0.00	39.65	6.67	2.81
Osborne 1981a	Worcester	0.00	1.43	0.57	0.29	4.92	31.08	3.07
Koch 1971	Neuss, Germany	0.00	3.16	5.06	0.63	0.00	34.88	11.63
Grove this vol	Southampton	0.00	2.51	7.78	0.10	20.06	37.54	3.72
Grove this vol	Winchester (60)	0.00	1.40	0.35	0.00	3.80	1.27	2.53
Buckland 1994	Moray, Scotland	0.00	0.36	5.80	0.00	0.00	45.65	0.00
	%/sample	0.00	2.64	3.65	0.17	11.40	26.18	3.96

Table 13.8: Pit faunas, identification of G faunas, showing samples with high values for strong synanthropes and low pit colonisers. (Marked in purple).

	Strong synanthropic species					Totals	Totals Pit colonisers													
S.no.	Myc hir	Tip uni	Pti fur	Ptinus			Car bil	Car ful	Car pus	Carpeli	Ano rug	Ano scu	Ano nit	Ano con	Ano tet	Anotylu	Oxy scu	Pla are	Neobisn
1	0.00	1.37	1.37	0.00	2.74	9.59	1.37	0.00	1.37	2.74	0.00	1.37	0.00	0.00	0.00	0.00	0.00	2.74	0.00
2	0.00	4.27	3.42	0.00	7.69	3.85	1.28	0.00	0.43	0.00	0.43	0.00	0.00	0.00	1.28	0.00	0.00	0.43	0.00
3	0.00	0.00	0.00	0.00	0.00	18.33	3.33	0.00	0.00	0.00	3.33	0.00	3.33	0.00	5.00	0.00	1.67	1.67	0.00
4	0.00	0.00	0.52	0.52	1.04	9.38	1.56	0.00	0.00	0.00	2.08	2.08	1.04	1.56	1.04	0.00	0.00	0.00	0.00
5	1.09	0.00	0.54	1.09	2.72	16.85	8.15	1.09	0.00	0.54	2.72	0.00	1.09	0.00	0.00	0.00	0.54	2.17	0.54
6	0.51	0.00	1.01	0.00	1.52	26.26	2.02	0.51	1.52	1.52	3.54	0.00	7.07	3.03	1.01	0.00	1.52	3.03	1.52
7	1.02	1.02	0.00	0.00	2.04	16.33	0.00	0.00	0.00	8.16	2.04	1.02	1.02	2.04	0.00	0.00	0.00	2.04	0.00
8	1.39	2.08	0.00	1.39	4.86	11.81	1.39	0.69	0.00	0.00	0.69	3.47	1.39	0.69	0.00	0.00	3.47	0.00	0.00
9	2.65	2.98	1.66	0.00	7.28	17.55	1.32	8.61	0.00	0.00	0.33	0.00	0.33	0.99	0.00	0.33	3.31	1.32	0.99
10	5.71	5.71	1.43	0.48	13.33	8.10	0.48	0.00	0.00	1.43	1.43	0.48	0.95	0.00	0.48	0.00	0.95	0.95	0.95
11	1.50	6.02	1.50	0.00	9.02	26.32	9.02	0.75	4.51	0.00	3.01	0.00	1.50	0.00	0.75	0.00	0.00	0.00	6.77
12	6.73	6.73	1.35	0.00	14.80	0.90	0.45	0.00	0.00	0.00	0.00	0.00	0.45	0.00	0.00	0.00	0.00	0.00	0.00
13	0.79	5.51	0.00	0.00	6.30	26.77	9.45	0.00	0.79	0.79	10.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.51
14	0.99	5.94	0.99	0.00	7.92	26.73	5.94	5.94	1.98	0.00	1.98	0.99	0.99	1.98	0.00	0.00	1.98	0.99	3.96
15	3.24	8.11	1.62	0.00	12.97	5.95	0.54	0.00	0.00	0.54	1.62	0.54	0.54	0.54	0.54	0.00	0.54	0.00	0.54
16	1.76	0.00	1.47	0.00	3.24	5.42	0.56	0.00	0.28	1.11	1.18	0.00	0.56	0.29	0.00	0.00	0.59	0.29	0.56
17	0.00	0.00	0.00	2.50	2.50	15.00	0.00	0.00	1.25	0.00	1.25	0.00	2.50	1.25	0.00	0.00	3.75	5.00	0.00
18	0.00	0.83	0.00	0.41	1.24	2.49	0.00	0.00	0.00	0.83	0.00	0.00	0.41	0.00	0.00	0.00	0.41	0.83	0.00
19	0.00	0.00	0.00	1.00	1.00	15.00	0.00	0.00	0.00	2.00	7.00	0.00	3.00	0.00	2.00	0.00	0.00	0.00	1.00
20	0.00	0.00	0.00	1.15	1.15	11.49	0.00	0.00	0.00	0.00	4.60	0.00	2.30	3.45	1.15	0.00	0.00	0.00	0.00
21	0.00	0.00	1.04	0.00	1.04	27.60	0.00	0.52	0.52	0.00	1.56	0.52	3.65	4.17	0.00	0.00	3.13	10.42	3.13
22	0.00	0.00	0.00	1.03	1.03	15.46	0.00	2.06	0.00	3.09	1.03	0.00	0.00	0.00	1.03	0.00	4.12	2.06	2.06
23	1.87	0.00	0.00	0.93	2.80	17.76	0.00	0.00	0.00	2.80	3.74	0.93	3.74	0.00	0.00	0.00	0.93	1.87	3.74
25	0.00	0.00	0.00	0.68	0.68	12.11	0.00	0.00	0.00	3.47	0.88	0.00	0.00	0.00	0.00	0.00	3.54	4.22	0.00
26	3.69	3.69	0.00	1.38	8.76	11.98	0.00	0.00	0.00	5.99	1.38	0.00	0.00	1.38	0.00	0.46	1.38	1.38	0.00
27	5.70	0.00	0.00	1.04	6.74	21.76	0.00	0.00	0.00	4.66	5.18	1.04	4.15	0.00	0.00	2.07	0.00	2.59	2.07
28	9.85	0.00	7.58	0.00	17.42	6.06	0.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.76	0.00	3.79	0.76	0.00
29	0.00	0.00	0.00	0.00	0.00	1.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.30	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	1.00	0.00	1.00	33.00	0.00	0.00	0.00	1.00	0.00	10.00	6.00	10.00	6.00	0.00	0.00	0.00	0.00
31	0.00	0.00	0.81	0.00	0.81	20.33	8.94	0.00	0.00	0.00	10.57	0.00	0.81	0.00	0.00	0.00	0.00	0.00	0.00
32	0.93	0.00	0.93	0.00	1.87	22.43	1.87	0.00	0.00	0.00	3.74	2.80	2.80	10.28	0.00	0.00	0.00	0.00	0.93
33	10.86	0.90	0.90	0.00	12.67	6.33	0.00	0.00	0.00	0.00	1.36	0.00	0.00	0.90	0.45	0.00	3.62	0.00	0.00
34	8.82	0.00	1.96	0.00	10.78	3.92	0.98	0.98	0.00	0.00	0.98	0.00	0.00	0.98	0.00	0.00	0.00	0.00	0.00
35	5.22	0.00	5.97	0.00	11.19	14.93	0.00	0.00	0.00	1.49	2.99	0.75	1.49	7.46	0.00	0.00	0.75	0.00	0.00

Table 13.9: Pit faunas, table showing percentages of each taxa/faunal type.

High levels red, low levels blue, see text for details

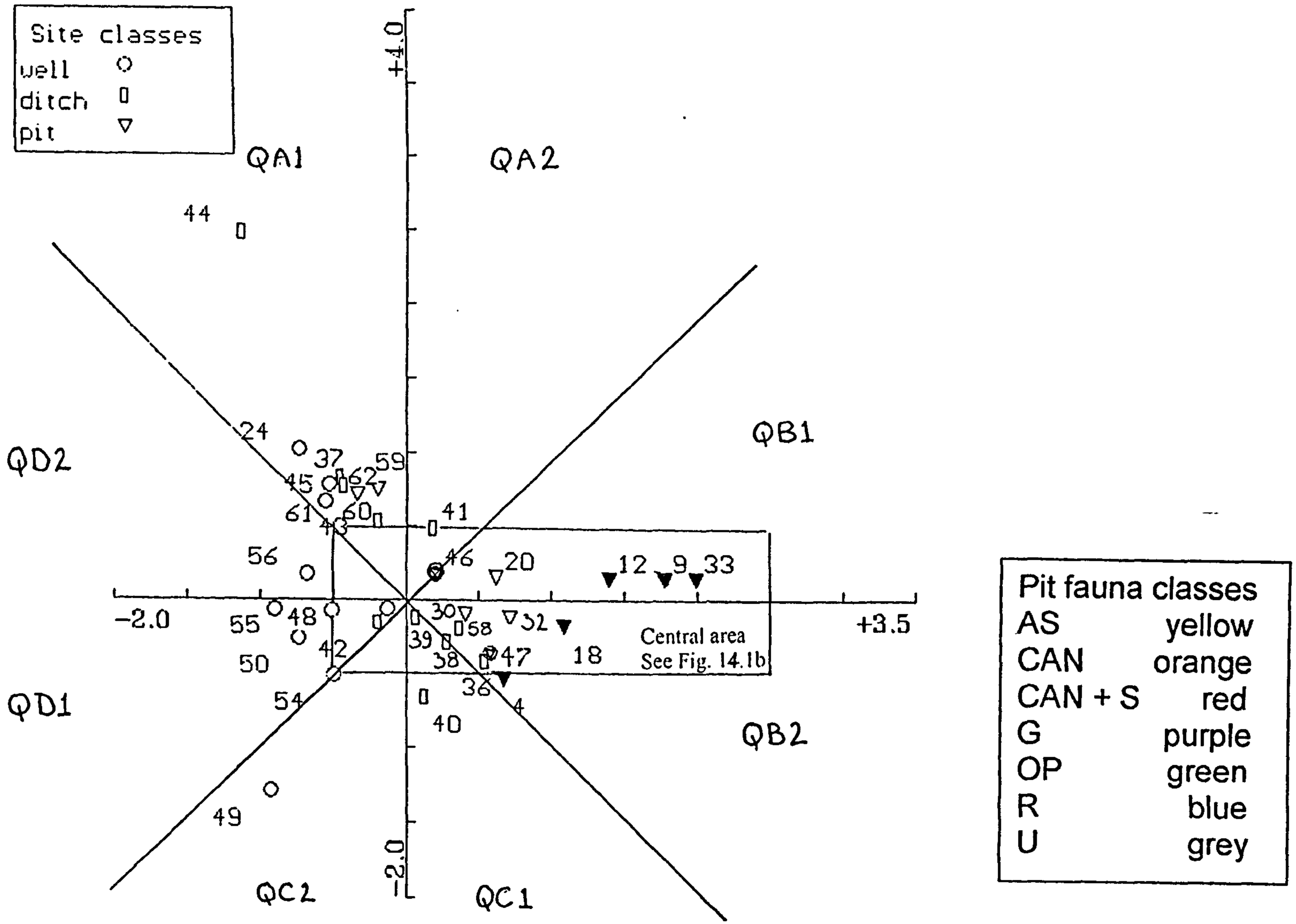
	Tre qua	Tre mic	Pterost	Carabid	Carall	Dytiscd	Helopho	Cercyon	Ce foul	Meg obs	Crp min	Hydrfid	Acr nig	Dendrop	Catops	Clambus	Scydmid	Orthope	Ptenidi
CAN	0.39	2.31	0.17	0.63	1.21	0.05	0.86	1.80	1.33	0.08	0.00	0.13	0.50	0.00	0.27	0.05	0.35	0.00	1.19
OP	0.06	0.17	0.00	0.32	1.32	0.07	0.43	3.95	3.25	0.00	0.36	0.00	1.20	0.57	0.37	0.13	0.24	0.55	4.51
AS	0.45	0.29	0.56	0.61	2.33	0.00	0.53	2.85	0.78	0.10	0.00	0.00	0.39	0.00	0.60	0.66	0.00	0.83	1.01
R	0.32	0.11	1.29	2.32	4.97	0.66	3.72	0.36	1.63	1.51	0.11	0.66	1.29	0.00	0.00	0.31	0.55	0.00	0.66
G	0.14	0.60	0.38	0.49	1.27	0.00	0.61	2.02	0.34	0.14	0.12	0.00	0.12	0.25	0.61	0.12	0.52	0.23	4.51

	Oma riv	Oma all	Cop str	Car bil	Car ful	Ano scu	Ano nit	Ano com	Ano tet	Oxy scu	Pla are	Leptacn	Gyr fra	Gyrohyp	Staphin	Neobisn	Philont	Phi pol	Phi cep
CAN	1.36	0.42	4.33	4.64	0.78	0.50	1.63	0.50	0.68	0.64	1.05	0.97	0.25	0.41	0.50	3.28	2.26	0.41	0.00
OP	0.06	0.11	0.43	0.42	1.77	0.50	0.94	1.05	0.28	3.86	2.98	2.05	0.46	0.29	0.26	0.82	4.41	0.45	0.34
AS	0.87	0.00	1.20	0.88	0.10	2.71	3.93	6.84	1.63	0.45	0.51	0.33	0.89	0.99	1.45	0.49	3.29	2.16	0.00
R	0.11	0.00	0.11	0.66	0.00	0.34	0.85	0.00	0.82	0.10	1.00	0.10	0.10	0.25	0.46	0.25	0.96	0.00	0.00
G	3.11	2.70	0.92	0.37	0.61	0.25	0.49	0.38	0.25	0.37	0.24	0.12	0.23	0.49	0.49	0.37	3.69	0.74	2.52

	Cre max	Que mes	Quedius	Falagri	Cordali	Euplect	Pselfid	Elatrid	Dermest	Omosita	Rhi par	Monotom	Ory sur	Cry fer	Dienere	Typ ste	Agl bru	Myc hir	Lyctus
CAN	0.00	0.00	0.10	0.32	0.13	1.58	1.46	0.13	0.26	0.30	4.46	0.85	0.99	0.05	0.32	0.42	0.52	1.60	0.70
OP	0.00	0.11	0.49	0.90	0.15	0.00	0.07	0.07	0.00	1.16	0.00	2.09	0.23	0.00	0.28	0.28	2.25	3.27	0.11
AS	0.73	0.29	0.50	0.10	0.00	0.40	0.65	0.10	0.00	0.30	0.37	0.00	0.20	0.00	0.23	0.00	0.10	1.33	0.15
R	0.00	0.00	0.10	0.91	0.50	0.11	0.42	0.70	0.00	0.00	0.00	0.10	7.53	6.94	0.79	0.73	0.21	0.00	0.00
G	0.46	0.00	1.01	0.35	0.24	0.27	0.12	0.14	0.63	0.24	0.14	0.00	1.96	0.00	0.23	0.25	2.63	6.13	0.39

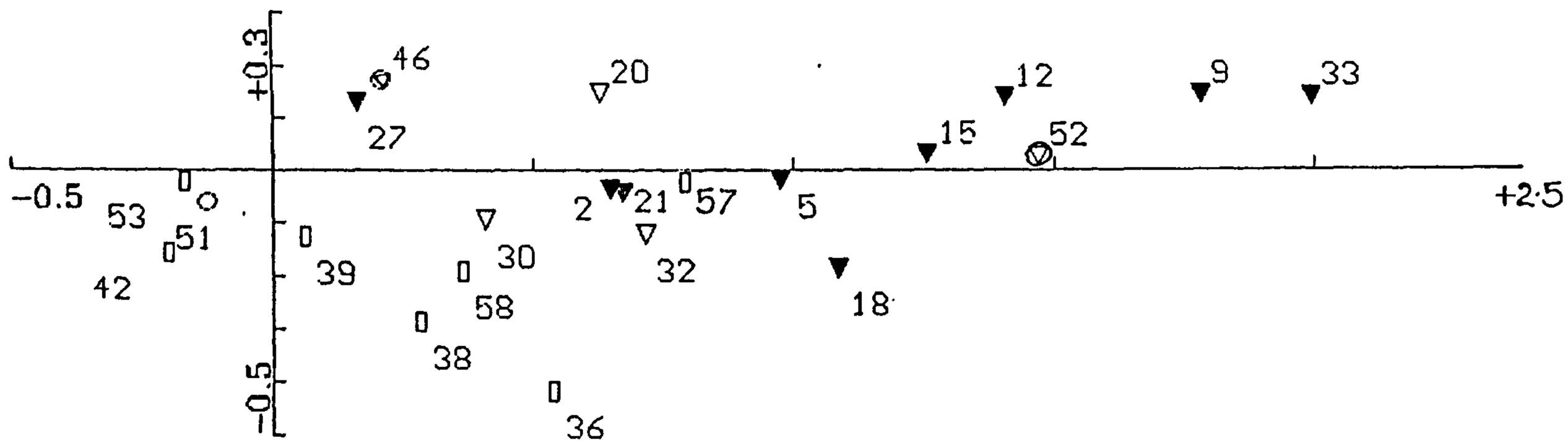
	Anthicu	Tip uni	Pti fur	Pal rat	Tro sca	Geotrup	Oxy syl	Aph gra	Aphodiu	Phy hor	Gra min	Phylltr	Haltcin	Cha con	Bruchus	Apion	Sit gra	Curcid
CAN	0.14	1.86	0.44	0.00	0.19	0.00	0.25	0.17	1.28	0.00	0.08	0.24	0.25	0.16	0.24	0.67	0.72	0.62
OP	1.89	0.80	1.19	0.00	0.38	0.07	0.19	0.06	1.52	0.00	0.19	0.12	0.09	0.00	0.55	0.73	0.00	0.34
AS	0.25	0.00	1.78	0.00	0.35	0.00	0.81	0.47	1.97	0.00	0.30	1.70	0.29	0.44	2.21	0.40	0.00	1.08
R	1.13	1.62	1.20	1.63	0.00	0.25	0.00	0.00	3.42	0.50	0.00	0.00	0.00	0.45	0.00	0.46	1.84	2.00
G	0.00	5.14	1.59	0.00	0.00	0.00	0.00	0.60	0.74	0.00	0.00	0.00	0.37	0.00	0.35	0.11	1.28	0.00

Fig. 14.1a: Features faunas, CANOCO samples plot, 42 assemblages.



Pit fauna classes	
AS	yellow
CAN	orange
CAN + S	red
G	purple
OP	green
R	blue
U	grey

Fig. 14.1b: Detail of central area, Fig. 14.1a



Site classes
well ○
ditch ▯
pit ▽

Pit fauna classes
AS yellow
CAN orange
CAN + S red
G purple
OP green
R blue
U grey

Fig. 14.2a: Feature faunas, CANOCO species plot, 42 assemblages

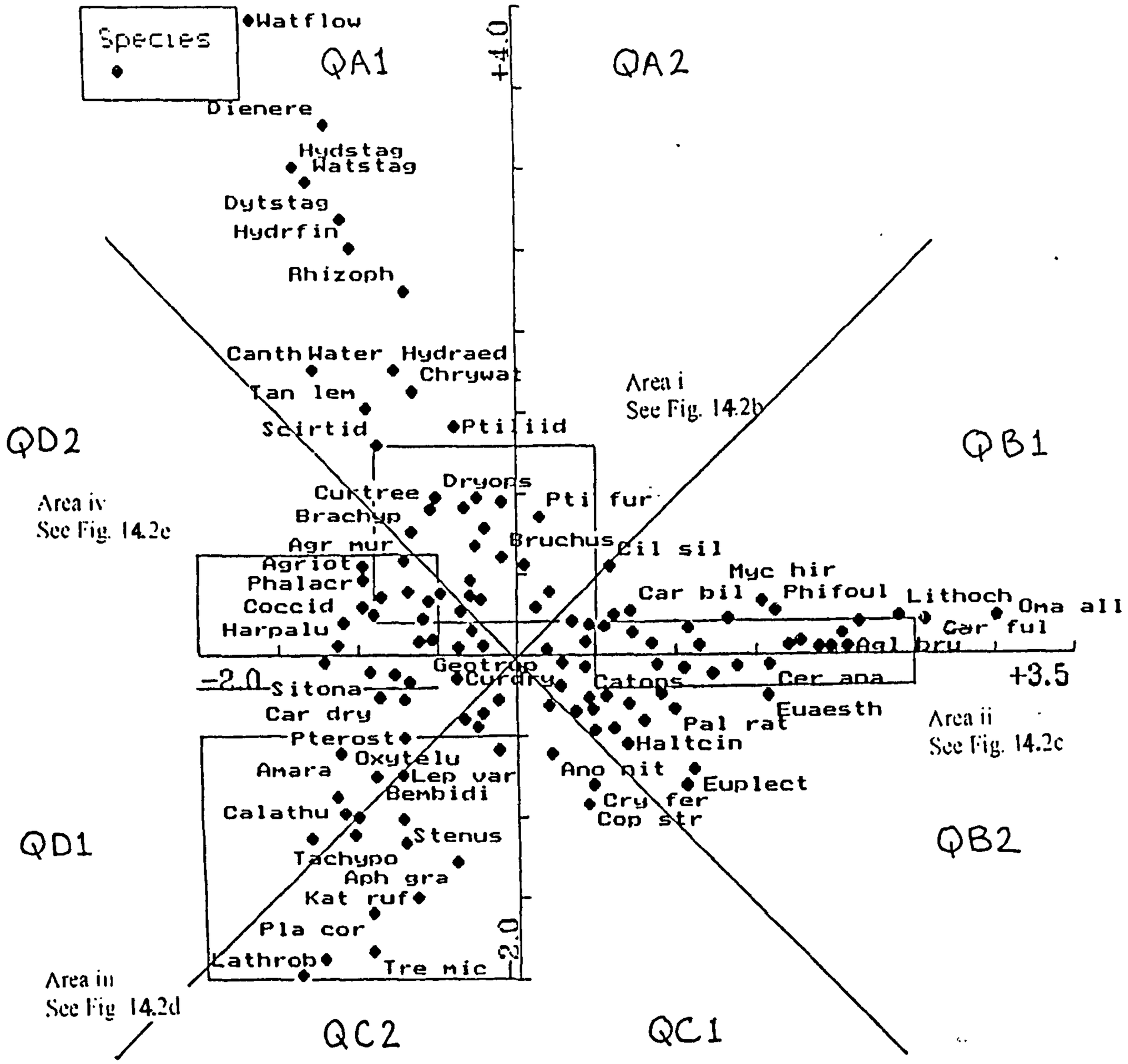
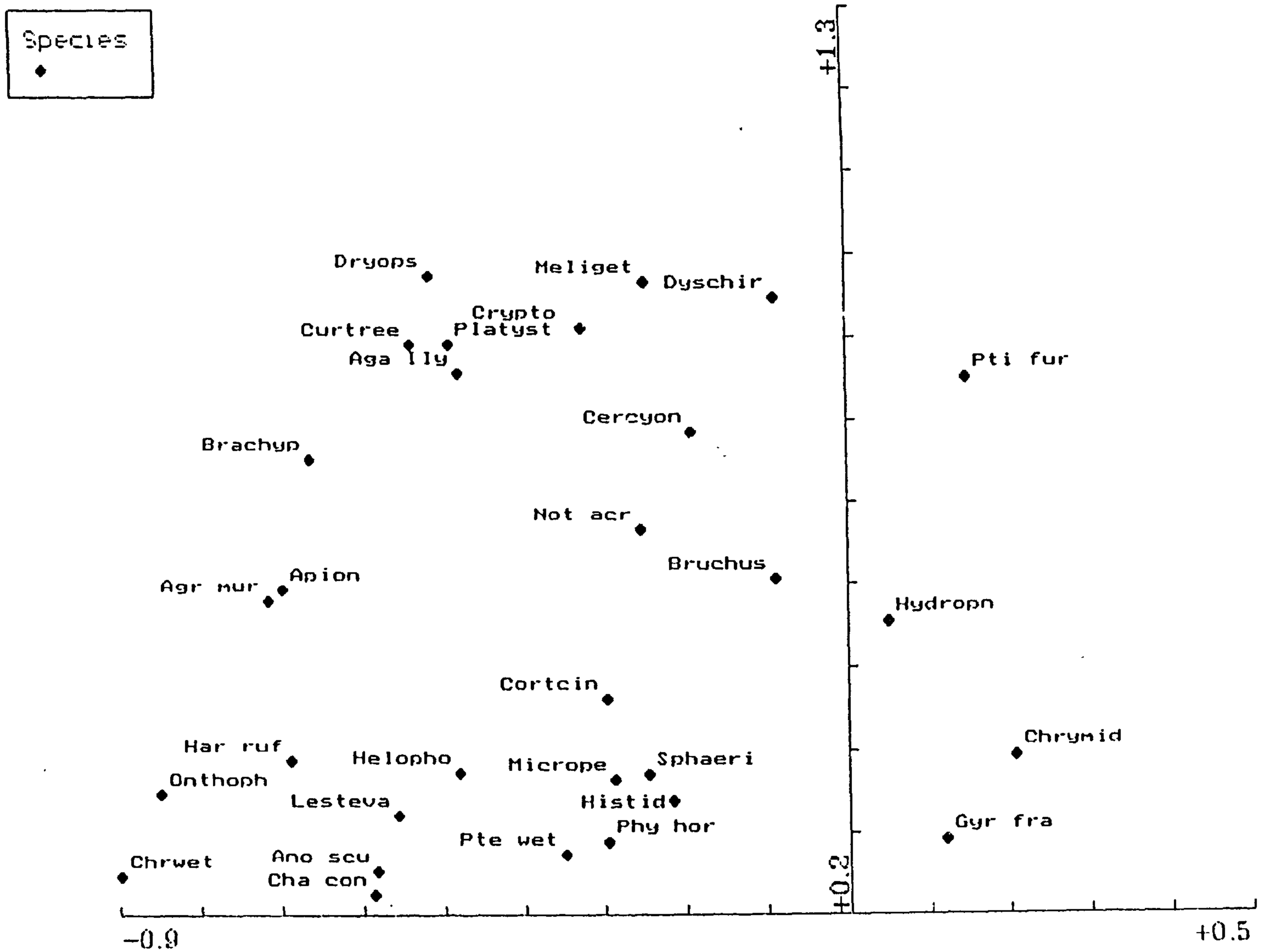


Fig. 14.2b: Feature faunas, Detail of Area i, Fig. 14.2a



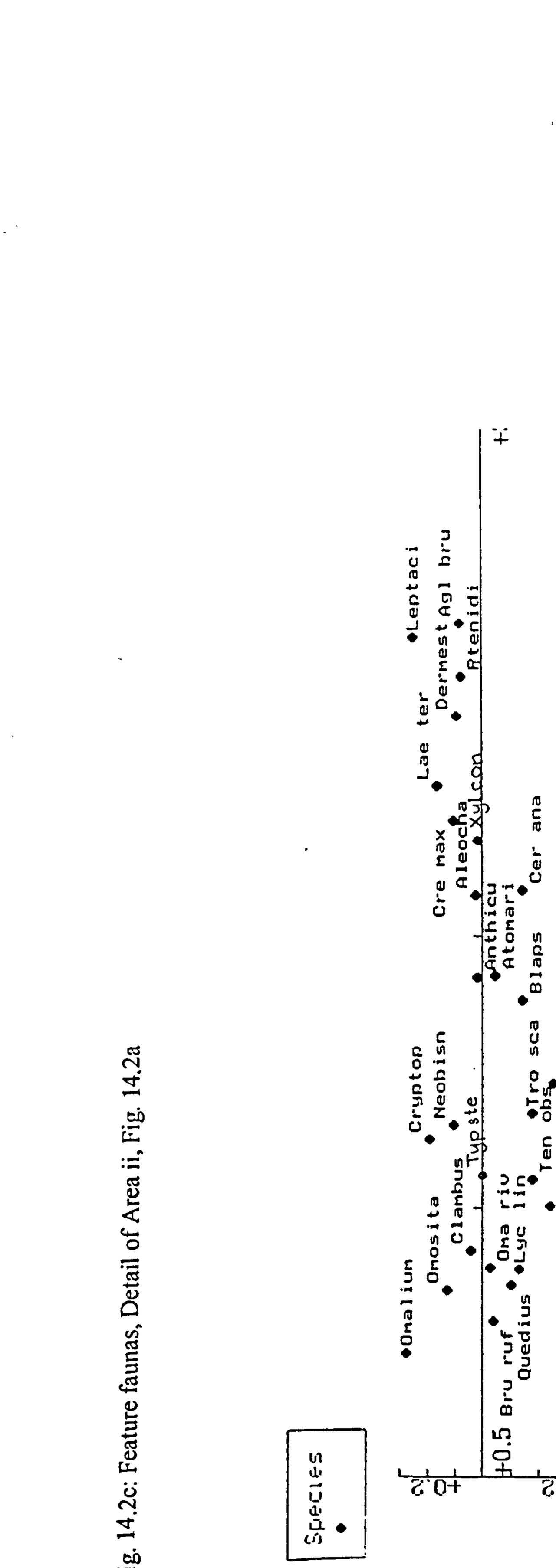


Fig. 14.2c: Feature faunas, Detail of Area ii, Fig. 14.2a

Fig. 14.2d: Feature faunas, Detail of Area iii, Fig. 14.2a

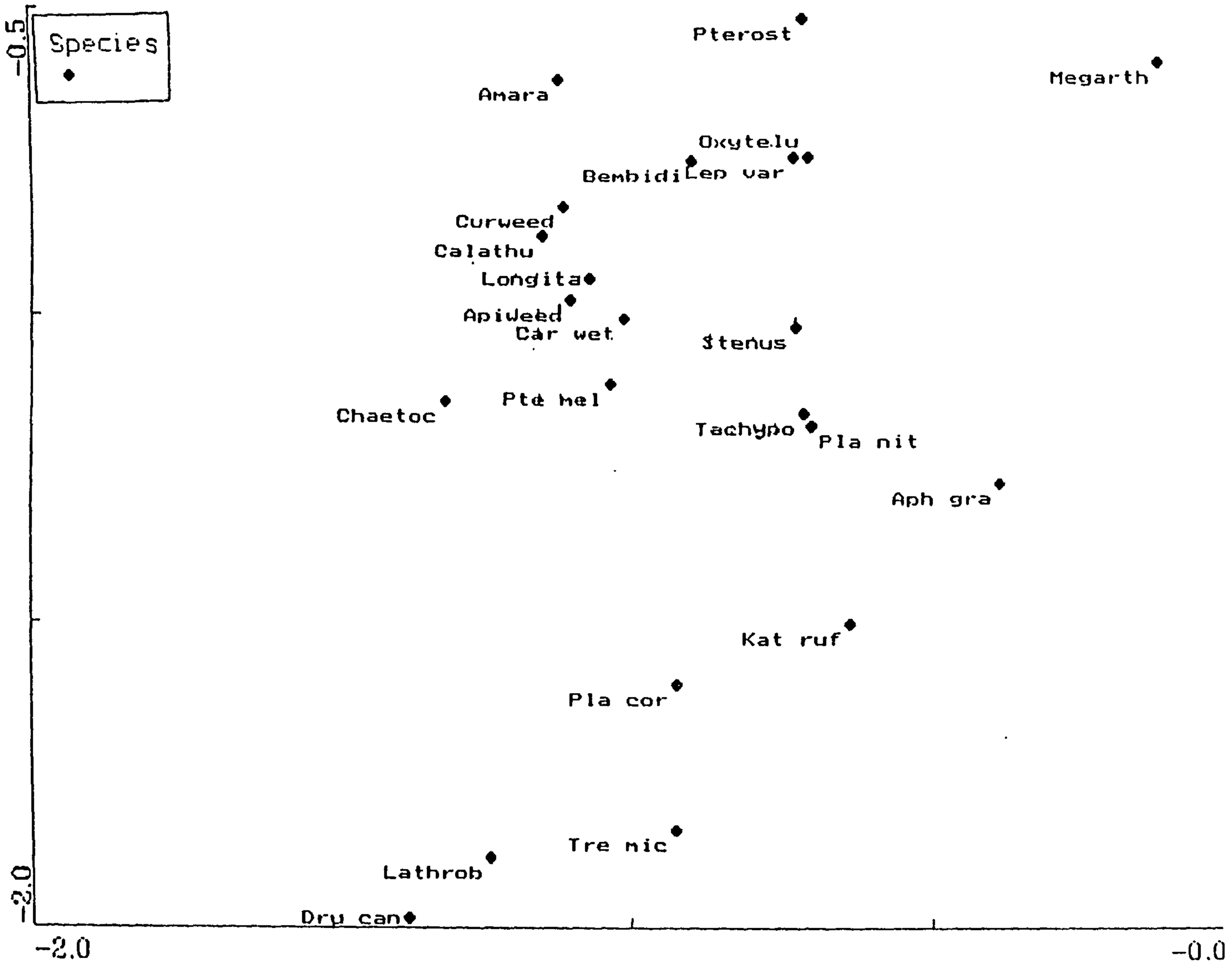


Fig. 14.2e: Feature faunas, Detail of Area iv, Fig. 14.2a

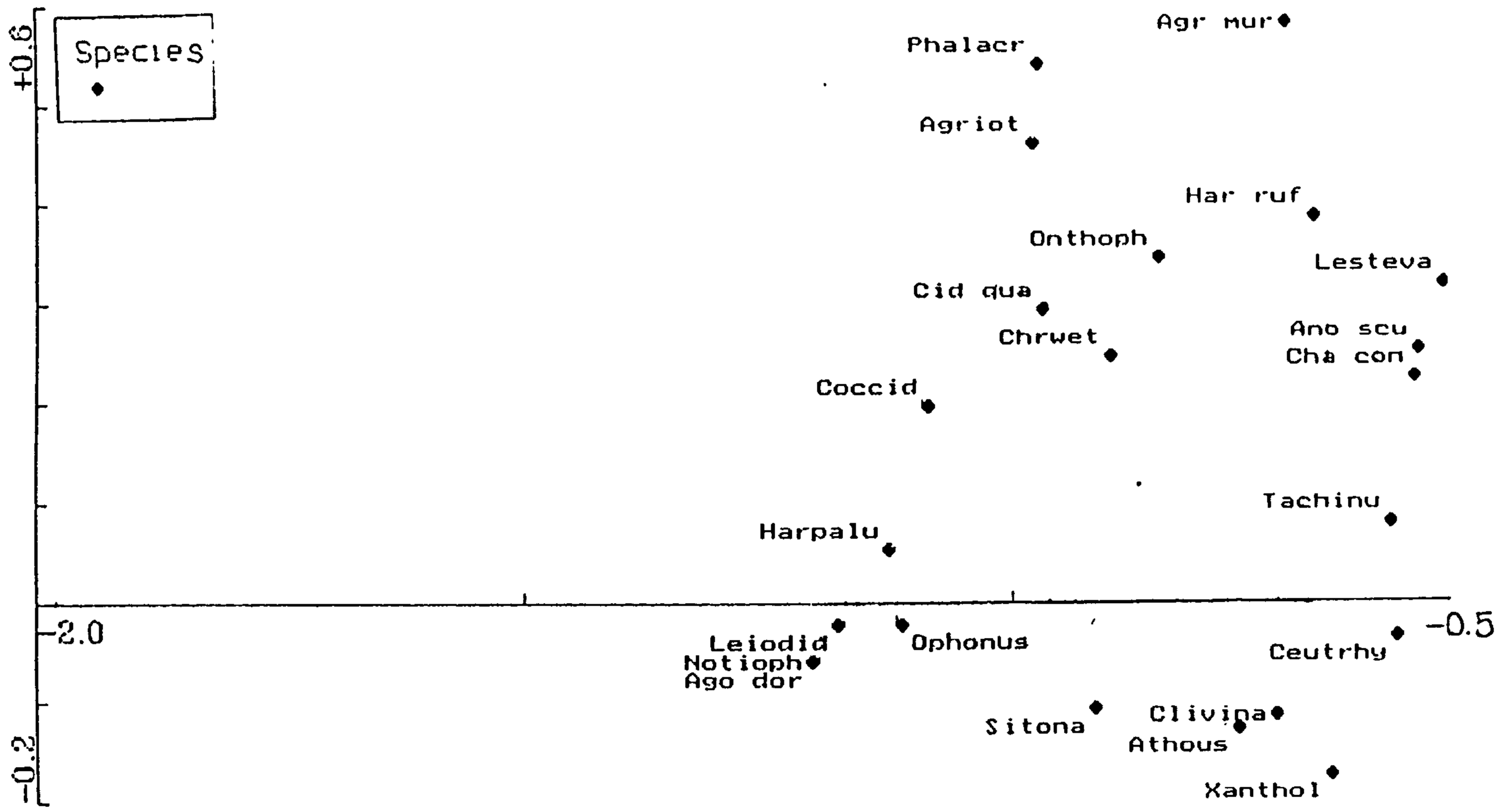


Fig. 14.3a: Feature faunas, CANOCO samples plot, 30 assemblages, grain pests omitted. Key to colours: Green = Rural; red = urban

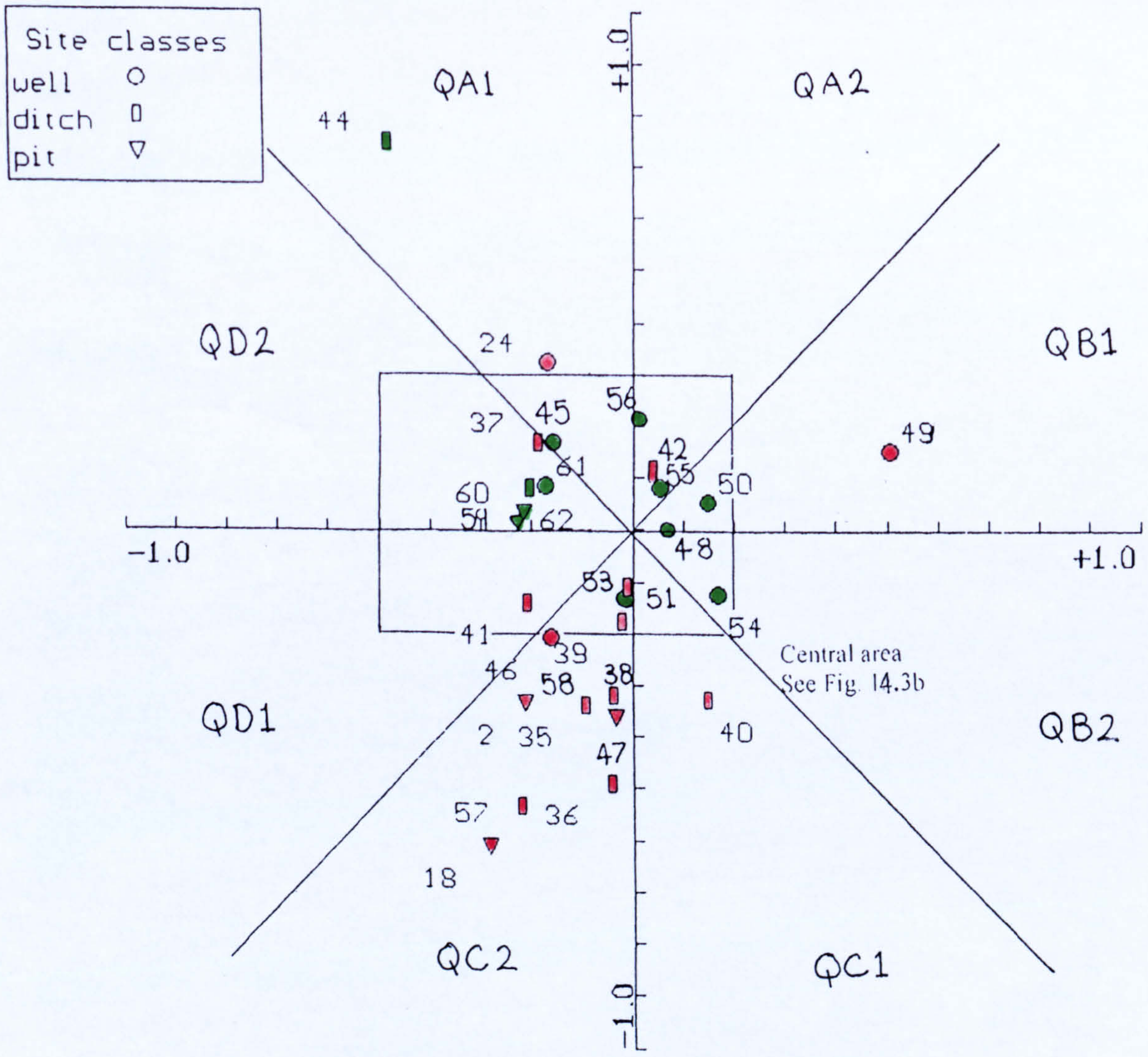


Fig. 14.3b: Feature faunas, Detail of central area, Fig. 14.3a. Key to colours: Green = Rural; red = urban

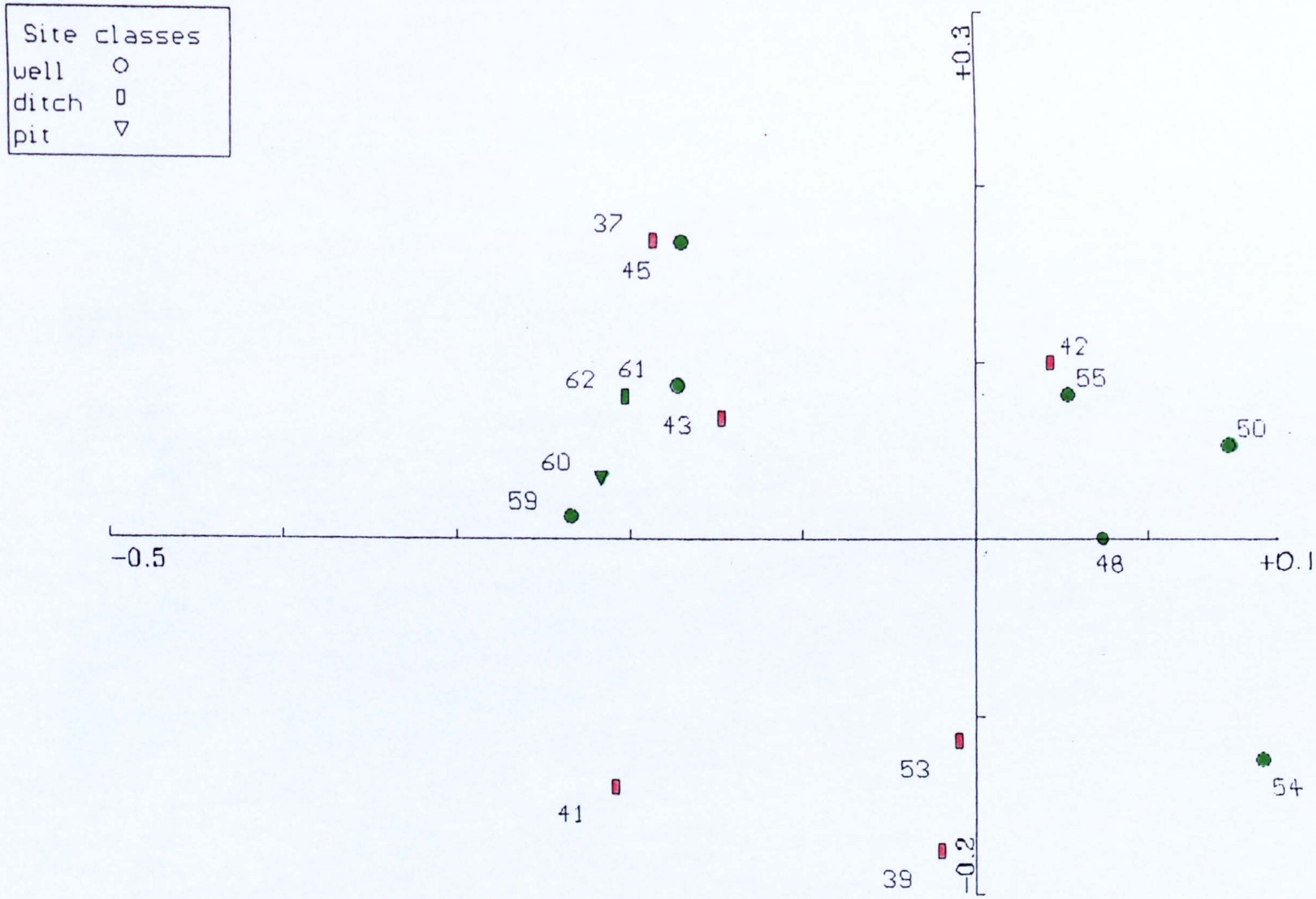
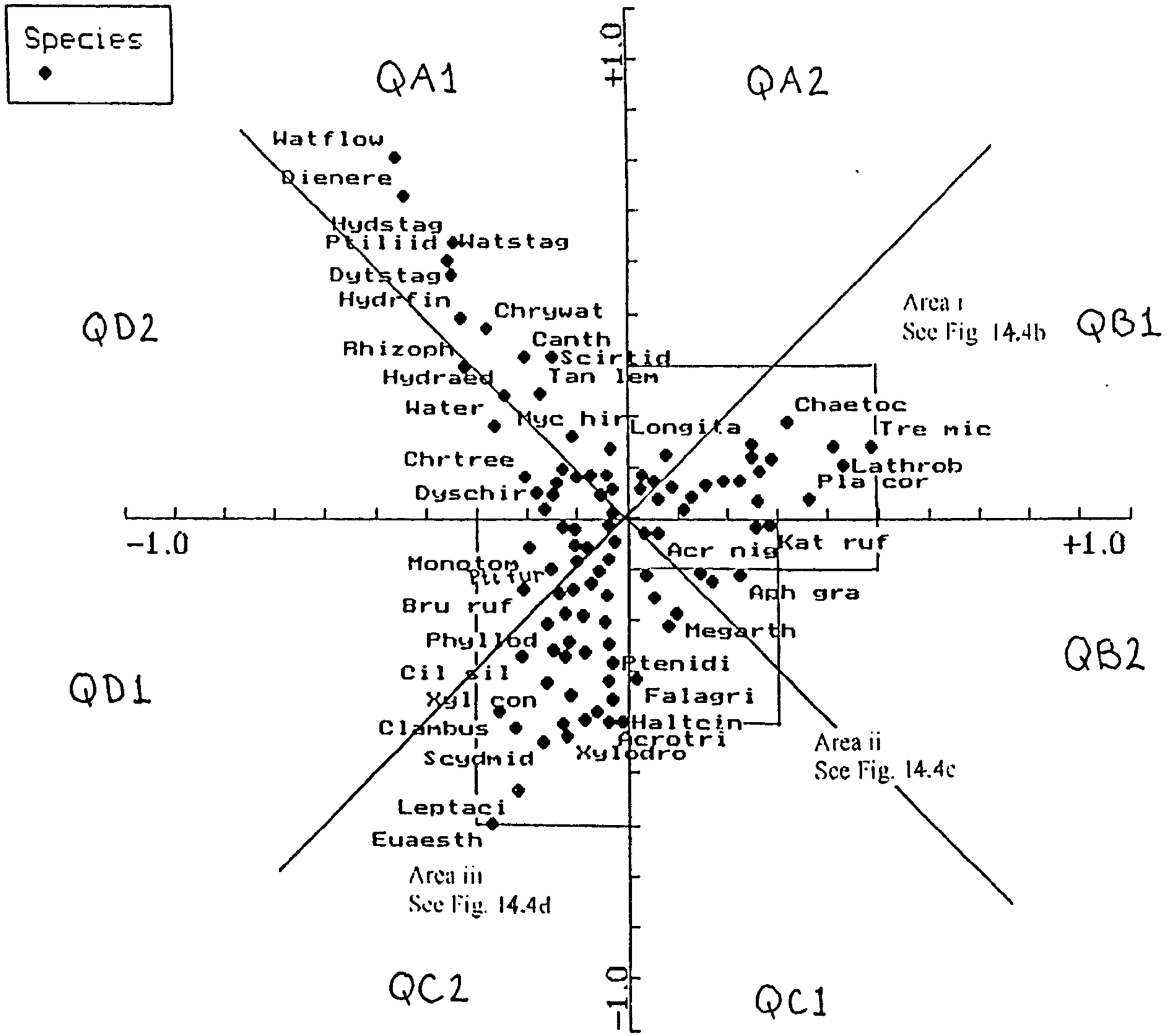


Fig. 14.4a: Feature faunas, CANOCO species plot, 30 assemblages, grain pests omitted



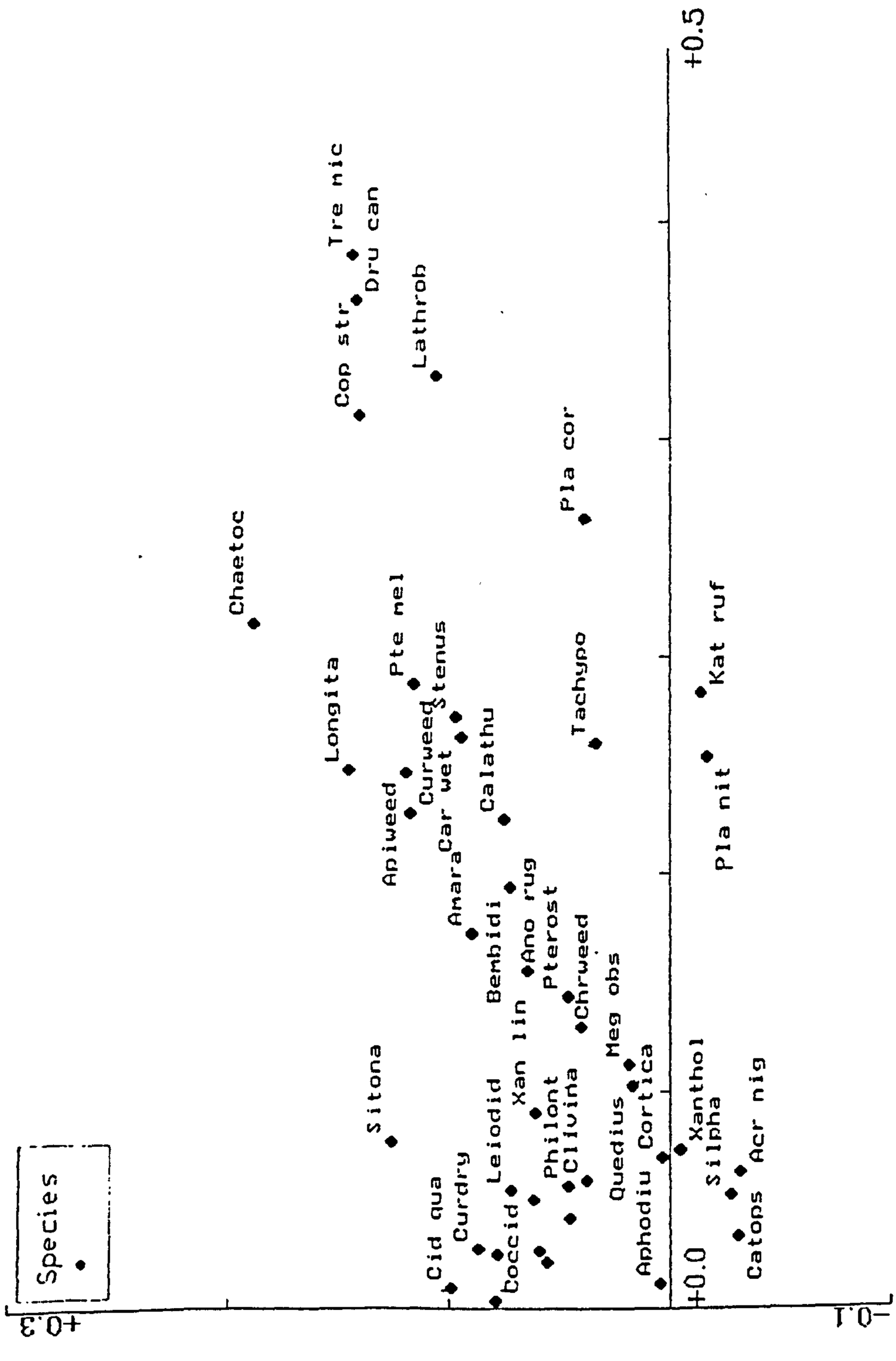


Fig. 14.4b: Feature faunas, detail of Area i Fig. 14.4a

Fig. 14.4c: Feature faunas, detail of Area ii Fig. 14.4a

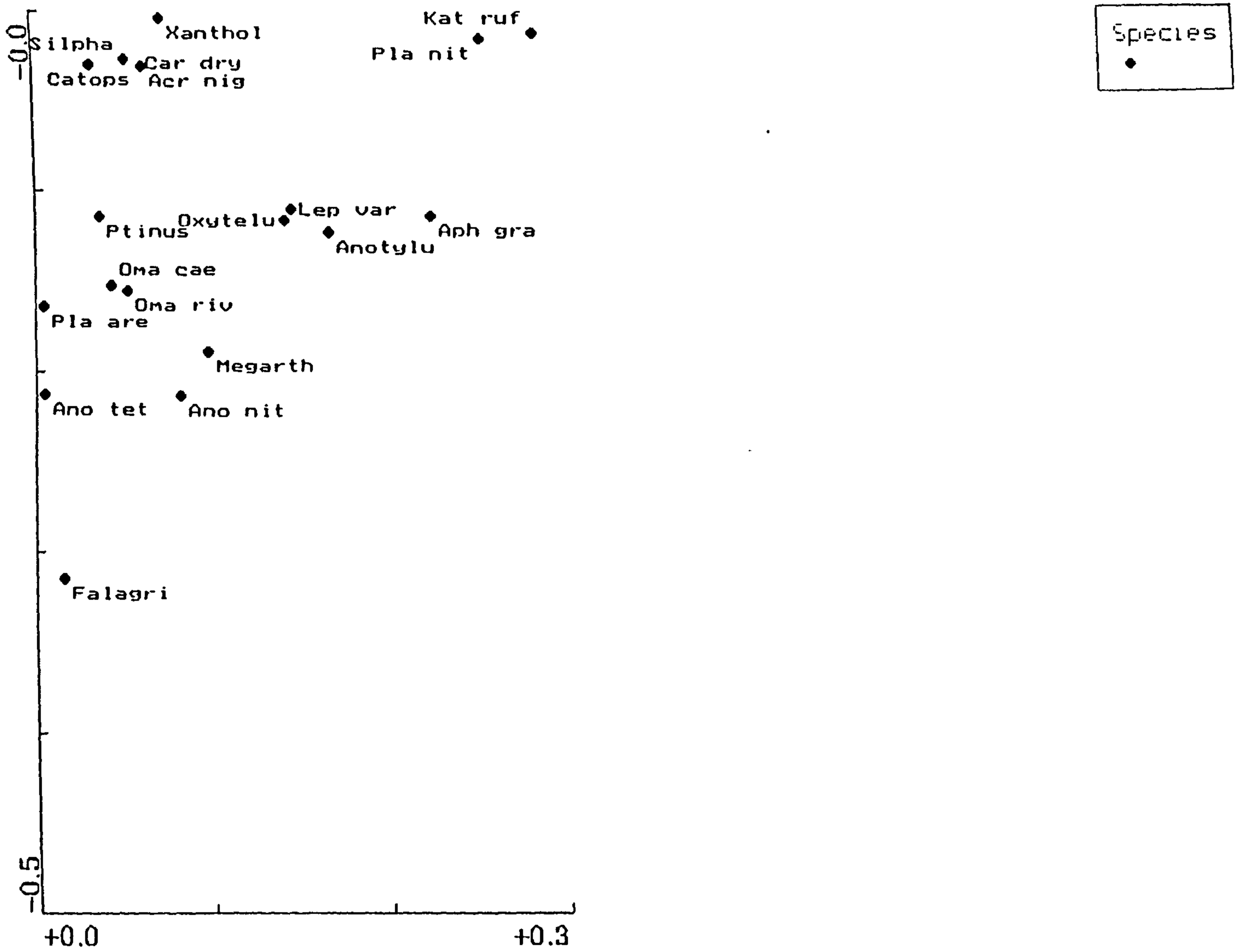


Fig. 14.4d: Feature faunas, detail of Area iii Fig. 14.4a

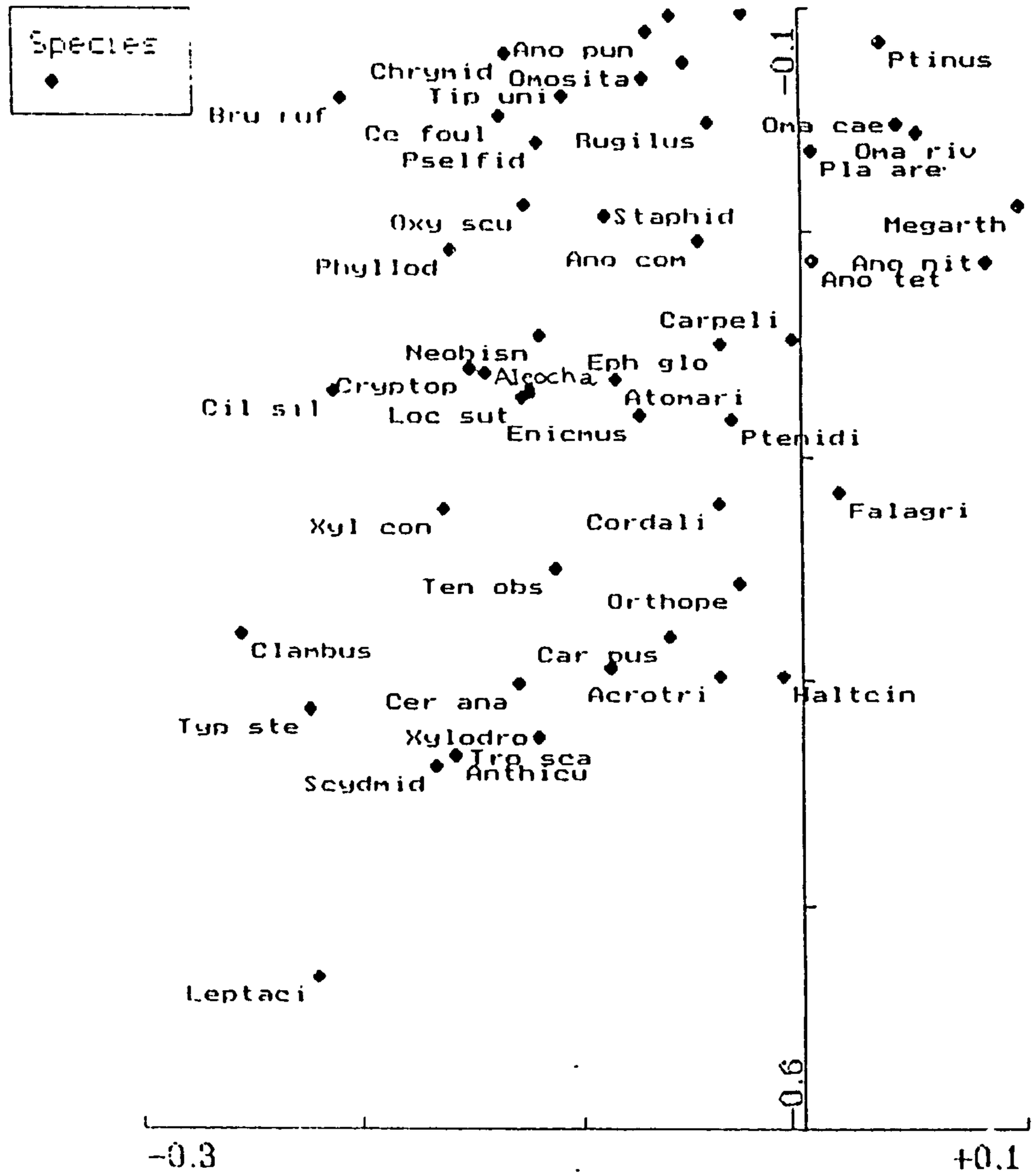


Fig. 14.5: Feature faunas

Column chart showing the habitats represented by the assemblages, grouped according to their positions on the CANOCO samples plot. (see Fig. 14.3. For key to abbreviations see Fig. 6.1

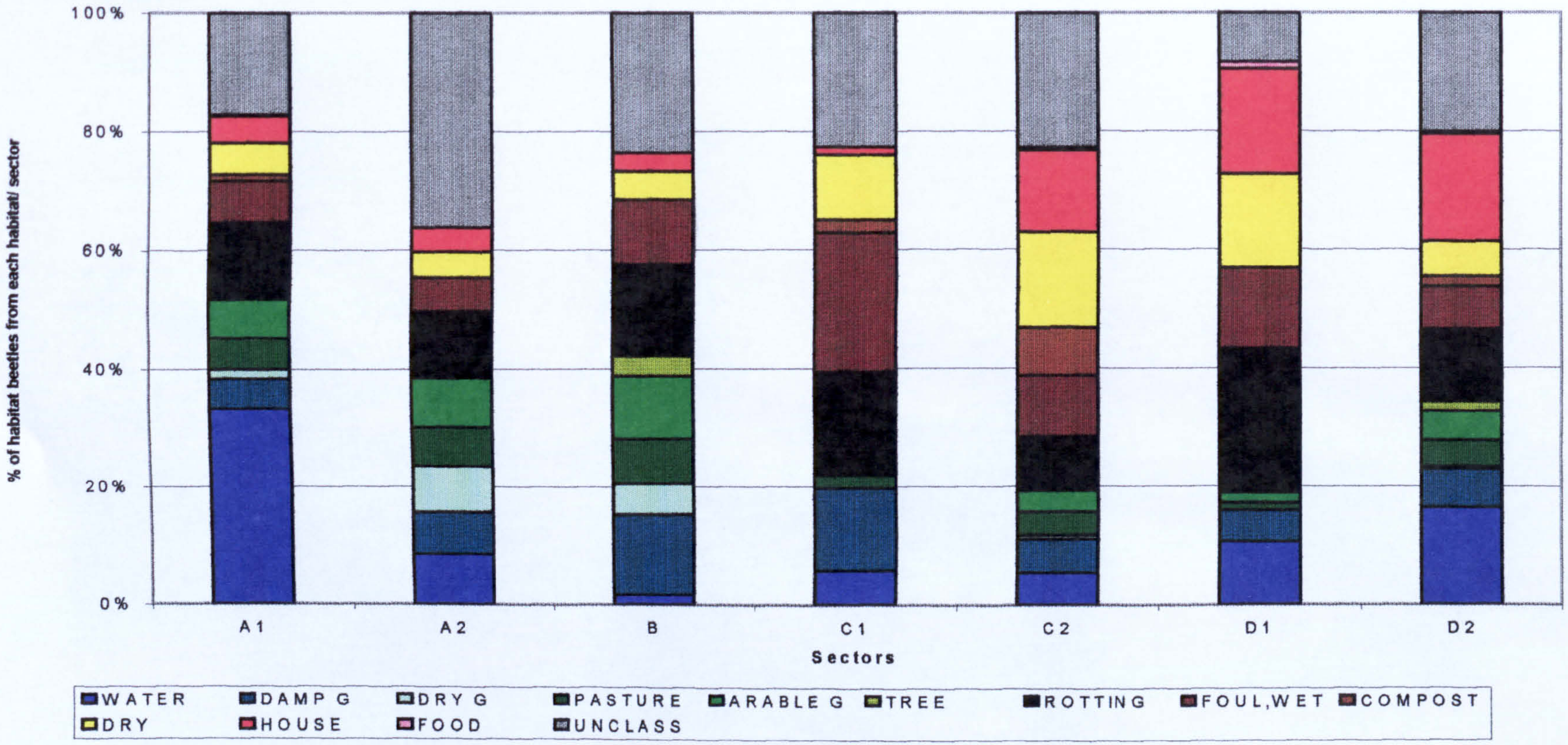


Fig. 14.6: Feature faunas

Column chart comparing the habitats represented by the assemblages grouped according to the new feature types described in Chapter 14.

For key to abbreviations see Fig. 6.1

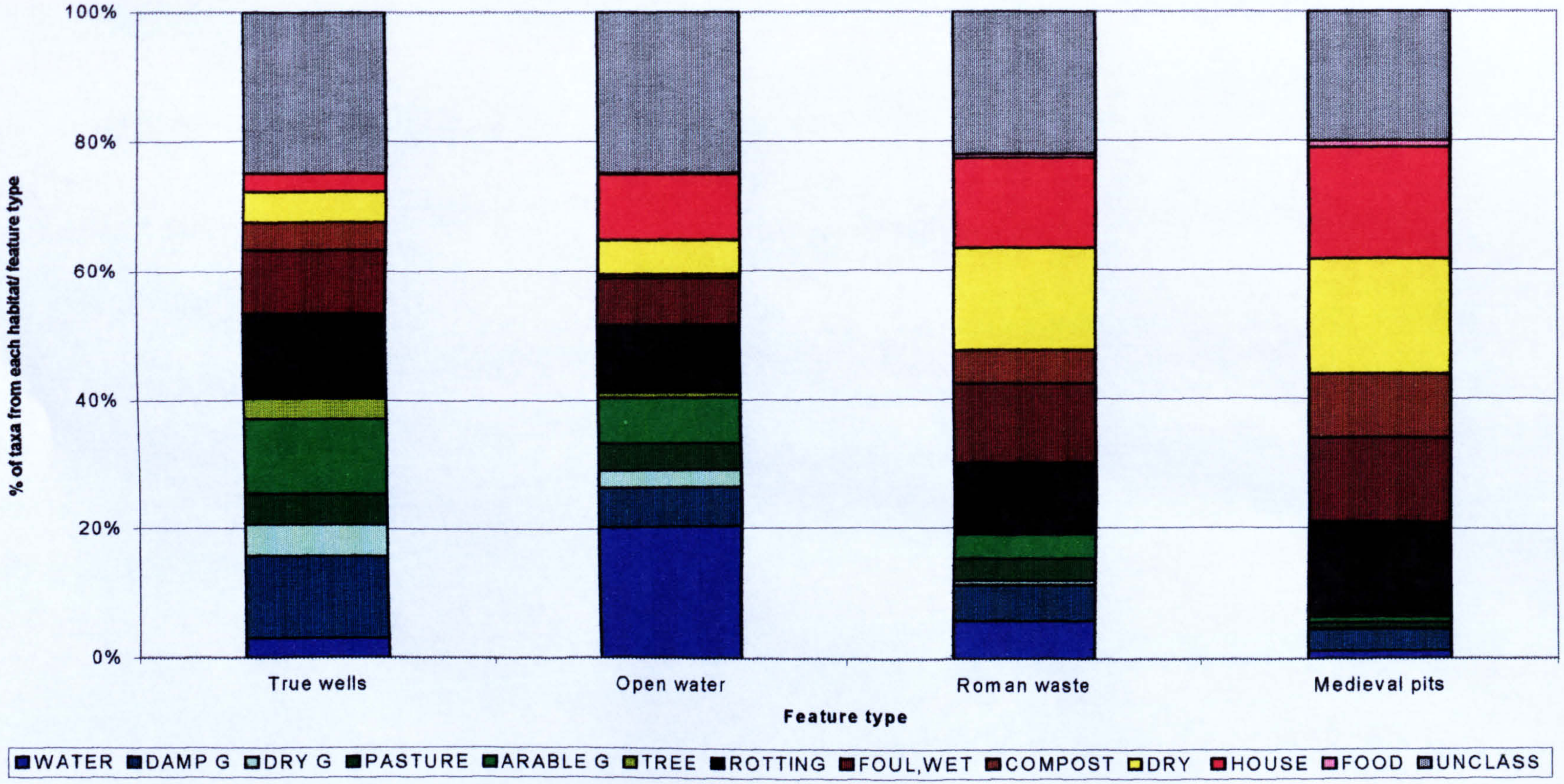


Fig. 14.7: Feature faunas

Column chart comparing the proportions of the different ecological groups represented by the assemblages, grouped according to the new feature types described in Chapter 14.

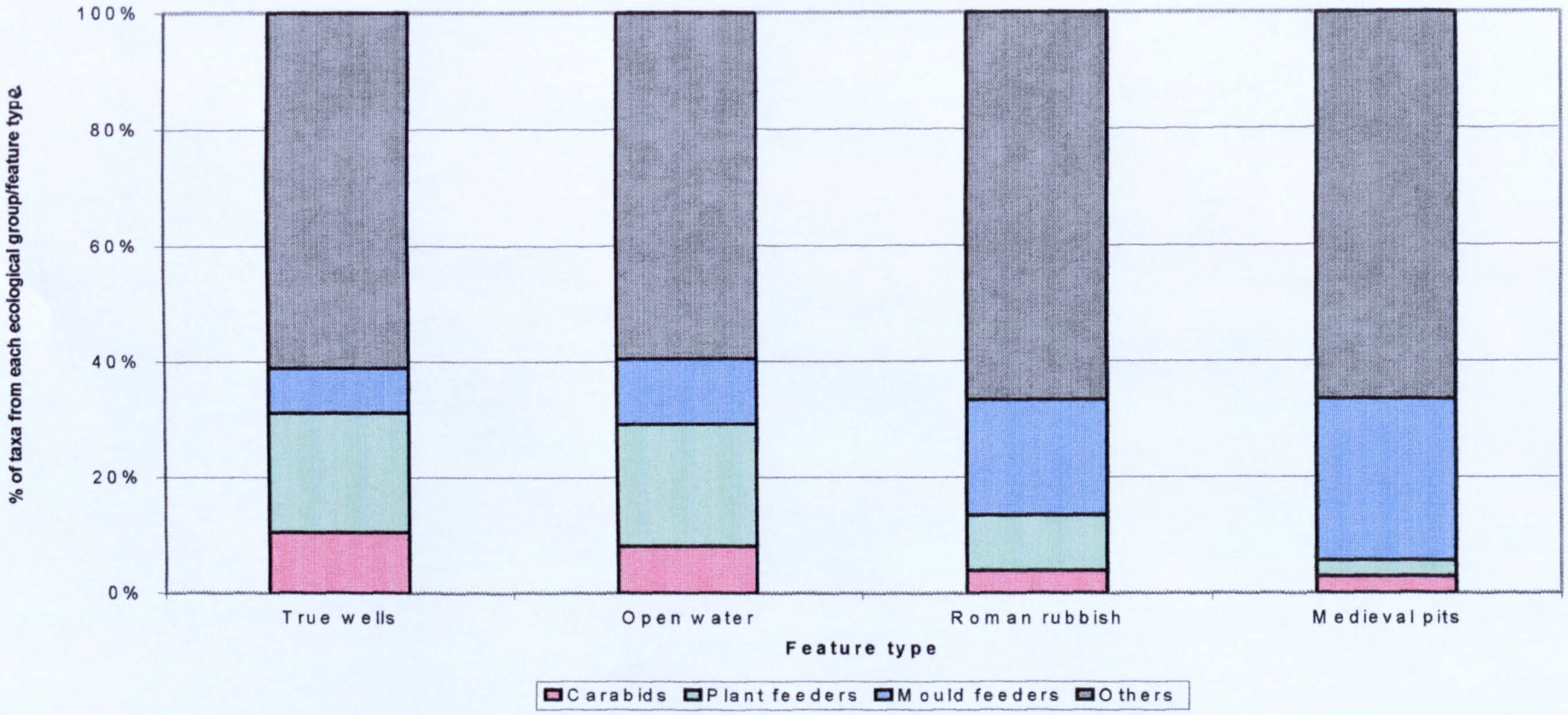


Fig. 14.8: Feature faunas

Column chart comparing the proportions of the different habitat groups represented by the assemblages from Roman pits and ditches. (Grain pests omitted).

For key to abbreviations see Fig. 6.1

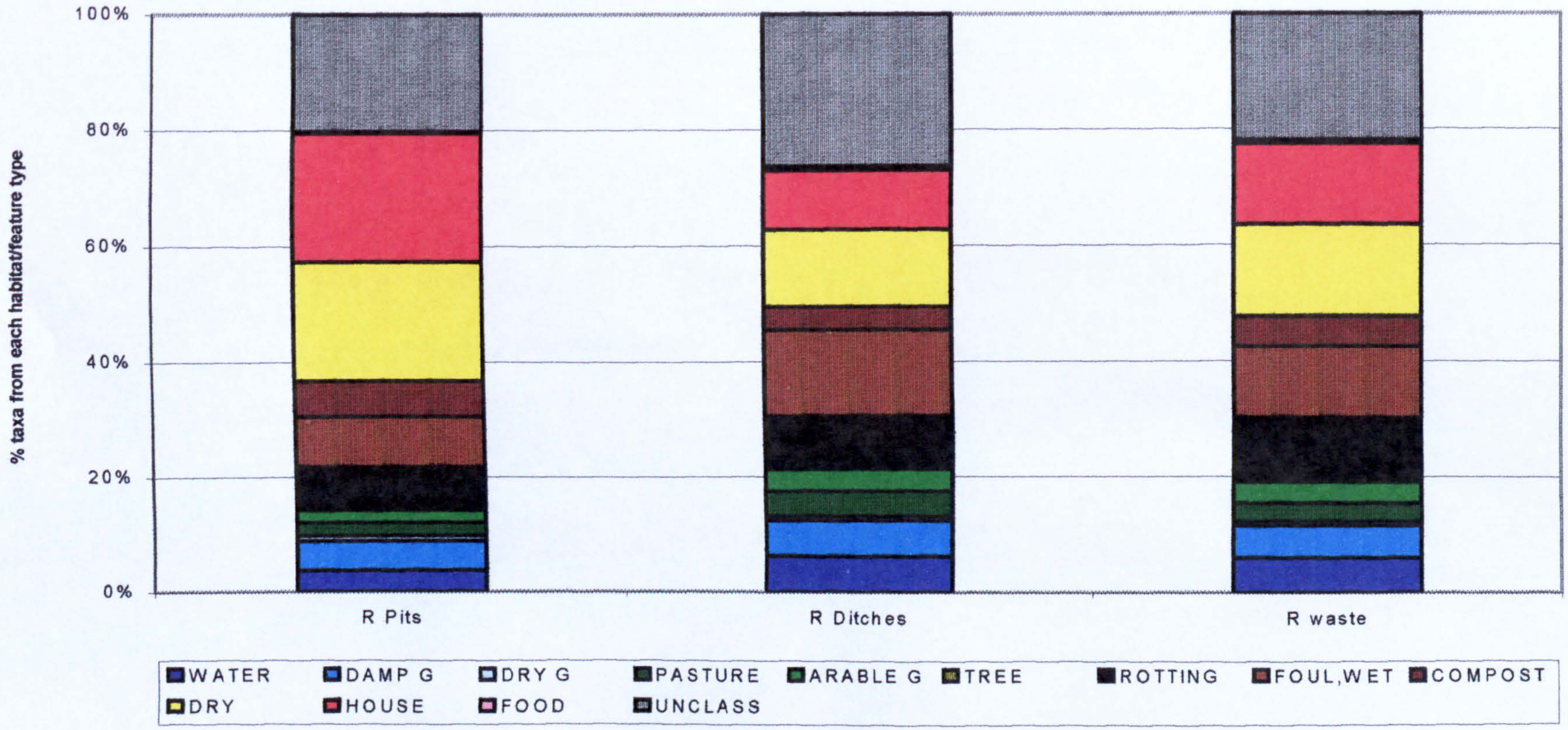


Table 14.1: Features faunas. Details of features used in Chapter 14
Please see key with Table 13.1

No.	Site	Author and date	Context nos.	Feature details	Age	Fill details and faunal type of pit assemblage	MNI	R	Biological details (non Coleopteran)	L	Z
2	York Tanner Row	Hall and Kenward 1990	4.3.3 4254 4207 4208	Rectangular	2	Varied deposits inc. food	239	FQ	Peatland, grassland plant, Flea	U	3
4	York, Tanner Row	Hall and Kenward 1990	2.27.4 2030 2036	Cut into floor of Roman building	4+	Some cess CAN + S	193	SQ		U	3
5	York Tanner Row	Hall and Kenward 1990	1.12.1 1172 1253 1255	Timber lined pit	11-12	Some cess CAN + S	185	FQ	Trace dye plants Arable weeds	U	3
9	York, Bedern NE Area II	Hall *et al.* 1993a	1359B 39	Large pit–no details	14-15	Low fills CAN This fill OP	302	FQ	Cess, Brassica Sedges etc	U	3
12	York, Bedern SW Area X	Hall *et al.* 1993c	5497 598	Large pit	14	Cess G	224	SQ	Moss	U	3
15	York, Bedern SW Area X	Hall *et al.* 1993c	5338H 467	Several layers deep pit?	15-17	Some food (fig) = cess? Stable waste? G	186	SQ		U	3
18	Carlisle LELA	Kenward and Carrott 1992a	365.2 6	Pit	2		293	FQ	Plants not examined Trace gut parasites	U	4
20	Lincoln Waterside NW	Carrott *et al.* 1995	308 34	Shallow, damaged, timber lined	12-13	Some cess Floor material? AS	117	FQ	Many flies	U	2
21	Lincoln Waterside NW	Carrott *et al.* 1995	391 11	Wattle lined	10	Cess, moss OP	194	FQ	Many flies	U	2
24	Copthall Ave, London	Allison and Kenward 1990	Pit 110	No details	4	Well?	C95	RS		R	2

No.	Site	Author and date	Context nos.	Feature details	Age	Fill details and faunal type of pit assemblage	MNI	R	Biological details (non Coleopteran)	L	Z
27	Hen Domen, Wales	Greig *et al.* 1982	Pit 1/27 11 12e 13s	Abandoned well? Layers studied 6m deep	12-13	Mainly hay, straw sedges, bracken No cess CAN	183	FQ	Plants, disturbed ground and damp meadows?	U	1
30	Southampton, Lwr. High St.	Grove this vol	2165	Unlined pit	11	Cess Straw? AS	121	FQ		U	1
32	Winchester, The Brooks	Grove this vol	5761 281	Unlined pit	9-10	Cess Straw? AS	113	FQ		U	1
33	Winchester The Brooks	Grove this vol	5726 228	Upper backfill well	11-12	Cess Straw? OP	238	FQ		U	1
35	Carlisle, OLGA	Kenward *et al.* 1992a	787 53	Dryish ditch	1	Peaty, some rubbish	113	FQ	1 daphnia, no other aquatics, 1 human 1 cattle louse. Plants not recorded	U	4
36	Copthall Ave, London	Allison and Kenward 1990	625, 583, 588, 591, 593, 601, 604	Channel	1	Channel fills, Dumped waste or via water?	C560	RS		U	2
37	Exeter, Devon	Straker *et al.* 1984	825, 813, 808, 812	Roman fortress ditch	1-2	Some dung	130	FQ	Aquatic & plants of disturbed ground Cereal remains	U	1
38	Tanner Row, York	Hall and Kenward 1990	2.4.1 2444, 2461	Deposits overlying ditch	2	Silting up of ditch, some cess?	158		Aquatic, disturbed ground plants Grape seed, Bath sponge	U	3
39	Kirkham, Lancs	Carrott *et al.* 1995a	338, 124703/T	Drainage ditch Stone fort	1-2	Some straw & dung but ?no rubbish thrown in	109	FQ	Human flea, Daphnia, Disturbed ground plants, no true aquatics	U	3
40	Durham	Kenward 1979	1726	Storm drain?	10-13		202	FQ		U	4

No.	Site	Author and date	Context nos.	Feature details	Age	Fill details and faunal type of pit assemblage	MNI	R	Biological details (non Coleopteran)	L	Z
41	Hamel, Oxford	Robinson 1981c	778	Town ditch	12	Silt with thin layer plant material	199	FQ AE.	Aquatic & disturbed ground plants Sheep ked	U	2
42	Leicester	Girling 1981b	Ditch 2 2D	Priory moat	13	Early fill of moat Sewage input	392	FQ	Oak trees surrounding moat	U	2
43	Priory, Oxford	Robinson 1986	106/5, 202	Stone lined Priory drains	15	Kitchen waste and sewage, flushed with clean water	202	FQ AE	Trees around culvert	U	2
44	Womerley, Yorks	Wagner and Pelling 1995	795	Manor house moat	13-14	Early fill of moat	411	FQ	Parkland plants, trees	R	3
45	Dragonby, Lincs	Buckland 1996	F 1584/ 2403	Iron Age-Roman Wicker-lined shaft	1	From top of shaft, sandy silt some plant remains	421	FQ		R	3
46	Carlisle, OGLB	Kenward *et al.* 1992c	184.2 5 p5	No details	2	Stable manure?	118	FQ	No gut parasites, sheep ked, ephippia, plant not recorded	U	4
47	Bedern, York	Kenward *et al.* 1986	1707 7	Well within the fortress	2-3	Filled with rubbish, sump contents mixed in?	315	FQ		F U	3
48	Rudston, Yorks	Buckland 1980	268/9		3		117	FQ	Moss	R	3
49	Chichester, W. Sussex	Girling 1989	Well 3	Deep, stone-lined	4	?Well sump	1469	FQ		U	1
50	Whitton, Glam	Osborne 1989	Layer 9	Well, no details	4	Well part filled	130	FQ	Wasteland plants, e.g nettles, rodents showed that it was acting as trap	U	1
51	Fishbourne, W Sussex	Grove this vol	Pit 28 Sample 4	Deep, unlined pit	11	Water filled pit? Many twigs and leaves Sampled 10cm from base	179	FQ	Ox skull	R	1
52	Carlisle, -OGLA	Kenward *et al.* 1992b	1237.5B 77	Rubbish filled well	12-13	Mainly fill from building	95	FQ	No plant remains recorded	U	4
53	Winchester, The Brooks	Grove this vol.	900, 899, 898, 897, 885	Wood lined drainage ditch and recut	1-2	Silty	173	FQ,	Plant not examined	U	1

No.	Site	Author and date	Context nos.	Feature details	Age	Fill details and faunal type of pit assemblage	MNI	R	Biological details (non Coleopteran)	L	Z
54	Dalton Parlours, Yorks	Sudell 1981	Well 1 362	Well, revetment wall and well house	3	Well sump	333	FQ		R	3
55	Appleford, Oxon	Robinson 1975	32	Well, but no buildings found	3		424	FQ AE.		R	2
56	Appleford, Oxon	Robinson 1975	250 upper	Well, but no buildings found	4	Sampled near top	244	FQ AE.		R	2
57	Rougier St. York	Hall and Kenward 1990	1.1 1381 142/T	Drainage ditch	2	Cess? Refuse	60	FQ	Heathland component.	U	3
58	Tanner Row, York	Hall and Kenward 1990	2.10.1 2412 438/1	Drainage ditch	2	"Gradual accumulation in open" Some cess?	100	FQ		U	3
59	Farmoor, Oxon	Lambrick and Robinson 1979	1050/2	Stone lined, 1m deep	3-4	Sampled halfway down	411	FQ AE.	Much wood and *Prunus* stones	R	2
60	Farmoor, Oxon	Lambrick and Robinson 1979	17/4	Unusual, shallow, large clay-lined pit.	3-4		699	FQ AE.	Many fungal spores Wheat chaff	R	2
61	Farmoor, Oxon	Lambrick and Robinson 1979	1046/2	Stone-lined well, 2m deep	4	Well sump	116	FQ AE	Some plant fibres	R	2
62	Farmoor, Oxon	Lambrick and Robinson 1979	1074/4	Droveway ditch,	3-4		136		Some whole plants	R	2

Table 14.2: Features faunas. Final list 172 taxa, used in CANOCO analysis
For sample details see Table 14.1; for list of abbreviations see Table 14.3.

No.	Dyschir	Notioph	Clivina	Tre qua	Tre mic	Bembidi	Harpalu	Ophonu	Har ruf	Pterost	Pte mel	Pte wet	Calathu	Lae ter	Ago dor	Amara	Car wet	Car dry	Carabid	Dytstag	Hydraed	Hydrfln	Hydstag	Hydropn	Aga lly	Watflow	Water	Watstag	Helopho	Sphaeri	Cercyon
2	0.00	0.00	0.00	1.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.10	2.20	0.00	1.10	0.00	0.00	1.10	0.00	0.00	0.00	0.00	2.75	0.00	0.00
4	0.00	0.00	0.00	0.00	4.69	0.52	0.00	0.00	0.00	0.00	1.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.08
5	0.00	0.00	0.00	1.64	2.19	0.00	0.00	0.00	0.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.09	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.66
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50
15	0.00	0.00	0.00	0.53	0.00	0.53	0.00	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.00	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.55	0.00	0.00	0.00	0.00	0.00	0.00	1.55	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.16	0.00	1.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.16	0.00	1.16
21	0.00	0.00	0.62	0.00	0.00	0.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.86	0.62	0.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.24	0.00	1.86
24	0.00	0.00	0.00	1.14	0.00	3.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.14	0.00	0.00	1.14	1.14	7.95	2.27	7.95	0.00	1.14	0.00	0.00	0.00	1.14	1.14	7.95
27	0.00	0.00	0.00	0.54	0.00	0.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.09	0.00	0.54	0.54	0.00	0.00	0.54	0.00	0.00	0.00	2.17	0.00	5.98
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.85
32	0.00	0.00	0.00	0.00	0.91	0.00	0.00	0.00	0.00	0.00	0.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.82
33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
35	0.00	0.00	0.00	0.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.99
36	0.00	0.00	0.00	0.00	0.00	1.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.70	0.00	1.70
37	0.00	0.00	0.00	0.78	0.00	0.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.39	0.39	0.00	0.00	0.39	0.78	5.47	0.39	0.00	0.00	0.00	0.00	0.39	2.73	0.39	2.73
38	0.00	0.00	0.00	0.65	0.00	0.00	0.00	0.00	0.65	0.00	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.23	0.00	0.00	0.00	0.65	0.00	0.00	0.00	3.23	0.00	1.29
39	0.00	0.00	0.00	0.93	0.93	2.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.93	0.93	0.00	1.85	0.00	0.93	0.93	0.00	0.93	0.00	0.00	0.00	0.00	3.70	0.00	0.93
40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.84	0.00	0.00
41	0.00	0.00	0.00	0.00	0.00	1.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.96	1.18	0.00	0.00	0.00	0.00	0.00	0.00	6.51	0.00	18.34
42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.09	0.00	3.25
43	0.00	0.00	0.00	0.00	0.00	2.61	0.00	0.00	0.00	0.00	0.00	1.31	0.00	0.00	0.00	0.00	0.00	0.00	4.58	1.31	3.92	0.00	0.00	0.00	0.00	0.00	0.00	3.27	5.88	0.00	5.23
44	0.00	0.00	0.00	0.00	0.00	0.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.76	12.58	12.88	4.60	0.00	0.00	5.52	2.15	8.59	4.60	0.00	0.00
45	1.37	0.00	0.00	0.00	0.00	0.82	0.00	0.00	1.10	0.00	1.10	0.82	1.10	0.00	0.00	3.85	0.00	0.00	0.00	0.00	9.34	3.30	0.00	0.82	0.82	0.00	0.00	2.20	7.97	0.82	3.02
46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.69	0.00	0.00	0.00	0.00	0.00	0.85	0.00	0.00	0.00	0.00	0.00	0.00	10.17	0.00	0.00
47	0.00	0.00	0.00	1.15	0.00	1.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.77	1.15
48	0.00	0.88	0.00	0.00	0.00	0.00	2.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.88	1.75	0.00	0.88	0.88	0.00	0.00	0.00	0.00	0.88	0.00	0.00	0.00	0.00	0.88	0.88	2.63
49	0.00	0.00	0.00	0.00	5.93	5.60	0.00	0.00	0.00	0.67	1.59	0.00	0.84	0.00	0.00	3.09	0.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.26	0.00	0.00
50	0.00	0.00	0.83	0.00	0.83	0.00	0.00	0.00	0.00	0.00	0.00	0.83	0.00	0.00	0.00	3.31	2.48	0.83	1.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
51	0.00	0.00	0.00	0.00	0.00	2.25	0.00	0.00	0.00	0.00	0.56	1.12	0.00	0.00	0.00	0.56	0.56	0.56	1.69	0.00	2.81	0.56	0.00	0.56	0.56	0.00	0.00	0.00	3.37	0.00	2.25
52	1.06	0.00	0.00	1.06	1.06	0.00	0.00	0.00	0.00	0.00	0.00	1.06	0.00	1.06	0.00	0.00	0.00	0.00	2.13	0.00	0.00	0.00	0.00	1.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00
53	0.00	0.00	0.57	1.15	0.57	0.00	0.00	0.00	0.00	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.15	0.00	0.00	0.00	1.15	0.00	0.00	0.57	0.00	0.00	2.30	2.87	5.17
54	0.00	0.00	0.00	0.00	0.00	2.61	0.00	0.65	0.65	0.00	0.00	1.30	1.95	0.00	0.00	1.30	0.00	2.61	1.63	0.00	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.28	0.00	1.63
55	0.00	0.79	0.79	2.88	0.00	2.36	1.83	1.31	0.79	0.79	1.83	0.00	1.31	0.00	0.79	7.85	0.79	2.88	3.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.09	0.00	0.79
56	0.00	0.00	0.00	2.22	0.00	1.78	0.00	0.89	0.89	2.22	0.00	0.00	0.00	0.00	0.00	2.67	0.00	0.00	4.00	0.00	2.22	0.00	0.00	0.00	0.00	0.00	0.00	1.33	8.89	0.00	1.78
57	0.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.65	0.00	1.77	0.00	0.00	1.77	0.00	0.00	0.00	0.00	0.88	0.88	0.88
58	0.00	0.00	0.00	0.00	0.00	1.01	0.00	0.00	0.00	1.01	0.00	0.00	0.00	0.00	0.00	1.01	0.00	0.00	4.04	0.00	1.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.02	0.00	1.01
59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.27	0.00	0.00	0.00	0.00	0.00	4.43	0.00	3.69	0.00	6.27
60	0.00	0.00	0.00	0.00	0.00	1.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.85	0.00	1.02	1.35	0.00	0.00	0.00	0.00	1.18	0.00	2.88	0.00	24.20
61	0.00	0.00	0.00	2.73	0.00	3.64	0.00	0.91	0.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.91	0.91	0.91	0.00	0.91	0.00	0.00	0.91	0.00	0.00	8.18	0.00	4.55	0.00	5.45
62	0.00	0.00	0.00	0.00	0.00	3.03	0.76	0.00	0.76	0.00	0.00	1.52	0.00	0.00	0.00	0.00	0.00	0.00	0.76	2.27	3.03	1.52	0.00	2.27	1.52	0.00	0.76	0.76	10.61	0.00	2.27

Table 14.2: Features faunas. Final list 172 taxa, used in CANOCO analysis
For sample details see Table 14.1; for list of abbreviations see Table 14.3.

No.	Cer ana	Ce foul	Meg obs	Crypto	Acr nig	Histid	Silpha	Leiodid	Catops	Clambus	Scydmic	Orthope	Ptenidi	Acrotri	Ptiliid	Microps	Megarth	Lesteva	Phyllod	Omalium	Oma ca	Oma riv	Oma all	Xyl con	Xylodro	Cop str	Car bil	Car ful	Car pus	Carpell	Ano rug
2	1.10	1.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.95	0.00	0.00	1.65	0.00	0.00	0.00	0.00
4	1.04	1.04	0.00	0.00	0.52	0.00	0.00	0.00	0.00	0.52	0.00	0.00	0.00	0.00	1.56	0.00	0.00	0.00	0.00	1.04	0.00	0.00	0.00	2.60	0.00	9.38	1.56	0.00	0.00	0.00	2.08
5	7.10	1.09	0.00	0.00	0.00	0.55	0.00	0.00	2.19	0.00	0.55	0.00	2.19	1.09	0.00	0.00	0.00	0.00	1.09	1.09	0.00	1.09	0.00	1.64	0.00	0.55	8.20	1.09	0.00	0.55	2.73
9	4.40	0.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.06	0.73	0.00	0.00	0.00	0.00	0.00	1.47	0.00	0.00	0.00	3.30	0.00	0.00	1.47	9.52	0.00	0.00	0.00
12	1.00	1.00	0.00	0.00	0.00	1.50	0.00	0.00	0.00	0.00	0.00	0.00	3.00	0.00	0.00	0.00	0.00	0.00	3.00	3.00	0.00	6.50	0.00	7.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	1.07	1.07	0.53	0.00	0.00	0.00	0.00	0.00	0.53	0.00	1.07	0.00	8.02	0.00	0.00	0.00	0.00	0.00	0.00	3.21	0.00	0.00	0.00	1.60	0.00	3.21	0.53	0.00	0.00	0.53	1.60
18	8.29	1.04	1.55	0.00	0.00	0.00	0.00	0.00	0.00	1.55	1.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.07	0.00	0.00	0.00	0.00	0.00	1.04	0.00
20	10.47	2.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.33	0.00	1.16	0.00	0.00	0.00	8.14	0.00	0.00	1.16	1.16	0.00	0.00	0.00	0.00	1.16	0.00	0.00	0.00	0.00	0.00	4.65
21	3.11	1.24	0.00	0.00	0.62	0.62	0.62	0.00	0.62	0.00	0.62	0.62	2.48	2.48	0.00	0.00	0.00	0.62	0.00	1.86	0.00	0.00	0.00	0.00	0.00	1.24	0.00	0.62	0.62	0.00	1.86
24	0.00	0.00	1.14	0.00	0.00	0.00	0.00	0.00	0.00	1.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.82
27	0.00	1.09	0.00	0.00	0.00	0.00	0.54	0.00	0.54	0.00	0.00	0.00	0.00	0.00	1.63	0.00	0.00	1.09	0.00	1.09	0.00	3.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.89	5.43
30	0.96	1.92	0.00	0.00	0.00	0.00	0.00	0.00	2.88	0.96	0.00	2.88	0.00	0.96	0.00	0.00	0.96	0.00	0.00	0.96	0.00	1.92	0.00	0.96	0.00	0.00	0.00	0.00	0.00	0.96	0.00
32	0.00	1.82	0.00	0.00	0.91	0.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.91	0.00	0.00	0.00	1.82	0.00	0.00	0.00	2.73	0.00	3.64	1.82	0.00	0.00	0.00	3.64
33	10.29	0.98	0.00	0.00	0.00	0.00	0.00	0.00	0.98	0.00	0.00	0.00	14.22	0.00	0.00	0.00	0.00	0.00	2.45	0.00	0.00	0.00	0.98	2.94	0.00	0.00	0.00	0.00	0.00	0.00	1.47
35	0.00	0.00	0.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.00	1.98	0.00	0.00	0.00	0.00	4.95	6.93	1.98
36	1.70	1.70	1.70	0.00	1.70	0.00	0.00	0.00	0.00	0.00	0.00	1.70	1.70	5.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.40	2.38	0.00
37	0.00	0.39	0.39	0.39	0.00	0.78	0.00	0.00	0.00	0.00	0.00	0.00	0.39	0.00	1.17	0.00	0.00	0.00	0.00	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.39	0.39
38	1.94	1.29	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.65	0.00	1.29	0.65	0.00	0.00	0.65	0.65	0.00	0.65	0.00	0.00	0.00	1.29	0.00	0.00	0.00	0.00	8.39	2.58	0.65
39	2.78	3.70	2.78	0.93	3.70	3.70	0.00	0.00	0.00	0.00	0.00	0.93	0.93	0.00	0.00	0.00	0.00	0.93	0.00	0.93	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.93	0.00
40	2.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.19	1.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.49	2.92
41	0.00	1.18	0.00	1.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.78	0.00	0.00	0.00	0.00	1.18	0.00	0.00	0.00	0.00	0.00	1.18	0.00	0.00	0.00	0.00	0.00	0.00	1.18
42	0.00	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.30	4.55
43	0.00	1.31	0.00	0.00	0.00	0.00	0.00	0.00	1.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.31	0.00	0.00	0.00	0.00	1.96
44	0.00	0.00	0.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.23	0.00	0.00	0.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
45	0.82	2.20	3.30	1.10	2.75	1.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.82	0.00	0.00	0.82	1.65
46	0.00	3.39	1.69	0.85	0.00	0.00	0.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.85	2.54	0.00	0.00	0.00	0.85	0.00	0.00	0.00	0.00	0.85	0.00	0.00
47	2.69	0.77	0.00	0.00	0.00	0.00	0.00	0.00	0.77	0.00	0.00	0.00	1.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.77	0.00	0.77	0.00	0.00	0.00	0.00
48	0.00	0.00	5.26	0.00	0.00	0.88	0.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.75	0.00	2.63	0.00	4.39	1.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.88
49	0.00	0.00	2.26	0.00	0.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	3.01
50	0.00	0.00	6.61	0.00	0.00	0.83	2.48	4.13	2.48	0.00	0.00	0.00	0.00	2.48	0.00	6.61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.83
51	0.00	0.00	0.56	0.00	0.00	0.00	0.56	0.00	0.00	0.00	0.00	1.12	0.00	0.00	0.00	0.00	0.00	0.56	0.00	0.00	1.69	2.81	0.00	1.12	0.00	0.00	4.49	0.00	0.00	3.93	2.81
52	1.06	2.13	1.06	0.00	3.19	0.00	0.00	0.00	0.00	0.00	0.00	1.06	1.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.26	0.00	0.00	0.00	0.00	0.00	0.00	2.13
53	1.15	0.00	0.57	0.00	0.57	0.00	0.00	0.00	0.00	0.00	0.57	0.00	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.72	1.15	0.00	1.15	0.00	0.00	0.00	0.00	0.00	3.45	1.15
54	0.00	0.00	1.30	0.00	0.00	0.65	0.00	0.00	0.65	0.00	0.00	0.00	0.98	0.00	0.00	0.00	0.65	3.58	0.00	0.98	0.00	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.28	1.63
55	0.00	0.00	1.05	0.00	0.00	0.79	0.00	1.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
56	0.00	0.00	0.89	0.00	0.00	0.89	0.00	0.00	1.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.67	0.00	0.89	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.78
57	0.88	1.77	0.88	0.00	0.88	0.00	0.00	0.00	0.00	0.00	0.88	0.00	0.00	1.77	0.00	0.00	0.00	0.00	0.00	0.88	0.00	0.00	0.00	0.00	1.77	0.00	1.77	0.00	0.88	3.54	0.00
58	2.02	2.02	3.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.01	3.03	0.00	0.00	0.00	0.00	0.00	1.01	0.00	0.00	0.00	0.00	1.01	0.00	0.00	0.00	2.02	2.02	1.01
59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.48	0.00	2.58	0.00	0.00	0.00	0.00	0.00	0.00	4.80	0.00	0.00	0.00	1.85
60	0.00	1.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.69	0.00	0.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
61	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.91
62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.76	0.00	4.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Table 14.2: Features faunas. Final list 172 taxa, used in CANOCO analysis
For sample details see Table 14.1; for list of abbreviations see Table 14.3.

No.	Ano scu	Ano nit	Ano corr	Ano tet	Anotylu	Oxytelu	Oxy scu	Pla are	Pla cor	Pla nit	Platyst	Euseeth	Stenus	Rugilus	Lithoch	Lathrob	Leptaci	Gyr fra	Gyrohyp	Xan lin	Xanthol	Neobisn	Philont	Phifoul	Cre max	Staphid	Quedius	Tachypo	Tachinu	Dru can	Falagri
2	0.00	0.00	0.00	1.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	2.08	1.04	1.56	1.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.08	0.00	0.00	0.00	0.00	0.00	0.52	0.00	0.00	0.00	0.00	0.00	0.00	2.60	0.00	0.00	0.52	0.00	0.00
5	0.00	1.09	0.00	0.00	0.00	0.00	0.55	2.19	0.00	0.00	0.00	0.00	1.09	0.00	0.00	0.00	0.00	0.00	1.09	0.00	0.00	0.55	7.65	1.64	0.00	0.00	0.00	0.00	1.64	0.00	0.00
9	0.00	0.00	1.10	0.00	0.00	0.00	3.66	1.47	0.00	0.00	0.00	0.00	2.56	0.00	2.56	0.00	2.20	0.00	0.00	0.00	0.00	1.10	3.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.93
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.00	0.00	1.50	0.00	0.00	0.00	0.00	0.00	0.00
15	0.53	0.53	0.53	0.53	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.53	0.00	0.00	0.53	2.14	8.02	0.00	0.53	1.60	0.00	1.07	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.04	0.00	0.00	0.00	2.59	1.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.04	0.00	0.00	1.04	0.00	0.00	0.00	0.00	1.04
20	0.00	2.33	3.49	1.16	0.00	0.00	0.00	0.00	1.16	0.00	1.16	0.00	0.00	0.00	0.00	0.00	1.16	3.49	1.16	0.00	0.00	0.00	1.16	0.00	0.00	5.81	0.00	0.00	0.00	0.00	0.00
21	0.62	4.35	4.97	0.00	0.00	0.00	3.73	10.56	1.24	0.62	0.00	0.00	1.24	0.00	0.00	0.00	0.62	0.62	0.00	0.00	0.62	3.73	3.73	0.00	0.00	1.24	0.00	0.00	0.00	0.00	1.86
24	1.14	0.00	0.00	0.00	0.00	0.00	0.00	1.14	0.00	0.00	0.00	0.00	6.82	0.00	0.00	0.00	0.00	1.14	0.00	0.00	1.14	0.00	6.82	0.00	0.00	0.00	0.00	1.14	0.00	0.00	0.00
27	1.09	4.35	0.00	0.00	1.63	0.00	0.00	2.72	0.00	0.00	0.00	0.00	2.72	0.00	0.54	0.00	0.00	0.00	0.00	2.17	1.09	2.17	1.09	0.00	0.00	0.00	1.09	1.63	0.00	0.00	0.54
30	10.58	5.77	10.58	5.77	0.00	0.00	0.00	0.00	0.96	0.96	0.00	0.00	0.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.96	0.00	0.00	0.96	0.96	0.00	1.92	0.00	0.00
32	2.73	2.73	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.73	2.73	0.91	0.00	0.91	1.82	1.82	1.82	0.00	0.91	0.00	0.91	0.00	0.00
33	0.00	0.00	0.98	0.00	0.00	0.00	3.92	0.00	0.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.43	8.33	0.00	0.00	1.96	0.00	0.00	0.00	0.00
35	0.00	0.99	0.00	1.98	0.00	0.00	0.00	0.99	0.00	0.00	0.00	0.00	1.98	0.99	0.00	0.00	0.00	0.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.99	0.00	0.00	0.00
36	0.00	1.70	0.00	0.00	0.00	0.00	1.70	1.70	1.70	1.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.70	0.00	0.00	0.00	0.00	3.40
37	0.78	0.00	0.00	0.00	0.00	0.00	0.00	0.39	0.39	0.78	0.00	0.00	1.17	0.39	0.00	0.00	0.00	0.39	0.00	0.39	0.00	0.00	0.78	0.39	0.00	0.00	0.00	0.39	0.39	0.00	0.00
38	1.29	3.87	0.65	1.29	0.00	0.00	0.65	3.23	2.58	1.29	0.00	0.00	2.58	1.29	0.00	0.65	0.00	0.00	0.00	0.00	0.00	0.65	0.00	0.00	0.00	1.94	0.00	0.65	0.00	0.00	0.65
39	0.00	0.93	0.00	0.00	0.00	0.00	0.93	0.93	0.93	0.93	0.00	0.00	3.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.93	0.00	1.85	0.00	0.00	0.93	0.00	1.85	0.00	0.00	1.85
40	0.00	11.68	1.46	0.00	0.00	0.00	0.00	11.68	11.68	2.19	0.00	0.00	2.92	0.00	0.00	0.00	0.00	1.46	0.00	0.00	0.00	0.00	1.46	0.00	0.00	0.00	0.00	0.00	2.92	0.00	1.46
41	0.00	1.18	1.78	0.00	0.00	0.00	2.96	2.96	1.18	1.78	0.00	0.00	1.18	0.00	0.00	0.00	0.00	1.18	0.00	1.78	0.00	0.00	1.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
42	0.00	1.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.25	0.00	0.00	0.00	0.00	0.00	0.00	1.95	0.00	0.00	1.95	0.00	0.00	0.00	0.00	2.27	0.00	0.00	0.00
43	1.31	0.00	0.00	0.00	0.00	0.00	1.31	0.00	0.00	0.00	0.00	0.00	1.31	0.00	0.00	0.00	0.00	0.00	0.00	2.61	0.00	0.00	1.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
44	1.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.92	0.00	0.00
45	0.00	0.00	0.00	0.00	0.00	0.00	1.10	1.10	0.00	0.00	1.65	0.00	1.37	0.00	0.00	0.00	0.00	0.82	0.82	0.00	0.00	0.00	1.65	1.92	0.00	1.65	0.00	0.00	1.65	0.00	0.00
46	0.00	0.00	0.00	0.85	0.00	0.85	0.85	1.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.85	0.85	0.00	1.69	0.00	0.00	0.00	2.54	0.00	0.00	0.85	0.00	0.00
47	0.00	8.08	0.00	0.00	0.00	0.00	0.00	1.15	0.00	0.00	0.00	0.00	1.15	0.00	0.00	0.00	0.00	1.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.15	0.00	1.54	0.00	0.00	0.00
48	3.51	3.51	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.63	0.00	0.00	0.00	0.00	0.00	0.00	2.63	0.88	0.00	1.75	0.88	0.00	0.88	0.88	1.75	2.63	0.00	0.00
49	1.84	0.84	0.00	0.00	0.00	0.00	0.00	0.75	10.36	3.43	0.00	0.00	8.77	0.00	0.00	2.17	0.00	0.00	0.00	1.50	0.00	0.00	1.92	0.00	0.00	0.00	0.00	2.17	1.00	0.67	0.00
50	8.26	0.00	0.00	0.00	0.00	0.83	0.00	0.00	0.00	0.00	0.00	0.00	3.31	0.83	0.00	2.48	0.00	0.83	0.00	0.83	0.00	0.00	0.00	0.00	0.00	0.00	3.31	0.00	0.00	0.83	1.65
51	3.93	0.00	1.12	0.00	0.00	0.00	0.00	0.00	0.56	1.69	0.00	0.00	0.56	0.00	0.00	0.00	0.00	0.00	0.00	1.69	0.00	0.00	1.12	0.00	0.00	0.00	0.00	0.56	2.25	0.00	0.00
52	0.00	0.00	0.00	1.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.19	0.00	1.06	0.00	0.00	1.06	1.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
53	2.87	1.15	0.00	1.15	0.00	0.00	1.15	0.00	4.02	7.47	1.15	0.00	1.15	0.00	0.00	0.00	0.00	1.15	0.00	1.72	0.00	0.00	1.72	0.00	0.00	0.00	0.57	0.00	1.15	0.00	0.57
54	2.61	3.91	0.00	2.28	1.30	3.91	0.00	0.98	4.89	2.93	0.00	0.00	0.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.63	0.00	0.98	0.65	0.00	0.00	0.00	0.65	0.00	0.00	1.95
55	2.88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.83	1.31	0.00	1.83	0.00	0.00	1.05	0.00	0.00	2.62	0.00	0.00
56	4.44	0.00	0.00	0.00	0.00	0.00	0.00	1.78	1.78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.89	1.33	0.00	0.00	2.22	0.00	0.00	0.00	0.00	0.00	1.78	0.00	0.00
57	0.00	1.77	0.00	0.00	0.00	0.00	1.77	3.54	0.00	0.00	0.00	0.88	0.00	0.00	0.00	0.88	1.77	0.00	0.00	0.00	0.00	0.00	1.77	0.00	0.00	0.88	0.00	0.00	0.00	0.00	0.00
58	1.01	1.01	0.00	0.00	0.00	0.00	0.00	1.01	1.01	1.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.02	0.00	0.00	0.00	1.01	0.00	0.00	0.00	0.00	2.02	0.00	0.00	1.01
59	4.06	0.00	0.00	0.00	0.00	0.00	0.00	1.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
60	9.48	0.00	0.00	0.00	0.00	0.00	0.00	1.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.02	0.00	1.52	0.00	0.00	2.54	0.00	0.00	0.00	0.00	0.00	1.52	0.00	0.00
61	3.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.55	0.00	0.00
62	0.76	0.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.76	0.00	0.00	0.76	0.00	0.00	0.76	0.00	0.00	0.00	0.00	0.00

Table 14.2: Features faunas. Final list 172 taxa, used in CANOCO analysis
For sample details see Table 14.1; for list of abbreviations see Table 14.3.

No.	Cordail	Cil sil	Aleocha	Aleocin	Euplect	Pselfid	Canth	Agriot	Agr mur	Athous	Elatrid	Scirtid	Cyphon	Dryops	Dermest	Kat ruf	Brachyp	Meliget	Omosita	Rhizoph	Rhi par	Monotor	Cry sur	Cry fer	Cryptop	Atomari	Phalacr	Lat min	Enicmus	Eph glo	Dienere
2	0.00	0.00	0.00	9.34	1.10	1.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.65	0.00	1.10	0.00	1.65	0.00	0.00	6.59	6.59	4.40	2.20	0.00	7.14	3.85	0.00	0.00
4	0.00	0.00	0.00	18.75	12.50	0.00	0.00	0.00	0.00	0.00	0.52	0.00	0.00	0.00	0.00	0.00	0.00	0.52	0.00	0.00	9.38	0.00	1.04	0.52	1.56	1.04	0.00	3.65	0.00	0.00	0.00
5	0.55	0.00	2.19	13.66	0.00	0.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.55	0.00	0.00	0.00	0.00	0.00	5.46	3.28	0.00	6.01	0.00	0.00	0.00
9	0.00	0.00	0.00	7.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.66	7.33	0.00	6.96	0.00	0.00	0.00
12	0.00	0.00	0.00	12.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	0.00	5.50	3.00	0.00	7.50	0.00	1.00	0.00
15	0.00	0.00	0.00	8.02	1.07	0.00	0.00	0.00	0.00	0.00	0.53	0.00	0.00	0.00	1.60	0.00	0.00	0.00	0.00	0.00	0.53	0.00	3.21	0.00	4.28	3.21	0.00	8.02	0.00	0.00	0.00
18	0.00	0.00	0.00	5.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.88	10.88	15.03	3.11	0.00	10.88	0.00	0.00	0.00
20	0.00	0.00	0.00	9.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.65	1.16	1.16	10.47	0.00	0.00	1.16
21	0.62	0.00	0.00	8.07	0.00	0.62	0.00	0.00	0.00	0.00	0.62	0.00	0.00	0.00	0.00	0.00	0.00	0.62	1.24	0.00	0.00	0.00	0.00	0.00	0.62	1.24	0.00	3.73	0.00	0.00	0.00
24	0.00	0.00	0.00	1.14	0.00	1.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.14	1.14	6.82	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	13.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.09	0.00	0.00	1.09	0.00	0.00	0.00
30	0.00	0.00	0.00	9.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.85	1.92	0.00	0.00	0.00	0.00	0.00
32	0.00	0.00	0.91	6.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.82	0.00	0.00	0.00	7.27	1.82	0.00	6.36	0.00	2.73	0.00
33	0.00	0.00	0.98	5.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.98	0.00	0.00	0.00	0.00	0.00	10.78	4.90	0.00	4.41	0.00	0.00	0.00
35	0.00	0.00	0.00	7.92	0.00	0.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.99	0.99	0.00	0.00	0.00	0.00	5.94	3.96	1.98	3.96	0.00	9.90	0.99	0.99	0.00
36	0.00	0.00	0.00	5.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.10	5.10	1.70	1.70	0.00	5.10	1.70	0.00	0.00
37	0.00	0.00	0.00	3.13	0.00	0.00	0.39	0.78	0.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.78	0.39	0.78	0.00	0.00	0.00	0.00	0.00	1.56	0.78	0.00	0.00	0.00	0.00	0.00
38	1.29	0.00	0.00	14.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.65	0.00	0.00	0.00	0.65	0.00	0.00	0.00	0.00	7.74	4.52	0.00	0.00	0.00	0.00	0.00	0.65	0.00
39	0.00	0.00	0.00	4.63	0.00	0.00	0.00	0.00	0.00	0.00	0.93	0.00	0.00	0.00	0.00	0.00	0.93	0.93	2.78	0.00	0.00	0.00	4.63	1.85	1.85	0.93	0.93	2.78	0.00	0.93	0.00
40	0.00	0.00	0.00	7.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.92	2.92	0.00	0.00	0.00	0.00	0.00
41	0.00	1.18	0.00	5.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.55	2.37	0.00	4.73	0.00	0.00	0.00
42	0.00	0.00	0.00	6.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.30	0.00	0.00	0.00	0.00	0.00	1.30	0.00	0.00	0.00	0.00	11.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
43	0.00	0.00	0.00	6.54	0.00	1.31	0.00	0.00	0.00	0.00	0.00	0.00	2.61	0.00	0.00	0.00	0.00	1.96	0.00	0.00	0.00	0.00	0.00	0.00	1.96	0.00	0.00	0.00	0.00	0.00	0.00
44	0.00	0.00	0.00	3.07	0.00	0.00	0.92	0.00	0.00	0.00	0.00	1.84	0.00	0.00	0.00	0.00	0.00	1.84	0.00	1.84	0.00	0.92	0.00	0.00	0.00	0.00	0.00	4.29	0.00	0.00	2.15
45	0.00	0.00	0.00	2.75	0.00	0.00	0.00	0.82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.42	0.00	0.00	0.00	0.00	1.37	0.00	0.00	0.00	0.82	0.00	3.02	0.00	0.00	0.00
46	0.00	0.00	0.85	2.54	0.00	0.00	0.00	0.00	0.00	0.00	0.85	0.00	0.00	0.00	0.00	0.00	0.00	1.69	0.00	0.00	0.00	1.69	2.54	0.85	5.08	0.85	0.00	5.93	0.00	0.85	0.85
47	0.00	0.00	0.00	3.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.77	0.77	0.00	0.00	0.00	7.31	10.38	2.69	4.62	0.00	6.54	1.54	1.54	0.00
48	0.00	0.00	0.00	6.14	0.00	0.00	0.00	2.63	0.88	1.75	0.88	0.00	0.00	0.00	0.00	0.00	2.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.75	0.00	0.00	0.00	1.75	0.00
49	0.00	0.00	0.00	1.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.75	0.00	0.00	0.00	0.00	0.00	0.00	1.09	2.01	0.00	0.00	0.00	2.42	0.00	0.00	0.00
50	0.00	0.00	0.00	4.96	0.00	0.00	0.00	3.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.65	0.00	0.00	0.00	0.00	0.00
51	0.00	0.00	0.00	3.37	0.00	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.99	2.25	0.56	4.49	0.00	0.00	0.00
52	0.00	0.00	0.00	9.57	2.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.06	0.00	0.00	9.57	19.15	0.00	8.51	1.06	0.00	0.00
53	0.00	0.00	0.00	4.02	0.57	1.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.30	0.57	0.00	1.15	0.00	0.00	0.57	0.00	2.30	1.15	0.00	1.72	0.57	0.00	0.00
54	0.00	0.00	0.00	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.30	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.65	0.00	0.00	0.00	0.00	0.00	4.56	0.00	0.00	0.00
55	0.00	0.00	0.00	6.54	0.00	0.00	0.79	1.83	0.00	0.00	1.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.83	0.00	1.31	0.00	0.00
56	0.00	0.00	0.00	6.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.33	0.00	2.22	0.89	0.00	0.00	0.00
57	0.00	0.88	0.00	3.54	0.00	0.88	0.00	0.00	0.00	0.00	0.88	0.00	0.88	0.00	0.00	0.88	0.00	0.88	0.00	0.00	0.00	5.31	10.62	0.88	1.77	0.88	0.00	4.42	0.00	0.00	0.00
58	0.00	0.00	1.01	6.06	0.00	1.01	0.00	0.00	0.00	0.00	1.01	0.00	0.00	0.00	0.00	0.00	2.02	0.00	0.00	0.00	0.00	1.01	7.07	4.04	3.03	0.00	0.00	4.04	3.03	0.00	0.00
59	0.00	0.00	0.00	7.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.32	0.00	0.00	12.92	0.00	0.00	0.00
60	0.00	0.00	0.00	5.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.68	0.00	0.00	0.00	0.00	0.00	0.00	1.69	0.00	0.00	3.21	0.00	0.00	0.00
61	0.00	0.00	0.00	4.55	0.00	0.00	1.82	4.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.45	0.00	0.00	0.00
62	0.00	0.00	0.00	4.55	0.00	0.00	0.00	1.52	0.00	0.00	0.00	0.00	0.00	2.27	0.00	0.00	0.00	0.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.64	0.00	0.00	0.00

Table 14.2: Features faunas. Final list 172 taxa, used in CANOCO analysis
For sample details see Table 14.1; for list of abbreviations see Table 14.3.

No.	Cortica	Cortcin	Typ ste	Agi bru	Myc hir	Coocid	Lyc lin	Ano pun	Tip uni	Pti fur	Ptinus	Anthicu	Blaps	Pal rat	Ten obs	Tro sca	Geotrup	Onthophr	Oxy syl	Aph pro	Aph gra	Aphodiu	Phy hor	Loc sut	Chrtree	Longita	Haltcin	Chaetoc	Cha con	Chrywat	Chrwet
2	1.10	0.00	0.00	1.10	0.00	0.00	0.00	7.14	5.49	4.40	0.00	0.00	0.00	1.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	1.56	0.00	0.00	0.00	0.00	0.00	1.56	2.08	0.00	0.52	0.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.55	1.09	0.00	1.09	1.64	0.00	0.55	1.09	0.00	0.55	0.00	0.55	1.09	0.00	0.00	0.00	0.00	0.00	1.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	3.30	2.93	0.73	3.66	3.30	1.83	0.00	3.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	1.00	0.00	0.00	3.00	7.50	0.00	7.50	7.50	1.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	1.60	0.00	0.00	0.00	3.21	1.07	8.02	8.02	1.60	0.00	0.00	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.53	0.00	0.00	0.00	0.00
18	1.04	0.00	3.63	0.00	0.00	0.00	0.00	2.07	1.04	0.00	0.00	0.00	0.00	3.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	5.81	0.00	0.00	0.00	0.00	0.00	0.00	1.16	0.00	0.00	1.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.62	0.00	0.00	0.62	0.00	0.00	0.00	2.48	0.00	1.24	0.00	0.00	0.00	0.00	0.62	0.62	0.62	0.00	1.24	0.00	0.00	1.24	0.00	0.00	0.62	0.00	0.00	0.00	0.00	0.62	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	1.14	1.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.14	0.00	0.00	0.00	0.00	0.00	0.00	1.14	1.14	0.00
27	1.63	0.00	0.00	0.00	5.98	0.00	1.09	4.89	0.00	0.00	1.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.72	0.00	0.00	0.54	0.00	0.00	0.00	1.63	1.63	0.54
30	0.00	1.92	0.00	0.00	0.00	0.00	0.00	2.88	0.00	0.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
32	0.00	0.91	0.00	0.00	0.91	0.00	0.00	5.45	0.00	0.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.73	0.00	1.82	1.82	0.00	0.00	0.00	0.91	0.00	0.00	0.91	0.00	0.00
33	0.00	0.00	0.00	3.92	10.29	0.00	0.00	2.45	0.98	0.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
35	5.94	5.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.99	0.99	0.00	0.00	0.00	0.00	0.00	0.00	1.98	0.00	0.99	0.00	0.00	0.00	0.00	3.96	0.00	0.00
36	0.00	0.00	0.00	1.70	0.00	0.00	0.00	5.10	0.00	0.00	0.00	1.70	0.00	0.00	0.00	0.00	0.00	0.00	1.70	0.00	5.10	5.10	0.00	0.00	0.00	0.00	1.70	0.00	0.00	0.00	0.00
37	0.00	0.00	0.00	0.00	0.00	0.00	0.39	1.56	0.00	0.78	0.00	0.39	0.00	0.00	0.00	0.00	0.00	0.00	1.56	0.00	0.00	0.00	3.52	0.00	0.00	0.00	0.39	0.00	0.39	0.00	0.00	0.00
38	0.00	1.29	0.00	0.00	0.00	0.00	0.00	0.65	0.00	0.00	1.29	0.00	0.00	0.65	0.00	0.00	0.00	0.00	0.65	0.00	0.65	2.58	0.65	0.00	0.00	0.00	0.00	0.00	0.65	0.00	0.00
39	0.00	3.70	0.93	0.93	0.00	0.00	0.00	1.85	0.00	0.00	0.00	0.00	0.00	0.93	0.93	0.00	0.00	0.00	0.00	6.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.93	1.85	0.00	0.00
40	0.00	2.92	0.00	0.00	0.00	0.00	1.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.65	2.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
41	0.00	5.33	1.18	0.00	1.78	0.00	0.00	6.51	0.00	3.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.37	1.18	0.00	1.18	0.00	0.00	0.00	0.00	0.00	0.00	1.78	0.00	0.00
42	1.95	0.00	0.00	0.00	3.25	0.00	0.00	4.87	1.62	0.00	0.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.27	0.00	0.00	0.00	5.19	0.00	0.00	1.30	0.00	0.00
43	0.00	0.00	0.00	0.00	1.96	1.31	0.00	3.92	6.54	3.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.92	0.00	0.00	0.00	0.00	0.00	0.00	1.96	0.00	1.31
44	1.53	0.92	0.00	0.00	0.92	0.00	0.00	0.92	0.00	1.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.07	0.00	0.00	0.00	1.84	0.00	0.92	1.23	0.92	0.00
45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.57	0.00	0.82	2.20	1.10	0.00	0.00	0.00	0.00	0.00	0.00	1.10	0.27
46	4.24	0.00	2.54	0.00	0.00	0.00	0.00	5.93	0.00	3.39	0.00	0.85	0.00	0.85	0.00	0.00	0.85	0.00	0.00	0.00	0.00	7.63	2.54	0.85	0.00	2.54	0.00	0.00	0.00	0.00	0.00
47	1.15	1.54	0.00	0.00	0.00	0.00	0.00	7.69	1.92	1.15	0.00	0.77	0.00	2.31	0.00	0.00	0.00	0.00	1.54	0.00	6.15	2.31	0.00	0.00	0.00	0.00	0.00	0.00	0.77	0.00	0.00
48	0.00	1.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.88	0.00	0.00	0.00	0.00	10.53	0.88	0.00	0.00	2.63	0.00	0.00	0.00	0.00	0.00
49	1.34	0.00	0.00	0.00	0.00	0.00	0.00	1.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.84	0.00	3.17	3.68	0.00	0.00	0.00	4.26	0.00	1.59	1.25	0.00	0.00
50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.48	0.83	0.00	0.00	0.00	0.00
51	0.00	0.56	0.00	0.00	0.00	0.00	0.00	2.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.56	0.56	0.00	0.00	0.00	1.69	0.00	0.00	0.56	0.00	0.56
52	0.00	0.00	0.00	10.64	1.06	0.00	0.00	0.00	0.00	0.00	1.06	1.06	1.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
53	0.00	1.72	0.00	0.57	0.00	0.00	0.57	4.02	1.15	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.57	4.02	1.15	0.00	4.60	0.00	0.00	0.00	0.57	0.00	0.00	0.00	0.00	0.00
54	0.00	2.61	0.00	0.00	0.00	0.00	0.00	1.63	1.63	0.00	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.93	3.26	0.65	0.00	0.00	0.00	0.00	0.65	1.30	0.00	0.00
55	0.00	1.83	0.00	0.00	0.00	1.57	0.00	0.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.31	0.00	2.09	0.00	4.97	0.00	0.00	0.00	1.57	0.00	0.00	1.57	0.00	1.83
56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.67	0.00	0.00	8.44	0.00	0.00	0.00	0.89	0.00	0.00	0.00	0.00	0.00
57	0.88	0.00	0.00	0.88	0.00	0.00	0.00	6.19	0.88	0.00	0.00	10.62	0.88	0.88	0.88	0.88	0.00	0.00	0.00	0.00	0.00	1.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
58	0.00	1.01	0.00	0.00	0.00	0.00	0.00	3.03	2.02	0.00	1.01	0.00	1.01	1.01	0.00	1.01	0.00	1.01	0.00	0.00	0.00	4.04	1.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
59	0.00	5.17	0.00	0.00	0.00	0.00	0.00	4.06	0.00	2.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.48	0.00	0.00	0.00	0.00	0.00	0.00	3.32	0.00	0.00	0.00
60	0.00	2.03	0.00	0.00	0.00	0.00	0.00	3.55	1.35	4.91	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.52	0.00	0.00	4.91	0.00	0.00	0.00	0.00	0.00	0.00	2.88	0.00	0.00	0.00
61	0.00	7.27	0.00	0.00	0.00	0.00	0.00	7.27	0.00	9.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
62	0.00	1.52	0.00	0.00	0.00	0.00	0.00	5.30	0.00	1.52	0.00	0.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.52	0.00	3.03	0.00	0.00	1.52	0.00	0.00	0.00	3.03	0.76	0.00

Table 14.2: Features faunas. Final list 172 taxa, used in CANOCO analysis
For sample details see Table 14.1; for list of abbreviations see Table 14.3.

No.	Chrweec	Chrymid	Bru ruf	Bruchus	Lep var	Apion	Apiweed	Sitona	Not acr	Sit gra	Tan lem	Cid qua	Ceutrhy	Curtree	Curweec	Curchy	Curcid
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.75	0.00	0.00	0.00	0.00	0.00	0.00	4.95
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.52	0.00	0.00	0.00	0.00	1.04	0.00	0.00	0.00	0.00
5	0.00	1.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.55
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	1.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	2.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.16
21	0.62	0.00	1.86	0.00	0.00	0.62	0.00	0.00	0.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.24
24	0.00	1.14	0.00	1.14	0.00	3.41	0.00	1.14	1.14	0.00	6.82	0.00	0.00	0.00	0.00	0.00	1.14
27	1.63	0.00	0.00	0.00	0.00	4.35	0.00	0.00	0.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	7.69	0.00	4.81	0.00	0.00	0.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.92
32	0.00	0.00	3.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
33	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
35	0.00	0.99	0.00	0.00	0.00	0.00	0.00	1.98	0.00	0.99	0.00	0.00	0.00	0.00	0.00	0.00	5.94
36	0.00	2.04	0.00	0.00	0.00	1.70	0.00	0.00	0.00	5.10	0.00	0.00	0.00	0.00	0.00	0.00	2.04
37	1.17	0.00	0.00	0.00	0.00	0.78	0.00	0.00	0.00	0.39	0.39	0.00	0.00	0.00	0.00	0.00	2.34
38	1.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.29	1.29	0.00	0.00	1.29	0.00	0.00	0.00	1.29
39	0.93	0.00	0.00	0.93	0.00	0.00	0.00	0.00	0.00	0.93	0.00	0.00	0.00	0.00	0.00	0.00	0.93
40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
41	0.00	0.00	1.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.18	0.00	0.00	0.00	0.00
42	1.62	0.00	0.00	0.00	0.00	1.95	0.97	0.97	0.00	3.90	0.00	0.00	8.77	0.00	0.00	4.22	0.00
43	2.61	0.00	0.00	0.00	1.31	2.61	0.00	1.31	0.00	1.96	0.00	0.00	2.61	1.96	0.00	0.00	1.31
44	0.92	0.92	0.00	0.00	0.00	3.37	0.00	1.53	0.00	0.00	0.00	0.00	0.00	0.00	0.92	0.00	0.00
45	0.00	0.00	0.00	0.00	0.00	1.65	0.00	0.00	0.00	0.00	0.82	2.75	1.92	0.00	0.00	0.00	0.00
46	0.85	0.00	0.00	0.00	0.00	0.85	0.00	0.85	0.85	0.85	0.00	0.00	0.00	0.00	0.00	0.00	3.39
47	0.77	0.00	0.00	0.00	0.00	1.15	0.00	0.00	0.00	2.31	0.00	0.00	0.77	0.00	0.77	0.00	0.00
48	1.75	0.88	0.00	0.00	0.00	2.63	0.00	0.00	0.00	0.00	0.00	0.88	0.88	0.00	1.75	1.75	0.88
49	3.76	0.00	0.00	0.00	0.00	1.25	0.75	2.01	0.00	0.67	0.00	0.00	1.34	0.00	1.50	0.00	0.00
50	0.00	0.00	0.00	0.00	0.00	1.65	1.65	0.00	0.00	0.00	0.00	10.74	0.00	1.65	4.13	0.00	4.13
51	15.17	0.00	0.00	1.12	0.00	0.56	0.00	1.12	1.12	0.00	0.00	0.00	1.69	0.00	0.00	0.00	1.12
52	0.00	1.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
53	1.15	0.57	0.00	0.57	0.00	1.72	0.00	0.00	0.00	0.00	0.00	0.00	2.30	0.00	1.15	0.00	1.72
54	4.56	0.00	0.00	0.00	9.45	1.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.65	0.00	0.65
55	2.88	0.00	0.00	0.00	0.00	8.90	0.00	1.57	0.00	0.00	0.00	0.00	2.88	0.00	0.00	0.00	3.14
56	2.67	1.33	0.00	0.00	0.00	8.89	2.67	0.89	0.00	0.00	0.00	0.00	3.56	0.00	1.78	0.00	1.33
57	0.00	0.00	0.00	0.00	0.00	0.88	0.00	0.00	0.00	1.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00
58	0.00	2.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.03	0.00	0.00	2.02	0.00	0.00	0.00	3.03
59	2.21	0.00	0.00	1.48	0.00	12.92	0.00	2.21	0.00	0.00	0.00	0.00	1.48	1.11	0.00	0.00	0.00
60	0.85	0.00	0.00	0.00	0.00	8.12	0.00	1.52	0.00	0.00	0.00	0.00	2.03	0.68	0.00	0.00	0.00
61	1.82	0.00	0.00	0.00	0.00	3.64	0.00	1.82	0.00	0.00	0.00	0.00	3.64	0.91	0.00	0.00	0.00
62	3.79	0.00	0.00	0.00	0.00	1.52	0.00	1.52	6.06	0.00	0.76	0.00	2.27	0.76	0.00	0.76	0.00

Table 14.3: Features faunas. Names of taxa used in CANOCO analysis and eco-codes used. For explanation of eco-codes see Fig. 6.1.

Nse. = Members of the taxon not specified elsewhere or unspecified

Taxonomic name	**CANOCO name**	**ECO CODE**
Dyschirius spp.	Dyschir	GD C
Notiophilus spp.	Notioph	GX C
Clivina spp.	Clivina	GD B
Trechus quadristriatus group	Tre qua	UU C
Trechus micros (Hbst.)	Tre mic	GD B
Bembidion spp. nse	Bembidi	GD C
Harpalus spp. nse.	Harpalu	GX C
Harpalus (*Ophonus*) spp.	Ophonus	GX C
Harpalus rufipes Deg.	Har ruf	GA C
Pterostichus spp. nse	Pterost	UU C
Pterostichus melanarius (Ill.)	Pte mel	UU C
Pterostichus vernalis (Panz.)	Pte wet	GD C
Pterostichus nigrita (Payk.)	Pte wet	GD C
Pterostichus diligens (Strm.)	Pte wet	GD C
Pterostichus anthracinus (Panz.)	Pte wet	GD C
Pterostichus strenuus (Panz.)	Pte wet	GD C
Pterostichus gracilis (Dej.)	Pte wet	GD C
Calathus spp.	Calathu	GX C
Laemostenus terricola (Hbst.)	Lae ter	HH C
Agonum dorsale (Pont.)	Ago dor	GA C
Amara spp.	Amara	GX C
Leistus terminatus (Hellw.)	Car wet	GD C
Loricera pilicornis (F.)	Car wet	GD C
Trechus rivularis (Gyll.)	Car wet	GD C
Tachys spp.	Car wet	GD C
Stomis pumicatus (Panz.)	Car wet	GD C
Asaphidion flavipes (L.)	Car wet	GD C
Patrobus atrorufus (Strom.)	Car wet	GD C
Bradycellus verbasci (Duft.)	Car wet	GD C
Abax parallelepipedus Pil.	Car wet	GD C

Taxonomic name	CANOCO name	ECO CODE
Gyrinus spp.	Watstag	AS
Cymbiodyta marginella (F.)	Hydstag	AS
Coelostoma orbiculare (F.)	Hydstag	AS
Berosus affinis Brul.	Hydstag	AS
Laccobius biguttatus Gerh.	Hydstag	AS
Hydrochus carinatus Germ.	Hydstag	AS
Hydrochara caraboides (L.)	Hydstag	AS
Helochares punctatus Sharp	Hydstag	AS
Helophorus spp. nse.	Helopho	AS
Sphaeridium spp.	Sphaeri	DF
Cercyon spp. nse.	Cercyon	DU
Cercyon analis (Payk.)	Cer ana	DC
Cercyon haemorrhoidalis (F.)	Ce foul	DF
Cercyon melanocephalus (L.)	Ce foul	DF
Cercyon unipunctatus (L.)	Ce foul	DF
Cercyon terminatus (Marsh.)	Ce foul	DF
Cercyon atricapillus (Marsh.)	Ce foul	DF
Cercyon pygmaeus (Ill.)	Ce foul	DF
Cercyon lateralis (Marsh.)	Ce foul	DF
Cercyon quisquilius (L.)	Ce foul	DF
Megasternum obscurum (Marsh.)	Meg obs	DU
Cryptopleurum spp.	Crypto	DF
Acritus nigricornis (Hoff.)	Acr nig	DF
Histeridae nse.	Histid	DU
Silpha spp.	Silpha	UU
Ptomaphagus spp.	Leiodid	DU N
Catops/Choleva spp.	Catops	DU N
Clambus spp.	Clambus	DC
Scydmaenidae spp.	Scydmid	DU
Orthoperus spp.	Orthope	DC
Ptenidium spp.	Ptenidi	DX M
Acrotrichis spp.	Acrotri	DX M
Ptiliidae spp nse.	Ptiliid	DX M
Micropeplus spp.	Microp e	DC M

Taxonomic name	CANOCO name	ECO CODE
Agonum albipes (Payk.)	Car wet	GD C
Agonum muelleri (Hbst.)	Car wet	GD C
Agonum viduum (Panz.)	Car wet	GD C
Badister sodalis (Duft.)	Car wet	GD C
Acupalpus spp.	Car wet	GD C
Bembidion lampros (Hbst.)	Car dry	GX C
Lebia chlorocephala (Hoff)	Car dry	GX C
Olisthopus rotundatus (Payk.)	Car dry	GX C
Dromius notatus Steph.	Car dry	GX C
Metabletus spp.	Car dry	GX C
Brachinus spp.	Car dry	GX C
Bradycellus ruficollis (Steph.)	Car dry	GX C
Carabidae spp. nse.	Carabid	UU C
Dytiscus spp.	Dytstag	AS
Rhantus spp.	Dytstag	AS
Colymbetes fuscus (L.)	Dytstag	AS
Noterus crassicornis (Müll.)	Dytstag	AS
Hygrotus versicolor (Sch.)	Dytstag	AS
Hydraenidae spp. nse.	Hydraed	AA
Hydrophilinae spp. nse.	Hydrfin	AA
Hydroporinae spp.	Hydropn	AA
Agabus/Ilybius spp.	Aga Ily	AA
Laccobius striatulus (F.)	Watflow	AA
Oreodytes spp.	Watflow	AA
Limnebius truncatellus (Thunb.)	Watflow	AA
Noterus clavicornis (Deg.)	Water	AA
Hydrobius fuscipes (L.)	Water	AA
Enochrus spp.	Water	AA
Anacaena spp.	Water	AA
Laccobius spp. nse.	Water	AA
Helochares spp. nse.	Water	AA
Hygrotus spp.	Water	AA
Chaetarthria seminulum (Hbst.)	Water	AA
Haliplus spp.	Watstag	AS

Taxonomic name	CANOCO name	ECO CODE
Megarthrus spp.	Megarth	DU
Lesteva spp.	Lesteva	GD
Phyllodrepa spp.	Phyllod	UU
Omalium spp. nse.	Omalium	DU
Omalium caesum Grav.	Oma cae	DF
Omalium rivulare (Payk.)	Oma riv	DU
Omalium allardi Fairm.& Bris	Oma all	DF
Xylodromus concinnus (Marsh.)	Xyl con	DX
Xylodromus spp. nse.	Xylodro	DX
Coprophilus striatulus (F.)	Cop str	DF B
Carpelimus bilineatus Steph.	Car bil	DC
Carpelimus fuliginosus (Grav.)	Car ful	DC
Carpelimus pusillus (Grav.)	Car pus	DC
Carpelimus spp. nse.	Carpeli	UU
Anotylus rugosus (F.)	Ano rug	DU
Anotylus sculpturatus (Grav.)	Ano scu	DF
Anotylus nitidulus (Grav.)	Ano nit	DU
Anotylus complanatus (Er.)	Ano com	DF
Anotylus tetracarinatus Block	Ano tet	DF
Anotylus spp. nse.	Anotylu	DU
Oxytelus spp. nse.	Oxytelu	DF
Oxytelus sculptus Grav.	Oxy scu	DF
Platystethus arenarius (Fourc.)	Pla are	DF
Platystethus cornutus (Grav.)	Pla cor	GD
Platystethus degener Muls. & Rey	Pla deg	DF
Platystethus nitens (Sahl.)	Pla nit	GD
Platystethus spp. nse.	Platyst	UU
Euaesthetus spp.	Euaesth	GD
Stenus spp.	Stenus	UU
Rugilus spp.	Rugilus	DC
Lithocharis spp.	Lithoch	DC
Lathrobium spp.	Lathrob	DC
Leptacinus spp.	Leptaci	DC
Gyrohypnus fracticornis (Müll.)	Gyr fra	DF

Taxonomic name	CANOCO name	ECO CODE
Gyrohypnus spp. nse.	Gyrohyp	DU
Xantholinus linearis (Ol.)/*longiventris* Heer	Xan lin	DX
Xantholinus spp. nse.	Xanthol	DU
Neobisnius spp. (probably all *N. villosulus*)	Neobisn	DC
Philonthus spp. nse.	Philont	DU
Philonthus politus (L.)	Phifoul	DF
Philonthus splendens (F.)	Phifoul	DF
Philonthus laminatus (Creutz.)	Phifoul	DF
Philonthus cognatus Steph.	Phifoul	DF
Creophilus maxillosus (L.)	Cre max	DF
Staphylininae spp. nse.	Staphid	UU
Quedius spp.	Quedius	UU
Tachyporus spp.	Tachypo	UU
Tachinus spp.	Tachinu	DF
Drusilla canaliculata (F.)	Dru can	UU
Falagria spp.	Falagri	UU
Cordelia spp.	Cordali	DF
Cilea silphoides (L.)	Cil sil	DF
Aleochara spp.	Aleocha	DF
Aleocharinae spp. nse.	Aleocin	UU
Euplectus spp.	Euplect	GD
Pselaphidae spp. nse.	Pselfid	GD
Cantharis spp.	Canth	UU
Agriotes spp.	Agriot	GP V
Agrypnus murinus (L.)	Agr mur	GP V
Athous spp.	Athous	UU
Elateridae spp. nse.	Elatrid	UU
Scirtidae spp. nse.	Scirtid	GD V
Cyphon spp.	Cyphon	GD V
Dryops spp.	Dryops	AA
Attagenus pellio (L.)	Dermest	DX N
Anthrenus spp.	Dermest	DX N
Kateretes rufilabris (Latr.)	Kat ruf	GD V
Brachypterus spp.	Brachyp	GA V

Taxonomic name	CANOCO name	ECO CODE
Meligethes spp.	Meliget	UU
Omosita spp.	Omosita	DX N
Rhizophagus spp. nse.	Rhizoph	UU
Rhizophagus parallelocollis Gyll.	Rhi par	DF B
Monotoma spp.	Monotom	DX M
Oryzaephilus surinamensis (L.)	Ory sur	FG
Cryptolestes ferrugineus (Steph.)	Cry fer	FG
Cryptophagus spp.	Cryptop	DX M
Atomaria spp.	Atomari	DX M
Phalacrus spp.	Phalacr	GA V
Lathridius minutus group	Lat min	HM M
Enicmus spp.	Enicmus	DX M
Ephistemus globulus (Payk.)	Eph glo	DC M
Dienerella spp.	Dienere	DX M
Corticaria spp.	Cortica	DX M
Corticariinae spp. nse.	Cortcin	DX M
Typhaea stercorea (L.)	Typ ste	HM M
Aglenus brunneus (Gyll.)	Agl bru	HH B
Mycetaea hirta (Marsh.)	Myc hir	HM M
Coccinellidae spp. nse.	Coccid	UU V
Lyctus linearis (Goez.)	Lyc lin	HT
Anobium punctatum (Deg.)	Ano pun	HT
Tipnus unicolor (Pill.)	Tip uni	HM M
Ptinus fur (L.)	Pti fur	HM M
Ptinus spp. nse.	Ptinus	DX M
Blaps spp.	Blaps	HH
Anthicus spp.	Anthicu	DU
Palorus ratzeburgi (Wiss.)	Pal rat	FG
Tenebrio obscurus F.	Ten obs	FF
Trox scaber (L.)	Tro sca	DX N
Geotrupes spp.	Geotrup	GP
Onthophagus spp.	Onthoph	GP
Oxyomus sylvestris (Scop.)	Oxy syl	DU
Aphodius prodromus (Brahm)	Aph pro	DF

Taxonomic name	CANOCO name	ECO CODE
Aphodius granarius (L.)	Aph gra	DF
Aphodius spp. nse.	Aphodiu	GP
Phyllopertha horticola (L.)	Phy hor	GP V
Lochmaea suturalis (Thom.)	Loc sut	GD V
Phymatomes alni (L.)	Chrtree	TT
Rhinosimus planirostris (F.)	Chrtree	TT
Chalcoides spp.	Chrtree	TT
Plagiodera versicolora (Laich.)	Chrtree	TT
Phratora spp.	Chrtree	TT
Longitarsus spp.	Longita	UU V
Halticinae spp. nse.	Haltcin	UU V
Chaetocnema spp. nse.	Chaetoc	UU V
Chaetocnema concinna (Marsh.)	Cha con	GA V
Donacia spp.	Chrywat	AA V
Prasiocuris phellandri (L.)	Chrywat	AA V
Phaedon cochleariae (F.)	Chrywat	AA V
Hydrothassa spp.	Chrwet	GD V
Batophila aerata (Marsh.)	Chrweed	GA V
Gastrophysa viridula (Deg.)	Chrweed	GA V
Gastrophysa polygoni (L.)	Chrweed	GA V
Phyllotreta spp.	Chrweed	GA V
Psylliodes cuprea (Koch)	Chrweed	GA V
Chrysomelidea spp. nse.	Chrymid	UU V
Bruchus rufimanus Bohe.	Bru ruf	FL
Bruchus spp. nse.	Bruchus	FL
Leperisinus varius (F.)	Lep var	TT
Apion spp. nse.	Apion	UU V
Apion (Aspidapion) aeneum (F.)	Apiweed	GA V
Apion (Aspidapion) radiolus (Marsh.)	Apiweed	GA V
Apion (Malvapion) malvae (F.)	Apiweed	GA V
Apion (Ceratapion) carduorum Kirby	Apiweed	GA V
Apion (Eutrichapion) punctigerum (Payk.)	Apiweed	GA V
Sitona spp.	Sitona	UU V
Notaris acridulus (L.)	Not acr	AA V

Taxonomic name	CANOCO name	ECO CODE
Sitophilus granarius (L.)	Sit gra	FG
Tanysphyrus lemnae (Payk.)	Tan lem	AS V
Cidnorhinus quadrimaculatus (L.)	Cid qua	GA V
Ceutorhynchus spp. nse.	Ceutrhy	UU V
Polydrusus spp.	Curtree	TT
Dorytomus tortrix (L.)	Curtree	TT
Anthonomus pomorum (L.)	Curtree	TT
Curculio salicivorus Payk.	Curtree	TT
Phloeophagus lignarius (Marsh.)	Curtree	TT
Acalles misellus Bohe.	Curtree	TT
Rhynchaenus alni (L.)	Curtree	TT
Rhynchaenus quercus (L.)	Curtree	TT
Otiorhynchus ligustici (L.)	Curweed	GA V
Alophus triguttatus (F.)	Curweed	GA V
Rhinoncus pericarpius (L.)	Curweed	GA V
Mecinus pyraster (Hbst.)	Curweed	GA V
Calosirus terminatus (Hbst.)	Curweed	GA V
Gymnetron pascuorum (Gyll.)	Curweed	GA V
Ceutorhynchus erysimi (F.)	Curweed	GA V
Ceutorhynchus pollinarius (Forst.)	Curweed	GA V
Trachyphloeus scabriculus (L.)	Curdry	GX V
Strophosoma faber (Hbst.)	Curdry	GX V
Micrelus ericae (Gyll.)	Curdry	GX V
Cionus scrophulariae (L.)	Curdry	GX V
Curculionidae spp. nse.	Curcid	UU.V

Table 14.4: Feature faunas.
Roman ditch faunas (D) compared with Roman pit faunas (P).
High ditch taxa blue; high pit taxa red. For explanation see text.

	Dyschii	Notiopł	Clivina	Tre que	Tre mic	Bembic	Harpalt	Ophoni	Har ruf	Pterost	Pte me	Pte wet	Calathu	Lae ter	Ago do	Amara	Car we	Car dry	Carabic	Dytstaç	Hydrae	Hydrfin	Hydsta;	Hydrop	Aga lly
D	0.13	0.00	0.08	0.53	0.21	0.78	0.00	0.00	0.09	0.35	0.09	0.00	0.00	0.00	0.00	0.28	0.13	0.00	1.77	0.00	0.99	0.13	0.16	0.39	0.09
P	0.00	0.00	0.00	0.38	0.00	0.42	0.00	0.00	0.00	0.79	0.00	0.00	0.00	0.23	0.00	0.64	0.00	0.18	1.12	0.23	0.00	0.31	0.00	0.00	0.00

	Watflov	Water	Watsta	Heloph	Sphaer	Cercyo	Cer ane	Ce foul	Meg ob	Crypto	Acr nig	Histid	Silpha	Leiodid	Catops	Clambu	Scydmi	Orthop	Ptenidi	Acrotri	Ptiliid	Micropł	Megartl	Lesteva	Phyllod
D	0.08	0.00	0.00	1.98	0.54	1.71	1.50	1.50	1.51	0.13	0.98	0.53	0.00	0.00	0.00	0.00	0.30	0.38	0.79	1.51	0.00	0.00	0.09	0.22	0.00
P	0.00	0.00	0.00	3.16	0.13	0.36	0.62	1.71	1.01	0.14	0.79	0.17	0.14	0.00	0.13	0.26	0.23	0.00	0.42	0.00	0.00	0.00	0.00	0.00	0.14

	Omaliu	Oma ca	Oma ri	Oma al	Xyl con	Xylodrc	Cop str	Car bil	Car ful	Car pus	Carpeli	Ano ruç	Ano sci	Ano nit	Ano coi	Ano tet	Anotylu	Oxytelu	Oxy sci	Pla are	Pla cor	Pla nit	Platyst	Euaesth	Stenus
D	0.64	0.25	0.16	0.00	0.63	0.40	0.00	0.25	0.00	2.81	3.12	0.68	0.74	1.63	0.09	0.63	0.00	0.00	0.88	1.63	1.46	1.77	0.16	0.13	1.34
P	0.76	0.00	0.00	0.00	0.60	0.13	0.00	0.36	0.00	0.37	0.79	1.17	0.23	1.85	0.00	0.47	0.00	0.14	0.14	0.93	0.00	0.00	0.00	0.00	0.36

	Rugilus	Lithoch	Lathrot	Leptaci	Gyr fra	Gyrohy	Xan lin	Xantho	Neobisi	Philont	Phifoul	Cre ma	Staphic	Quediu	Tachyp	Tachini	Dru car	Falagri	Cordali	Cil sil	Aleochi	Aleocin	Euplect	Pselfid	Canth
D	0.33	0.00	0.22	0.25	0.31	0.29	0.25	0.13	0.09	0.91	0.00	0.00	0.92	0.08	0.79	0.16	0.00	1.07	0.18	0.13	0.14	6.50	0.08	0.58	0.00
P	0.00	0.00	0.00	0.00	0.32	0.31	0.14	0.00	0.45	0.50	0.00	0.00	0.78	0.00	0.26	0.47	0.00	0.39	0.33	0.00	0.14	3.90	0.18	0.18	0.00

	Canth	Agriot	Agr mu	Athous	Elatrid	Scirtid	Cyphor	Dryops	Dermes	Kat ruf	Brachy;	Meliget	Omosit	Rhizopl	Rhi par	Monoto	Ory sur	Cry fer	Cryptoj	Atomar	Phalaci	Lat min	Enicmu	Eph glc	Dienere
D	0.00	0.00	0.00	0.00	0.40	0.00	0.13	0.09	0.00	0.13	0.89	0.57	0.40	0.16	0.00	0.90	5.95	2.91	1.80	1.23	0.13	4.00	0.90	0.37	0.00
P	0.00	0.00	0.00	0.00	0.54	0.00	0.00	0.00	0.00	0.27	0.00	0.58	0.13	0.00	0.00	0.28	3.78	3.85	1.92	1.14	0.00	3.10	0.26	0.40	0.60

	Cortica	Cortcin	Typ ste	Agl bru	Myc hir	Coccid	Lyc lin	Ano pu	Tip uni	Pti fur	Ptinus	Anthicu	Blaps	Pal rat	Ten ob:	Tro sca	Geotrul	Onthop	Oxy syl	Aph pro	Aph gra	Aphodii	Phy hoi	Loc sut	Chrtree
D	0.98	1.95	0.13	0.58	0.00	0.00	0.08	2.98	0.58	0.08	0.33	1.76	0.27	0.64	0.40	0.27	0.00	0.23	0.91	1.09	0.82	2.87	0.24	0.14	0.00
P	1.13	0.42	0.42	0.00	0.00	0.00	0.00	4.26	0.55	0.99	0.17	0.95	0.00	0.98	0.00	0.00	0.31	0.00	0.26	0.00	1.03	3.45	0.76	0.14	0.00

	Longita	Haltcin	Chaeto	Cha co	Chrywa	Chrwet	Chrwee	Chrymi	Bru ruf	Bruchu	Lep var	Apion	Apiwee	Sitona	Not acr	Sit gra	Tan len	Cid qua	Ceutrhy	Curtree	Curwee	Curdry	Curcid
D	0.08	0.24	0.13	0.92	0.00	0.00	0.48	0.80	0.00	0.21	0.00	0.62	0.00	0.28	0.18	1.87	0.00	0.00	0.80	0.00	0.16	0.00	2.14
P	0.42	0.00	0.00	0.36	0.00	0.00	0.27	0.00	0.00	0.00	0.00	0.50	0.00	0.14	0.14	0.98	0.00	0.00	0.13	0.00	0.13	0.00	1.02

Appendix 1: Calculation of number of people required to fill Pit 4800 to one year's depth.

From calculations by Kenward and Large (1998, Appendix 2)

Volume of fill

Assuming two pit layers, e.g. 4914 and 4922, make up one year's fill, together they are approximately 0.5m deep, while the pit is 2m x 2m.

Therefore the total volume of one year's fill is 2000 litres.

Fill contents

This pit contained soil and, presumably, some material used for anal wipes, in addition to cess. The soil, from the analysis of the residue after paraffin flotation, was about one third of the total volume. The faeces produced by each person would occupy about 110 litre/year. An assumption has been made that material used for anal wipes (i.e. hay or moss) would pack down to about half that size. This ingredient was omitted from the calculations by Kenward and Large (1998).

Calculation

Volume of pit = 2000l

Added soil = 667l

Volume of faeces from 1 person / year = 110l

Plus volume of material for anal wipes = 55l

Therefore no. needed to fill pit / year = (Volume of pit - volume of added soil)/
(Volume of faeces + Volume of anal wipes)

= (2000l-667l)/(110l+55l)

= 8

Conclusion

About eight people would be needed to fill the pit to the required depth. This is a reasonable hypothetical number.

BIBLIOGRAPHY

Addyman, P. V. (1989) The Archaeology of Public Health at York, England. *World Archaeology*, **21**, 244-264

Addyman, P. V., Hood, J. S. R., Kenward, H. K., MacGregor, A. and Williams, D. (1976) Palaeoclimate In Urban Environmental Archaeology at York, England: Problems and Potential. *World Archaeology*, **8**, 220-233

Aitken, A. D. (1975) *Insect Travellers*, Technical Bulletin **31**, Vol.**1**, Coleoptera, Her Majesty's Stationary .Office

Alexander, K. N. A. (1994) *An Annotated Checklist of British Lignicolous and Saproxylic Invertebrates*. National Trust Estates Advisors' Office, Cirencester

Allen, A. A. (1936) *Adelocera querca* Herbst (Col. Elateridae) Established as British. *Entomologists Monthly Magazine* **72**, 267-269

Allen, A. A. (1951-64) The Coleoptera of a Suburban Garden. *Entomologist's Record* **63**, 61-64; 187-190; 256-259; **64**, 61-63; **65**, 225-231; **68**, 215-222; **71**, 16-20; 39-44; **76**, 237-342, 261-264

Allen, A. A. (1951b) *Lathridius bifasciatus* Reitter (Coleoptera Lathridiidae) an Australian beetle found wild in Britain. *Entomologists Monthly Magazine*, **87** 114-115

Allison, E. P. and Kenward, H. K. (1987) Insect Remains from Copthall Avenue, London. *Ancient Monuments Laboratory Report*, **194/87** London

Allison, E. P. and Kenward, H. K. (1994) IV. Insects. In B. S. Ayers, Excavations at Fishergate, Norwich 1985. *East Anglian Archaeology*, **68**, 45-48

Allison, E. P., Hall, A. R., Kenward, H. K., McKenna, B., Nicholson, C. M. and O'Connor, T. P. (1996) *Environmental Evidence. In M. Foreman, Further Excavations at The Dominican Priory, Beverley, 1986-89*, 195-212. Sheffield Excavation Reports **4**, Sheffield

Alvey, R. C. (1976) A Roman Well at Bunny, Nottinghamshire. *Transactions of the Thoroton Society of Nottinghamshire*, **71**, 8

Amorosi, T., Buckland, P. C., Magnússon, K., McGovern, T. H. and Sadler, J. P. (1994) An Archaeozoological Investigation of The Midden at Nesstofa, Reykjavík, Iceland. In R. Luff and P. Rowley-Conwy (eds.) *Whither Environmental Archaeology*, 69-80. Oxbow Monograph **38**, Oxford

Amsden, A. F., and Boon, G. C. (1975) C. O. Waterhouse's List of Insects From Silchester (With A Note On Early Identifications of Insects In Archaeological Contexts). *Journal of Archaeological Science*, **2**, 129-136

Andrews, P. (1997) *Excavations at Hamwic* Vol **2** Council for British Archaeology Research Report **109**

Angus, R. B. (1979) Review of Kenward, 1978. *Journal of Animal Ecology*, **48**, 331

Arnquist, G. and Wooster, D. (1995) Meta-analysis: Synthesizing Research Findings in Ecology and Evolution. *Tree*, Vol. **10** No. **6**, 236-240

Ashworth, A. C. (1976) Fossil Insects from the Sonoran Desert, Arizona. *American Quaternary Association, 1976 Meeting, Abstracts*, **4**, 122

Askevold, I. S. (1990) Classification of Tertiary fossil Donaciinae of North America and their Implications about Evolution of Donaciinae (Coleoptera: Chrysomelidae). *Canadian Journal of Zoology*

Atkinson, T. C., Briffa, K. R., Coope, G. R., Joachim, J. M. and Perry, D. W. (1986) Climatic Calibration of Coleopteran Data. In B. E. Berglund (ed.) *Handbook of Holocene Palaeoecology and Palaeohydrology*, 851-858, J. Wiley and Son, Chichester

Atkinson, T. C., Briffa, K. R. and Coope, G. R. (1987) Seasonal Temperatures in Britain during the past 22,000 years, reconstructed using beetle remains. *Nature* (London), **325**, 587-592

Atkinson, T. C., Briffa, K. R. and Coope, G. R. (1993) The Thermal Climate in Lateglacial Britain. *Quaternary Newsletter*, **69**, 97

Austin, T. (1888) *Two 15th century cookery books.* The Early English Text Society, London: Oxford University Press (1964)

Beavis, I. C. (1988) *Insects and Other Invertebrates in Classical Antiquity.* University of Exeter

Bennett, F.C., Codrington, R.H. and Deedes, C. (eds) (1904) *Statutes and Constitutions of the Cathedral Church of Chichester and the Sherburn Statutes of the Vicars Choral*

Bentley, Gunn, D. L. and Ewer (1941) The Biology of *Ptinus tectus* (Ptinidae Coleoptera) Journal Experimental. Biology, **18**, 182-95

Beveridge, W. H. (1939) *Prices and Wages in England from the 12th to the 19th century*, London

Biddle, M. (1975) Excavations at Winchester, 1971, Tenth and Final Interim Report, *Antiquaries Journal* **55**, Part 2, 295-337

Biddle, M. (1990) *Object and Economy in Medieval Winchester Winchester Studies* **7ii**, Oxford

Birch, L. C. (1945) *A Contribution to the Ecology of Calandra oryzae and Rhyzopertha dominica in Stored Wheat*, Waite Agriculture Research Institute, University of Adelaide

Blake, E. G. (1925) *Enemies of Timber*, Chapman and Hall, London

Blakeney, R. (1984) *Fishbourne A Village History*, Chichester

Bradley, P. L. (1958) An Assemblage of Arthropod Remains From a Roman Occupation Site at St. Albans. *Nature* (London), **181**, 435-436

Brandon P. and Short, B., (1990) *The South East from AD 1000 A Regional History of England*, British Archaeological Research Reports

Braudel, F, (1981) *Civilization and Capitalism 15th-18th Century, Vol 1, The Structures of Everyday Life*, London

Brendell, M .J. D. (1975) Coleoptera Tenebrionidae, *Handbook for the Identification of British Insects*, V. **10**, Royal Entomological Society of London

Brouwer, A. (1967) *General Palaeontology.* Edinburgh and London

Brown, A. P. and Robinson, M. A. (1985) A Summary of Plant and Insect Remains From The Post-Medieval Pits at Church Street (Site A). In T. G. Hassall, C. E. Halpin and M. Mellor, Excavations In St. Ebbe's, Oxford, 1967-1976 : Part II: Post-Medieval Domestic Tenements and The Post-Dissolution Site of The Greyfriars, *Oxoniensia,* **49**, 268 + Fiche VI, F3

Büchner, S. and Wolf, G. (1997) Der Kornkäfer – *Sitophilus granarius* (Linné) – Aus Einer Bandkeramischen Grube Bei Göttingen. *Archäologisches Korrespondenzblatt*, **27**, 211-220

Buck, F. D. (1948) *Pentarthrum huttoni* (Col., Curculionidae) and some Imported Cossoninae, *Entomologists Monthly Magazine*, **84,** 133-5

Buckland, P. C. (1974) Archaeology and Environment in York. *Journal of Archaeological Science*, **1**, 303-316

Buckland, P. C. (1976a) *The Environmental Evidence From The Church Street Roman Sewer System. Archaeology of York,* **14/1**, Council For British Archaeology For York Archaeological Trust.

Buckland, P. C. (1976b) The use of insect remains in the interpretation of archaeological environments. In D. A. Davidson & M. L. Shackley (eds.) *Geoarchaeology: Earth sciences and the past*, 360-396. Duckworth, London

Buckland, P. C. (1979a) Review of Kenward, (1978) *Yorkshire Archaeological Journal*, **51**, 170

Buckland, P. C. (1979b) *Thorne Moors : A Palaeoecological Study of A Bronze Age Site* (A Contribution to The History of the British Insect Fauna). University of Birmingham, Department of Geography Occasional Publication **8**, Birmingham

Buckland, P. C. (1980) Insect Remains from the Well. In I. M. Stead, *Rudston Roman Villa*, 162-167. Yorkshire Archaeological Society, Leeds

Buckland, P. C. (1981a) Insect Remains From Beneath The Brigg 'Raft', in S. McGrail (ed.) *The Brigg 'Raft' and Her Prehistoric Environment.* 155-175, British Archaeological Reports, **89**. Oxford

Buckland, P. C. (1981b) The Early Dispersal of Insect Pests of Stored Products as Indicated By Archaeological Records. *Journal of Stored Product Research*, **17**, 1-12

Buckland, P. C. (1986) An Insect Fauna From A Roman Well at Empingham, Rutland. *Transactions of the Leicestershire Archaeological and Historical Society*, **60**, 1-6

Buckland, P. C. (1990) Granaries, Stores and Insects. The Archaeology of Insect Synanthropy. In D. Fournier and F. Sigaut (eds.) *La Préparation Alimentaire Des Céréales, 69-81. Rapports Présentés À La Table Ronde*, Ravello Au Centre Universitaire Pour Les Biens Culturels, Avril 1988. Pact, Rixensart, Belgium

Buckland, P. C. (1995) A Beetle Fauna from the Organic Deposit F23 In The Stone-Lined Pit (F22). In F. McCormick, Excavation at Pluscarden Priory, Moray, *Proceedings of the Society of Antiquaries of Scotland*, **124**, 417-418

Buckland, P. C. (1996) Insects. In J. May, *Dragonby, Report on Excavations at an Iron Age and Romano-British Settlement In North Lincolnshire*, 165-170. Oxbow Monograph **61**, Oxford

Buckland, P. C. (1997) Review of Kenward and Hall 1995, *Journal of Archaeological Science*, **24**, 962-963

Buckland, P. C., Ashworth, A. C. and Schwert, D. (1995) By-Passing Ellis Island. Insect Immigration to North America, in R. Butlin and N. Roberts (eds.) *Ecological Relations in Historical Times*, 226-244. Institute of British Geographers, Blackwell, Oxford

Buckland, P. C. and Coope, G. R. (1991) *A Bibliography and Literature Review of Quaternary Entomology*, J. Collis Publications, University of Sheffield

Buckland, P. C., Dugmore, A. J. and Sadler, J. (1991) Faunal Change or Taphonomic Problem? A Comparison of Modern and Fossil Insect Faunas From South East Iceland. In J. K. Maizels and C. Caseldine (eds.) *Environmental Change in Iceland: Past and Present*, 127-146. Kluwer Academic Publishers, Dordrecht

Buckland, P. C., Greig, J. R. A. and Kenward, H. K. (1974) York: An Early Medieval Site. *Antiquity*, **48**, 25-33

Buckland, P. C., Holdsworth, P. and Monk, M. (1976) The Interpretation of a Group of Saxon Pits in Southampton. *Journal of Archaeological Science*, **3**, 61-69

Buckland, P. C, Magilton, J. R. and Hayfield, C., (1989) *The Archaeology of Doncaster 2 The Medieval and Later Town* British Archaeological Reports, British Series **202**, 1

Buckland, P. C., Sadler, J. P. and Smith, D. (1993) An Insect's Eye-View of The Norse Farm. In C. E. Batey, J. Jesch and C. D. Morris (eds.) *The Viking Age In Caithness, Orkney and The North Atlantic*, 518-528. Edinburgh University Press

Buckland, P.C., Sadler, J. P. and Sveinbjarnardóttir, G. (1992) Palaeoecological Investigations at Reykholt, Western Iceland. In, C. J. Morris and D. J. Rackman (eds.) *Norse and Later Settlement and Subsistence In The North Atlantic* , 149-168. Dept. of Archaeology, University of Glasgow

Buckland, P. C., Sveinbjarnardóttir, G., Savory, D., McGovern, T. H., Skidmore, P. and Andreasen, C. (1983) Norsemen at Nipáitsoq, Greenland: A Palaeoecological Investigation. *Norwegian Archaeological Review*, **16**, 86-98

Buckland, P. I., Yuan Zhuo, D. and Buckland, P. C. (1997) Towards An Expert System In Palaeoentomology. In A. C. Ashworth, P. C. Buckland and J. P. Sadler (eds.) *Studies In Quaternary Entomology – An Inordinate Fondness For Insects*. Quaternary Proceedings **5**, 67-78

Bullock, J. A. (1993) *Host Plants of British Beetles: A List of Recorded Associations* The Amateur Entomologists' Society

Carrott, J., Hall, A., Issitt, M., Kenward, H and Large, F. (1996) *Medieval Plant and Invertebrate Remains Principally Preserved by Waterlogging at the Brooks, Winchester, Hampshire* (Site code: BRI and BRII): Technical Report, Reports from the Environmental Archaeology Unit, York **96/20**

Carrott, J., Hall, A., Issitt, M., Kenward, H., Large, F. and McKenna, B. (1995a) *Plant and Invertebrate Remains From Excavations at Dowbridge Close, Kirkham, Lancashire* (Site Code Kd94. Reports From The Environmental Archaeology Unit, York, **95/2**

Carrott, J., Irving, B., Issitt, M., Jacques, D., Kenward, H., Large, F., McKenna, B. and Milles, A. (1995b) The Biological Remains. In, K. Steedman and M. Foreman, *Excavations at Aylesby, South Humberside, 1994*. Lincolnshire History and Archaeology, **30**, 32-34

Carrott, J., Issitt, M., Kenward, H., Large, F. and McKenna , B. and Skidmore, P. (1995c) *Insect and Other Invertebrate Remains from Excavations at Four Sites in Lincoln* (Site Codes Wn87, Wnw88, Wf89 and Wo89. Reports from the Environmental Archaeology Unit, York, **95/10**

Clarke, G. M. (1994) *Statistics and Experimental Design an Introduction For Biologists and Biochemists*. Arnold, London

Coacker, T. H. and Williams, D. A. (1963) The Importance of some Carabids and Staphylinids as Predators of the Cabbage Root Fly (*Erioistha brassicae*). *Entomologia experimentia et applica*, **6**, 156-164.

Colledge, S. M. (Not dated but 1981 Environmental Report. In R. McNeil-Sale *et al.*, *Archaeology in Nantwich: Crown Car Park Excavations*, *Interim Report*, **36**. Bemrose Press, Chester

Colledge, S. M. and Osborne, P. J. (1980) Plant and Insect Remains. In M. Carver, The Excavation of Three Medieval Craftsmen's Tenements in Sidbury, Worcester. *Transactions of The Worcestershire Archaeological Society*, **7**, 207-210

Cong, S. and Ashworth, A. C. (1997) The Use of Correspondence Analysis in the Analysis of Fossil Beetle Assemblages. In A. C. Ashworth, P. C. Buckland and J. P. Sadler (eds.) *Studies In Quaternary Entomology – An Inordinate Fondness For Insects.* Quaternary Proceedings **5**, 79-82

Coombes, C .W. and Freeman, J. A. (1955) The Insect Fauna of an Empty Granary, *Bulletin of Entomological Research*, **46** 399-416

Coope, G. R. (1959) A Late Pleistocene Insect Fauna from Chelford, Cheshire. *Proceedings of the Royal Society of London*, **B151**, 70-86

Coope, G. R. (1965) *Fossil Insect Faunas From Late Quaternary Deposits in Britain.* Advancement of Science, March 1965, 564-575

Coope, G. R. (1970) Interpretations of Quaternary Insect Fossils. *Annual Review of Entomology*, **15**, 97-120

Coope, G. R. (1973) Tibetan Species of Dung Beetle from Late Pleistocene Deposits in England. *Nature* (London) **245**, 335-336

Coope, G. R. (1977) Quaternary Coleoptera as Aids in the Interpretation of Environmental History. In F. W. Shotton (ed.) *British Quaternary Studies*, 55-68. Oxford University Press

Coope, G. R. (1978) Constancy of Insect Species Versus Inconstancy of Quaternary Environments. In L. A. Mound and N. Waloff (eds.) Diversity of Insect Faunas, 176-187. *Symposia of The Royal Entomological Society of London*, 9 Blackwell, Oxford

Coope, G. R. (1979) Coleoptera analysis. In B. E. Berglund (ed.) *Palaeohydrological Changes in the Temperate Zone in the last 15,000 Years*, **BII**. *Specific Methods*, 315-328

Coope, G. R. (1981) Report on the Coleoptera from an Eleventh-Century House at Christ Church Place, Dublin. In H. Bekker-Nielsen, P. Foote and O. Olsen (eds.) *Proceedings of The Eighth Viking Congress 1977*, 51-56. Odense University Press

Coope, G. R. (1987) The Response of Late Quaternary Insect Communities to Sudden Climatic Changes. In J. H. R. Gee and P. S. Giller (eds.), *Organisation of Communities – Past and Present*, 421-438. Blackwell Scientific Publications, Oxford

Coope, G. R. (1995) The Effects of Quaternary Climatic Changes on Insect Populations: Lessons from the Past. In R. Harrington and N. E. Stork (eds.) *Insects In a Changing Environment*, 29-48. Academic Press, London

Coope, G. R. and Osborne, P. J. (1968) Report on the Coleopterous Fauna of the Roman Well at Barnsley Park, Gloucestershire. *Transactions of the Bristol and Gloucestershire Archaeological Society*, **86**, 84-87

Coope, G. R., Shotton, F. W. and Strachan, I. (1961) A Late Pleistocene Fauna and Flora from Upton Warren, Worcestershire. *Philosophical Transactions of the Royal Society of London*, **B244**, 379-421

Cooter, J. (1991) *A Coleopterist's Handbook*, The Amateur Entomologists' Society

Cox, M. L. and Campbell J. M. (1998) Increased Abundance and Spread of *Aphthona euphorbiae* (Schrank) and *Longitarsus parvulus* (Payk.) Chrysomelidae in Oxfordshire, *Coleopterist*, **7**, 11-14

Crowson, R. A. (1981) *The Biology of the Coleoptera*, Academic Press, London

Cunliffe, B. W., Down, A. G., Rudkin, D. J. (1996) *Chichester Excavations IX Excavations at Fishbourne 1969-1988* Chichester District Council

Cymorek, S. and Koch, K. (1969) Über Funde Von Körperteilen Des Messingkäfers *Niptus Hololeucus* (Fald.) In Ablagerungen Aus Dem 15.-16. Jahrhundert (Neuss, Neiderrhein) Und Folgerungen Daraus Für Die Ausbreitungsgeschichte Der Art In Europa. *Anzeiger Für Schädlingskunde Und Pflanzenschutz*, **42**, 185-186

Dale, M.K. and Redstone, V.B. (eds), (1931) *The Household Book of Dame Alice de Bryene of Acton Hall, Suffolk Sept. 1412-Sept. 1413*

Davis, B. N. K. (1973) The Hemiptera and Coleoptera of the Stinging Nettle (*Urtica dioica*) in East Anglia. *Journal of Animal Ecology* **10**, 213-246

Davis, B. N. K. (1982) Urbanisation and the Diversity of Insects in L. A. Mound and N. Waloff Diversity of Insect Faunas, *Symposia of Royal Entomological Society of London*, **9**, Oxford

Dieckmann, L. (1972) Beiträge zur Insektenfauna der DDR: Coleoptera-Curculioniidae Ceutorhynchinae *Beiträge zur Entomologie*, **22**, 1-128

Dinnin, M. H. (1992) *Islands Within Islands: The Development of The British Entomofauna During The Holocene and the Implications for Conservation.* Unpubl. Ph.D., University of Sheffield

Dinnin, M. H. (1997) Holocene Beetle Assemblages From The Lower Trent Floodplain at Bole Ings, Nottinghamshire, U.K. In A. C. Ashworth, P. C. Buckland and J. P. Sadler (eds.) *Studies In Quaternary Entomology – An Inordinate Fondness For Insects.* Quaternary Proceedings **5**, 83-104

Dinnin, M. H. and Sadler, J. P. (1999) 10,000 Years of Change: the Holocene Entomofauna of the British Isles. In, K. J. Edwards and J. P. Sadler (eds.) *Holocene Environments of Prehistoric Britain. Quaternary Proceedings* 7, 545-562

Donisthorpe, H. St. J. K. (1939) *A Preliminary List of the Coleoptera of Windsor Forest,* Lloyd and Co. London

Drewett, P., Rudlin, D. and Gardiner, M. (1988) *The South East to AD 1000 A Regional History of England*, Longman, London

Elias, S. A. (1992) Late Quaternary Zoogeography of the Chihauhuan Desert Insect Fauna, Based on Fossil Records from Packrat Middens. *Journal of Biogeography*, **19**, 285-297

Elias, S. A. (1994) *Quaternary Insects and Their Environments.* Smithsonian Institution Press, Washington

Elton, C. S. (1958) *The Ecology of Invasions by Plants and Animals*, Methuen, London

Ervynck, A., Desender, K., Pieters, M. and Bungeneers, J. (1994) Carabid Beetles as Palaeo-Ecological Indicators in Archaeology. In K. Desender, M. Dufrêne, M. Loreau, M. L. Luff and J.-P. Maelfait (eds.) *Carabid Beetles: Ecology and Evolution*, 261-266. Kluwer Academic Publication., Dordrecht

Everitt, B. S. (1980) *Cluster Analysis, an SSRC Review of Current Research.* Heinemann London

Fager, E. W. (1957) Determination and Analysis of Recurrent Groups *Ecology* **38**, 4, 586-593

Fager, E. W. (1968) The Community of Invertebrates in Decaying Oak Wood. *Journal of Animal Ecology*, **37**, 121-142

Fisher, R. A., Corbet, A. S. and Williams, C. B. (1943) The Relationship Between the Number of Species and the Number of Individuals in a Random Sample of an Animal Population. *Journal of Animal Ecology* **12**, 42-58

Foster, B. (1963) *The Local Port Book of Southampton 1435-6*, Southampton Record Series, Southampton

Friday, L. E. (1988) *A key to the Adults of British Water Beetles*, Field Studies 7, 1-151

Garvin, J. W. (1986) *Skills in Advanced Biology, Vol. 1 Dealing with Data*, Stanley Thomas Ltd. Cheltenham

Gauch, H. G. (1984) *Multivariate Analysis in Community Ecology.* Cambridge University Press.

Giorgi, J. and Robinson, M. (1985) The Environment. In M. Foreman and S. Rahtz, Excavations at Faccenda Chicken Farm, Near Alchester, 1983. *Oxoniensia,* **49**, 38-45

Girling, M. A. (1979) The Insects. *In Southwark Excavations 1972-1974*, 170-172; 414 and 466. Joint Publication **1**, London and Middlesex Archaeological Society and Surrey Archaeological Society, London

Girling, M. A. (1981a) Beetle Remains. In J. C. Thorn, The Burial of John Dygon, Abbot of St. Augustine's. In A. Detsicas (ed.) *Collectanea Historica: Essays In Memory of Stuart Rigold*, 82-84. Kent Archaeological Society, Maidstone

Girling, M. A. (1981b) The Environmental Evidence. In J. E. Mellor and T. Pearce, *The Austin Friars, Leicester*, 169-173. Council for British Archaeology, Research Report **35**, London

Girling, M. A. (1982) *The Arthropod Assemblage From Cutler's Gardens.* Ancient Monuments Laboratory Report **3670**, 1-16. London

Girling, M. A. (1983) The Environmental Implications of The Excavations of 1974-76. In A. E. Brown, C. Woodfield and D. C. Mynard, Excavations at Towcester, Northamptonshire The Alchester Road Suburb. *Northamptonshire Archaeology*, **18**, 128-130 + Fiche

Girling, M. A. (1984a) A Little Ice Age Extinction of a Water Beetle from Britain *Boreas*, **13**, 1-4

Girling, M. A. (1984b) Investigations of a Second Insect Assemblage from the Sweet Track. *Somerset Levels Papers*, **10**, 79-91

Girling, M. A. (1985) The Insect Fauna – City Arms, Trench 6, Layer 3. In R. Shoesmith, *Hereford City Excavations. 3, The Finds*, 96 + Fiche M9.B12-14. Council for British Archaeology Research Report **56.** London

Girling, M. A. (1989) The Insect Fauna of the Roman Well at the Cattlemarket. In A. Down, *Chichester Excavations*, **6**, 234-241. Philimore, Chichester

Girling, M. A. (1991) Fossil Insect Faunas From Buckbean Pond, Breiddin Hillfort. In C Musson, *The Breiddin Hillfort: A Later Prehistoric Settlement In The Welsh Marches*, Fiche 2, 153-169. Council for British Archaeology Research Report **76**, London

Girling, M. A. and Kenward, H. K. (1986) *Arthropod Remains From Archaeological Sites In Southampton.* Ancient Monuments Laboratory Report **46/86**. London

Girling, M. A. and Robinson, M. A. (1989) Ecological Interpretations from The Beetle Fauna. In, Environmental Samples, In C. Hayfield and J. Greig (eds.) Excavation and Salvage Work on a Moated Site at Cowick, South Humberside, 1976. *Yorkshire Archaeological Journal*, **61**, 47-70

Girouard, M. (1985) *Cities and People* London

Good, J. A. and Giller, P. S. (1991) The Diet of Predatory Staphylinid Beetles – a Review of Records, *Entomologists Monthly Magazine* **127**, 77-89

Gray, E (1996) *The British House*, Barrie and Jenkins, London.

Green, F. L. (1979) *Medieval Plant Remains: Methods and Results of Archaeobotanic Analysis from Excavations in Southern England with Especial Reference to Winchester and Urban Settlements of the 10th-15th Centuries.* Unpubl. M.Phil. Thesis Southampton

Green, F. J. (1983) The Archaeological and Documentary Evidence for Plants from the Medieval Period in England, in W. van Zeist and W. A. Casparie (eds) *Plants and Ancient Man – studies in Palaeoethnobotany*, Groningen

Green F. J. (1994) *Cereals and Plant Food: A Reassessment of the Saxon Economy, Evidence from Wessex in Environment and Economy in Anglo-Saxon England*, Council for British Archaeology, **89**

Greenacre, M .J. (1984) *Theory and Application of Correspondence analysis*, Academic Press London

Greig, J. R. A. (1982) Garderobes, Sewers, Cesspits and Latrines. *Current Archaeology*, **85**, 49-52

Greig, J. R .A. (1988) Plant Resources in G. Astill and A. Grant (eds) *The Countryside of Medieval England*, Blackwell

Greig, J. R. A., Girling, M. A. and Skidmore, P. (1982) The Plant and Insect Remains. In P. Barker and R. Higham (eds.) Hen Domen, Montgomery. *A Timber Castle On The English-Welsh Border*, 60-71. Royal Archaeological Institute, London

Grove, J. M. (1988) *The Little Ice Age*, London

Hall, A. R. and Kenward, H. K. (1980) An Interpretation of Biological Remains From Highgate, Beverley. *Journal of Archaeological Science* **7**, 33-51

Hall, A. R. and Kenward, H. K. (1990) *Environmental Evidence from The Colonia. Archaeology of York*, **14/6**. Council for British Archaeology for York Archaeological Trust

Hall, A. R., Jones, A. K. G. and Kenward, H. (1983a) Cereal Bran and Human Faecal Remains From Archaeological Deposits – Some Preliminary Observations. In B. Proudfoot (ed.) *Site, Environment and Economy*, 85-104. British Archaeological Reports **S173**. Oxford

Hall, A. R., Kenward, H. K. and Large, F. (1996) *Biological Remains From A Medieval 'Pond' at Higher Lane, Fazekerley, Merseyside* (Site Code Faz94). Reports From The Environmental Archaeology Unit, York, **94/15**

Hall, A. R., Kenward, H. K. and Robertson, A. (1993a) *Investigation of Medieval and Post-Medieval Plant and Invertebrate Remains From Area II of The Excavations In The Bedern (North-East), York* (YAT/Yorkshire Museum Sitecode, 1973-81,14 II). Ancient Monuments Laboratory Report **58/93**. London

Hall, A. R., Kenward, H. K. and Robertson, A. (1993b) *Investigation of Medieval and Post-Medieval Plant and Invertebrate Remains From Area IV The Excavations in The Bedern (North-East), York* (YAT/Yorkshire Museum Sitecode, 1976-81,14 IV). Ancient Monuments Laboratory Report **57/93**. London

Hall, A. R., Kenward, H. K. and Robertson, A. (1993c) *Investigation of Medieval and Post-Medieval Plant and Invertebrate Remains From Area X of The Excavations In The Bedern (South-West), York* (YAT/Yorkshire Museum Sitecode 1973-81.13 X). Ancient Monuments Laboratory Report **56/93**. London

Hall, A. R., Kenward, H. K. and Williams, D. (1980) *Environmental Evidence from Roman Deposits in Skeldergate. Archaeology of York,* **14/3**. Council for British Archaeology For York Archaeological Trust

Hall, A. R., Kenward, H. K., Williams, D. and Greig, J. R. A. (1983b) *Environment and Living Conditions at Two Anglo-Scandinavian Sites. Archaeology of York,* **14/4.** Council for British Archaeology for York Archaeological Trust

Halstead, D. G. H. (1963) Coleoptera *Histeridae Handbooks for the Identification of British Insects*, **IX** 10 Royal Entomological Society of London

Halstead, D. G. H. (1993) Keys for the Identification of Beetles Associated with Stored Products II Laemophloeidae, Passandridae and Silvanidae *Journal of Stored Product Research* **29**, 99-197

Hammond, P. M. (1971) Notes on British Staphylinidae 2 – on the British Species of *Platystethus* Mannerheim, with One Species New to Britain, *Entomologists Monthly Magazine* **107**, 93-111

Hammond, P. M. (1974) Changes in The British Coleopterous Fauna. in D. L. Hawksworth (ed.) *The Changing Flora and Fauna of Britain*, 323- 369. Systematics Association Special Volume **6**. Academic Press, London

Hammond,P. W. (1993) *Food and Feast in Medieval England,* London

Hannah, I .C. (1914) The Vicars' Close and Adjacent Buildings, Chichester, *Sussex Archaeological Collections*, **56**, 92-109

Hansen, M., (1987) The Hydrophiliodea (Coleoptera) of Fennoscandia and Denmark. *Fauna Entomologica Scandinavica.* **18** Scandinavian Science Press. Leiden

Hanski, I. and Cambefort, Y. (eds) (1991) *Dung Beetle Ecology.* Princeton University Press

Harde, K. W. (1966) Cerambycidae in H. Freude, K. E. Harde and G. A. Lohse (eds) *Die Käfer Mitteleuropas* **9**, 7-94

Harde, K. W. (1984) *A Field Guide in Colour to Beetles,* Octopus, London

Henderson, J. L. (1945) The Beetles of a Suburban London Garden in Surrey, *Entomologists Monthly Magazine*, **81**, 63-65

Henderson, J. .L. (1946) More Beetles of a Suburban London Garden in Surrey, *Entomologists Monthly Magazine*, **82,** 38

Hickin, N. E. (1963) *The Dry Rot Problem*, 2nd edition (1972), Hutchinson, London

Hickin, N .E. (1964) *Household Insect Pests*, Hutchinson, London

Hill, M. O. (1979) *DECORANA- a fortran program for detrended correspondence analysis and reciprocal averaging and TWINSPAN – a fortran program for arranging multivariate data in an ordered two-way table by classification of the individuals and attributes* Cornell University Ithaca New York

Hinton, H. E. (1945) *A Monograph of the Beetles Associated with Stored Products* **1** British Museum (Natural History) London

Hodge, P. J., and Jones, R. A., (1995) *New British Beetles. Species not in Joy's Practical Handbook.* British Entomological Society & Natural History Society, Reading

Horion, A. (1941-67) *Faunistik der Mitteleoropäischen Käfer*, **6**

Howe, R. W. (1955) Studies on Beetles of the Family Ptinidae 12 – The biology of *Tipnus unicolor* Pill. and Mitt. *Entomologists Monthly Magazine*, **91** 119-141

Howe, R. W. (1965) *Sitophilus granarius* (L.) (Col. Curculionidae) Breeding in Acorns, in *Journal of Stored Product Research*, **1**, 99-100

Howe, R. W. and Lektovitch, L. P. (1957) Studies on the Distribution of *Cryptolestes* Species *Bulletin of Entomological Research*, **48**, 795-809,

Hunter, F. A., Tulloch, J. B. M. and Lambourne, M .G. (1973) Insects and Mites of Maltings in the East Midlands of England. *Journal of Stored Product Research*, **9**, 119-141

Hyman, P. S. (1992) *A Review of the Scarce and Threatened Coleoptera of Great Britain Part 1* Joint Nature Conservation Committee, Peterborough

Hyman, P. S. (1994) *A Review of the Scarce and Threatened Coleoptera of Great Britain Part 2* Joint Nature Conservation Committee, Peterborough

Imms, A. D. (1947) *Insect Natural History,* Collins, London

Jessop, L (1986) Coleoptera Scarabaeidae *Handbooks for the Identification of British Beetles* **5**, II Royal Entomological Society of London

Johnson, C. (1993) *Provisional Atlas of the Cryptophaginae, Atomariinae Coleoptera of Britain and Ireland* ed. for Biological Records Centre by P. T. Harding and J. C. M. Dring Biological Records Centre, Huntingdon

Jones, A. K. G. (1976) The Insect Remains. In A. Rogerson, *Excavations on Fuller's Hill, Great Yarmouth*. East Anglian Archaeology **2**, 225

Jones, A. K. G. (1982) Human Parasite Remains: Prospects for a Quantitative Approach in A. R. Hall & H. K. Kenward (eds.) *Environmental Archaeology in the Urban Context*. 71-78, Council for British Archaeology Research Report **43**. London

Jones, A., Tomlinson, T., Hall, A., Kenward, H and Phipps, J. (1991) Environmental Evidence from the Latrine Pit (F5300) in G. D. Scobie, J. M Zant. and R. Whinney *The Brooks, Winchester* Winchester Museums Service

Jones, F. G. W. and Jones, M. G. (1974) *Pests of Field Crops*, Edward Arnold, London

Jones, R. A. (1993) Sycamore an Underrated Pabulum for Insects and Some Beetles Associated with It. *Entomologists Record and Journal of Variation*, 1-11

Joy, N. H. (1932) *A Practical Handbook of British Beetles*, Vols. **I** and **II**

Jurion, J. (1890) *English Sanitary Institutions* repub. 170 E. P.

Kauffman, R. R. U. (1948) Notes on the Distribution of the British Longhorn Coleoptera, *Entomologists Monthly Magazine* **84**, 66-85

Kaye, J. M. (1976) *God's House Cartulary*, Hampshire Record Series 17

Keene, D. J. (1981) Rubbish in Medieval towns. In R. A. Hall and H. K. Kenwards' *Environmental Archeaology in the Urban Context.* Council For British Archaeological Research Report **43** London

Keene, D. J. (1985) *Survey of Medieval Winchester, Winchester Studies* **2**, Oxford

Keepax, C. A., Girling, M. A., Jones, R. T., Arthur, J. R. B., Paradine, P. J. and Keeley, H. (1979) The Environmental Analysis. In J. Williams, *St. Peter's Square, Northampton, Excavations, 1973-1976*, 337. Northampton Development Corporation

Kenward, H. K. (1974) Methods for palaeoentomology on site and in the laboratory. *Science and Archaeology*, **13**, 16-24

Kenward, H. K. (1975a) Pitfalls in the Environmental Interpretation of Insect Death Assemblages. *Journal of Archaeological Science*, **2**, 85- 94

Kenward, H. K. (1975b) The Biological and Archaeological Implications of The Beetle *Aglenus brunneus* (Gyllenhall) In Ancient Faunas. *Journal of Archaeological Science*, **2,** 63-69

Kenward, H. K. (1976a) Further Archaeological Records of *Aglenus brunneus* (Gyll.) In Britain and Ireland, Including Confirmation of Its Presence in the Roman Period. *Journal of Archaeological Science*, **3**, 275-277

Kenward, H. K. (1976b) Reconstructing Ancient Ecological Conditions from Insects Remains: some Problems and an Experimental Approach. *Ecological Entomology*, **1**, 7-17

Kenward, H. K. (1977) A Note On The Insect Remains From Column Sample IV. In P. Armstrong, *Excavations In Sewer Lane, Hull, 1974*. East Riding Archaeologist, **3**, 31-32

Kenward, H. K. (1978a) *The Analysis of Archaeological Insect Assemblages: A New Approach. Archaeology of York,* **19/1**. Council for British Archaeology For York Archaeological Trust

Kenward, H. K. (1978b) The value of Insect Remains as Evidence of Ecological Conditions on Archaeological Sites. In D. R. Brothwell, K. D. Thomas & J. Clutton-Brock (eds.) *Research Problems in Zooarchaeology*, 25-38. Institute of Archaeology, University of London, Occasional Publication **3**

Kenward, H. K. (1979a) Five Insect Assemblages. In M. O. H. Carver, Three Saxo-Norman Tenements In Durham City. *Medieval Archaeology*, **23.** 60- 67

Kenward, H. K. (1979b) Insect Remains as Indicators of Archaeological Environments. In A. Aspinal and S. E. Warren (eds.) *University of Bradford Symposium On Archaeological Sciences 4-7th January (1978 Invited Papers and Abstracts*, 94-95. Bradford

Kenward, H. K. (1979c) The Insect Death Assemblages. In B. S. Ayres, *Excavations at Chapel Lane Staithe, 1978. Hull Old Town Reports Series 3.* East Riding Archaeologist, **5**, 65-72

Kenward, H. K. (1982) Insect Communities and Death Assemblages, Past and Present. In A. R. Hall and H. K. Kenward (eds.) *Environmental Archaeology in The Urban Context.* 71-78. Council For British Archaeology Research Report **43,** London

Kenward, H. K. (1985a) Outdoor – Indoors? The Outdoor Component of Archaeological Insect Assemblages. In N. R. J. Fieller, D. D. Gilbertson and N. G. A. Ralph (eds.) *Palaeobiological Investigation: Research Design, Methods and Data Analysis*, 97-104. British Archaeological Reports **S266,** Oxford

Kenward, H. K. (1985b) The Insect Fauna. Berrington Street Site 4, Period 6, Pit 651. In R. Shoesmith, *Hereford City Excavations, 3, The Finds*, 96 + Fiche M9.B4-11. Council for British Archaeology Research Report **56**. London.

Kenward, H. K. (1988) Insect Remains. In K. Griffin, R. H. Okland, A. K. G. Jones, H. K. Kenward, R. W. Lie and E. Schia, Animal Bones, Moss, Plant, Insect and Parasite Remains. In E. Schia (ed.) *De Arkeologiske Utgravninger I Gamlebyen, Oslo*, **5**, 115-140. Alveheim and Eide, Ovre Ervik

Kenward, H. K. (1992) Rapid Recording of Archaeological Insect Remains – A Reconsideration. *Circaea, The Journal of the Association for Environmental Archaeology*, **9**, 81-88.

Kenward, H. K. (1995) Insects from the Lincoln Waterfront. In M. Jones (ed.) *Lincoln Archaeology 1994-1995*, **39**, City of Lincoln Archaeology Unit, Lincoln

Kenward, H. K. (1997) Synanthropic Decomposer Insects and the Size, Remoteness and Longevity of Archaeological Occupation Sites: Applying Concepts from Biogeography to Past 'Islands' of Human Occupation. In A. C. Ashworth, P. C. Buckland and J. P. Sadler (eds.) *Studies In Quaternary Entomology – An Inordinate Fondness For Insects.* Quaternary Proceedings **5**, 135-152

Kenward, H. K. and Allison, E. (1987b) Waterlogged Insect Remains from Southampton. *Ancient Monuments Laboratory Report* **124/87**, London. (Microfiche)

Kenward, H. K. and Allison, E. (1988) *Insect Remains From The Roman Fort at Papcastle, Cumbria.* Ancient Monuments Laboratory Report **145/88,** London

Kenward, H. K. and Allison, E. (1994) A Preliminary View of Insect Assemblages from The Early Christian Rath Site at Deer Park Farms, Northern Ireland. In D. J. Rackham (ed.) *Environment and Economy in Anglo-Saxon England*, 89-107. Council for British Archaeology Research Report **89,** London.

Kenward, H. K. and Allison, E. (1995) Rural Origins of the Urban and Insect Fauna. In A. R. Hall and H. K. Kenward (eds.) *Urban-Rural Connexions: Perspectives From Environmental Archaeology*, 55-78. Oxbow Monograph **47**, Oxford

Kenward, H. K. and Girling, M. (1986) *Arthropod Remains from Archaeological Sites in Southampton.* Ancient Monuments Laboratory Report **46/86,** London. (Microfiche)

Kenward, H. K. and Hall, A. R. (1995) *Biological Evidence from 16-22 Coppergate. Archaeology of York*, **14/7**. Council For British Archaeology for York Archaeological Trust, York.

Kenward, H. K. and Hall, A. R. (1997) Enhancing Bioarchaeological Interpretation Using Indicator Groups: Stable Manure as a Paradigm. *Journal of Archaeological Science*, **24**, 663-673

Kenward, H. K. and Large, F. (1995) Insects in Urban Waste Pits in Viking York: Another Kind of Seasonality. *Environmental Archaeology*, **3**, 35-53

Kenward H. K. and Large, F. (1998) Recording the Preservational Condition of Archaeological Insect Fossils *Environmental Archaeology* **2**, 49-60

Kenward, H. K. and Williams, D. (1979) *Biological Evidence from the Roman Warehouses in Coney Street. Archaeology of York,* **14/2,** Council for British Archaeology for York Archaeological Trust.

Kenward, H. K., Allison, E. P., Dainton, M., Kemenes, I. K. and Carrott, J. B. (1992b) *Evidence from Insect Remains and Parasite Eggs From Old Grapes Lane A Site, The Lanes, Carlisle.* Ancient Monuments Laboratory Report **78/92,** London

Kenward, H. K., Allison, E. P., Dainton, M., Kemenes, I. K. and Carrott, J. B. (1992c) *Evidence from Insect Remains and Parasite Eggs From Old Grapes Lane B Site, The Lanes, Carlisle.* Ancient Monuments Laboratory Report **77/92,** London

Kenward, H. K., Allison, E. P., Dainton, M., Kemenes, I. K. and Carrott, J. B. (1992a) *Evidence from Insect Remains and Parasite Eggs From Lewthwaite Lane A Site, The Lanes, Carlisle.* Ancient Monuments Laboratory Report **76/92,** London

Kenward, H. K., Engleman, C., Robertson, A. and Large, F. (1986) Rapid Scanning of Urban Archaeological Deposits for Insect Remains. *Circaea, The Journal of The Association For Environmental Archaeology,* **3,** 163-172

Kenward, H. K., Hall, A. R. and Jones, A. K. G. (1980) A Tested Set of Techniques for the Extraction of Plant and Animal Macrofossils from Waterlogged Archaeological Deposits. *Science and Archaeology,* **22,** 3-15

Kenward, H. K., Hall, A. R. and Jones, A. K. G. (1986) *Environmental Evidence from a Roman Well and Anglian Pits in the Legionary Fortress. Archaeology of York* **14/2,** Council for British Archaeology for York Archaeological Trust

Kenward, H. K., Large, F. and Skidmore, P. (1995) *Insect Remains From Excavations at Drum Castle, Aberdeenshire.* Reports from the Environmental Archaeology Unit, York, **95/46**

Kenward, H. K., Williams, D., Spencer, P. J., Greig, J. R. A., Rackham, D. J. and Brinklow, D. A. (1978) The Environment of Anglo-Scandinavian York. In R. A. Hall (ed.) *Viking Age York and The North,* 58-70). Council for British Archaeology Research Report **27,** London

Kimmins, D. E. (1954) Coleoptera. In R. E. M. Wheeler, *The Stanwick Fortifications, North Riding of Yorkshire,* 58. Research Reports of The Society of Antiquaries of London, **17,** Oxford.

Kislev, M. E. (1991) Archaeobotany and Storage Entomology. In, J. M. Renfrew (ed.) *New Light On Early Farming. Recent Developments In Palaeoethnobotany,* 121-136, Edinburgh University Press.

Koch, K (1971) Zur Untersuchung Subfossiler Käferreste Aus Römerzeitlichen Und Mittelalterlichen Ausgrabungen Im Rheinland. *Rheinische Ausgrabungen.* **10,** 378-448

Koch, K. (1989) *Die Käfer Mitteleuropas* **1.** Goecke and Evers, Krefeld

Koch, K. (1992) *Die Käfer Mitteleuropas* **3.** Goecke and Evers, Krefeld

Krzywinski, K. (1983) Recent Palaeoethnobotanical Work at Medieval Excavations at Bryggen, Bergen, Norway, In B. Proudfoot (ed.) *Site, Environment and Economy*, 145-69. British Archaeological Report, **S173**, Oxford

Landin, B-O (1961) Ecological Studies of Dung Beetles. *Opuscula Entomologica Supplementum* **XIX**, 1-228

Landsberg, S. (1996) *The Medieval Garden*, London

Lane, S. (1992) *A Provisional Atlas of the Chrysomelid Beetles of Warwickshire* Warwickshire Museum Service, Warwick

Lemdahl, G., Aronsson, M. & Hedenäs, L. (1995) Insekter från ett medeltida handelfartyg. *Entomologiske Tidskrift*, **116**, 169-174

Levinson, H. Z. and Levinson, A. R. (1985) Storage and Insect Species of Stored Grain and Tombs in Ancient Egypt. *Zeitschrift Fürangewandte Entomologie*, **100**, 321-339

Lindroth, C. H. (1974) Coleoptera Carabidae *Handbooks for the Identification of British Insects*, **IV 2.**, Royal Entomological Society of London

Lindroth, C. H. (1985) The Carabidae (Coleoptera) of Fennoscandia and Denmark Fauna *Entomologica Scandinavia* **151** E.J. Brill. Leiden

Lindroth, C. H., Andersson, H., Bodvarsson, H. & Richt (1973) Surtsey Island, the development of a new fauna 1963-1970. *Terrestrial Invertebrates Entomologa Scandinavia Supplement.* **5**

Locke, J. (1982) Beetle Assemblages at 57 Albert Street and Mounthoolie Lane. In N. A. McGavin, Excavations in Kirkwall, (1978). *Proceedings of The Society of Antiquaries of Scotland*, **112**, 426-428

Loewenfeld, C. and Back, P. (1978) *The Complete Book of Herbs and Spices*, David and Charles, Newton Abbot

Lucht, W. H. (1987) *Die Käfer Mitteleuropas*, Katalog, Goecke and Evers, Krefeld

Luff, M. L., Eyre, M. D., Rushton, S. P. (1989) Classification and ordination of habitats of ground beetles (Coleoptera, Carabidae) in north-east England. *Journal of Biogeography* **16**, 121-130

Lumaret J-P and Kirk, A. A. (1991) In Hanski, I. and Cambefort, Y. (eds), *Dung Beetle Ecology*, Princeton University Press

Lyell, A. H. (1911) Appendix on the Insect Remains. In T. Ashby, A. E. Hudd and F. King, Excavations at Caerwent, Monmouthshire, on the Site of the Romano-British City of *Venta Silurum*, in the Years 1909 and 1910. *Archaeologia*, **62**, 445-447

MacArthur, R. H. (1957) On the Relative Abundances of Bird Species. *Proceedings of the National Academy of Science, USA*, **43**, 293-295

MacArthur, R. H. and Wilson, E. O. (1967) *The Theory of Island Biography*, Princeton

MacPhail, R. I. (1994) Reworking of urban stratigraphy by human and natural processes A. R. Hall and H. J. Kenward (eds) *Urban-Rural Connexions Perspectives from Environmental Archaeology* Symposium of the Association for Environmental Archaeology **12**. Oxbow Monograph **47**

Magurran, A.E. (1988) *Ecological diversity and its measurement*, London

Matthews, J. V. Jr. (1976a) Evolution of the Subgenus Cyphelophorus (Genus *Helophorus*, Hydrophilidae, Coleoptera) : Description of Two New Fossil Species and Discussion of *Helophorus tuberculatus* Gyll. *Canadian Journal of Zoology*, **54**, 652-673

Matthews, J. V. Jr. (1976b) Insect Fossils From The Beaufort Formation: Geological and Biological Significance. *Geological Survey of Canada, Papers*, **76-1B**, 217-227

McEvedy, C. (1967) *Penguin Atlas of Medieval History*, London

Miller, N, Williams, D. and Kenward, H. K. (1993) Plant Macrofossils and Insect Remains From Mytongate. In D. H. Evans (ed.) *Excavations In Hull 1975-76*, 195-198 + Fiche 2/A7-C3. East Riding Archaeologist 4, Hull Old Town Report Series 2

.

Ministry of Technology (1970) *The Common Furniture Beetle*, Forest Productivity. Research Laboratory. Technical Note **47**

Moffett, L. and Smith, D. (1997) Insects and Plants From A Late Medieval and Early Post-Medieval Tenement In Stone, Staffordshire, U.K. *Circaea, The Journal of The Association For Environmental Archaeology*, **12**, 157-175

Morris, M. G. (1997) Broad-nosed weevils Coleoptera Curculionidae Entiminae *Handbooks for the Identification of British Insects* British Museum (Natural History) **5 Part 17A** London

Moulins, D. De (1990) Environmental Analysis. In C. Mahony and D. De Moulins, *The Archaeology of Roman London 1. The Upper Walbrook In The Roman Period*, 85-152. Council for British Archaeology Research Report **69**. London

Munro, J. W. (1966) *Pests of stored products.* Hutchinson, London

Murphy, K (1989) Analyses of a Cesspit Fill from the Tudor Merchant's House, Tenby, Dyfed. *The Bulletin of the Board of Celtic Studies* **36**, 255

Nielsen, B. O., Mahler, V. and Rasmussen, P. (2000) An Arthropod Assemblage and the Ecological Conditions in a Byre at the Neolithic Settlement of Weier, Switzerland, *Journal of Archaeological Science* **27**, 209-218

Noe-Nygaard, B. (1982) The Applicability of Insect Finds to the Interpretation of Archaeological Sites. In, *Second Nordic Conference On The Application of Scientific Methods In Archaeology, Helsingfors*, Pact, Journal of The European Study Group on Physical, Chemical and Mathematical Techniques Applied to Archaeology, 7, 239-245

O'Connor, J. P. (1989) *The Animal Bones from 16-22 Coppergate Archaeology of York*, **15/7** Council for British Archaeology for York Archaeological Trust

Osborne, P. J. (1969) An Insect Fauna of Late Bronze Age Date from Wilsford, Wiltshire. *Journal of Animal Ecology*, **38**, 555-566

Osborne, P. J. (1971a) The Insect Fauna from the Roman Harbour. In B. W. Cuncliffe, *Excavations at Fishbourne, 1961-1969*, 393-396. Research Reports of the Society of Antiquaries of London, **27**, Oxford

Osborne, P. J. (1971b) An Insect Fauna from the Roman Site at Alcester, Warwickshire. *Britannia*, **2**, 156-165

Osborne, P. J. (1973) Insects in Archaeological Deposits. *Science and Archaeology*, **10**, 4-6

Osborne, P. J. (1975) The Coleoptera from the Roman Well (on the Intervallum Road, East of the Gyrus). In B. Hobley, *The Lunt Roman Fort and Training School for Cavalry, Bagington, Warwickshire.* Transactions of the Birmingham and Warwickshire Archaeological Society, **87**, 44-46

Osborne, P. J. (1977) Stored Product Beetles from a Roman Site at Droitwich, England. *Journal of Stored Products Research*, 13, 203-204

Osborne, P. J. (1978) Insect Evidence for the Effect of Man on the Lowland Landscape. In S. Limbrey and J. G. Evans (eds.) *The Effects of Man on the Landscape: The Lowland Zone*, 32-34. Council For British Archaeology Research Report **21**, London

Osborne, P. J. (1979) Insect Remains. In C. Smith (ed.) *Fisherwick: The Reconstruction of An Iron Age Landscape*, 85-87 and 189-193, British Archaeological Reports, **61**, Oxford

Osborne, P. J. (1981a) Coleopterous Fauna from Layer 1. In J. R. A. Greig, The Investigation of a Medieval Barrel Latrine from Worcester. *Journal of Archaeological Science*, **8**, 268-271

Osborne, P. J. (1981b) The Insect Fauna. In M. G. Jarrett and S. Wrathmell, Whitton. *An Iron Age and Roman Farmstead In South Glamorgan*, 245-248. University of Wales Press, Cardiff

Osborne, P. J. (1982) Report on the Insect Remains from Cirencester. In J. Wacher and A. McWhirr (eds.) *Early Roman Occupation at Cirencester*, 232. Cirencester Excavations, **1**, Cirencester Excavation Committee

Osborne, P. J. (1983) An Insect Fauna from a Modern Cesspit and Its Comparison with Probable Cesspit Assemblages from Archaeological Sites. *Journal of Archaeological Science*, **10**, 453-463

Osborne, P. J. (1984) Insect Remains. In P. Leach (ed.) *The Archaeology of Taunton Excavations and Fieldwork To 1980*, 165-166. Western Archaeological Trust, Excavation Monograph **8**

Osborne, P. J. (1994a) Insect Remains from Pit F and Their Environmental Implications. In S. Cracknell and C. Mahany (eds.) *Roman Alcester: Southern Extramural Area. 1964-1966 Excavations, Part 2: Finds and Discussion*, 217-220. Council for British Archaeology Research Report **97**, London

Osborne, P. J. (1994b) The Insects. In P. Bidwell and S. Speak, *Excavations at South Shields Roman Fort I*, 266. Society of Antiquaries of Newcastle Upon Tyne with Tyne and Wear Museums Monograph Series **4**. Newcastle Upon Tyne

Osborne, P. J. (1996) An Insect Fauna of Roman Date From Stourport, Worcestershire, U. K., and Its Environmental Implications. *Circaea, The Journal of the Association For Environmental Archaeology*, **12**, 183-189

Osborne, P. J. (1997) Insects, Man and Climate in the British Holocene. In A. C. Ashworth, P. C. Buckland and J. P. Sadler (eds.) *Studies In Quaternary Entomology – An Inordinate Fondness For Insects.* Quaternary Proceedings **5**, 193-198

Osborne P. J. (unpub.) *Report on the insect faunas from Winchester*

Owen, J. (1991) *The Ecology of a Garden*, Cambridge

Palm, T., (1959) Die Holz und Rindenkäfer der sud- und mittelschwedischen Laudbaume *Opuscula Entomologica Supplementum* Suppl. **16**

Pals, J. P. and Hakbijl, T. (1992) Weed and Insect Infestation of a Grain Cargo in a Ship at The Roman Fort of Laurium In Woerden (Province of Zuid-Holland). *Review of Palaeobotany and Palynology*, **73**, 287-300

Panagiotakopulu, E. (2000) *Archaeology and Entomology in The Eastern Mediterranean. Research into the History of Insect Synanthropy in Greece and Egypt.* British Archaeological Reports International Series **836,** Oxford

Peacock, E.R. (1977) Coleoptera Rhizophagidae *Handbooks for the Identification of British Insects,* **V 5(a)** Royal Entomological Society of London

Pearson, E. and Robinson, M. (1995) Environmental Evidence from the Villa. In, R. J. Williams and R. J. Zeepvat, Bancroft. The Late Bronze Age and Iron Age Settlements and Roman Temple-Mausoleum, *The Roman Villa, 2. Finds and Environmental Evidence*, 565-584. Buckingham Archaeological Society Monograph 7

Perry, D. W. (1981) Cluster Analysis of the Insect Remains Beneath the "Raft". In S. McGrail (ed.) *The Brigg "Raft" and Her Prehistoric Environment*, 176-182. British Archaeological Reports, **89**, Oxford

Perry, D. W., Buckland, P. C. and Snæsdóttir, M. (1985) The Application of Numerical Techniques To Insect Assemblages From The Site of Stóraborg, Iceland. *Journal of Archaeological Science*, **12**, 335-345

Petherbridge, F. R. (1928) The Turnip mud beetles (*Helophorus) Annals of Animal Biology* **15**, 659-678

Peyerimhoff, P. de (1945) Les Genres de Coleopteres importes ou acclimates dans la fauna euro-mediterraneene *Revue Francaise d'Entomologie* **12**, 5-11

Phipps, J. (1986) The Efficiency of Paraffin Flotation For The Separation of Dipterous and Coleopterous Material. *Circaea, The Journal of The Association For Environmental Archaeology* **4**, 65-68

Pike, M. L., and Biddle, M. (1966) Parasite Eggs in Medieval Winchester. *Antiquity* **40**, 293-296

Platt, C. (1976) *The English Medieval Town*, Secker and Warburg .

Platt, C. and Coleman, R. (1975) *Excavations in Medieval Southampton 1953-1969*, 2 vols. Leicester

Pliny, *Natural History* Vol. **VI**, Books **XX-XXIII**, translated by W.H.S. Jones (1969)

Ponel, P. and Yvenic, J.-H. (1997) L'Archéoentomologie en France. *Les nouvelles de l'archéologie*, **68**, 31-37

Poole, R. W. (1974) *An Introduction to Quantitative Ecology*, McGraw-Hill Kogakusha, Tokyo

Reiss, R.. A., Schwert, D. P., and Ashworth, A. C. (1995) Field Preservation of Coleoptera for Molecular Genetic Analyses *Physiological and Chemical Ecology* Entomological Society of America Vol.**24**, 3

Reitter, (1911) *Fauna Germanica Die Käfer des Deutchen* Reiches Stuttgart

Ridley, C. and Wardle K. A., (1979), Ancient Agriculture and Ecology at Servia., In *Rescue Excavations at Servia 1971-1973 a Preliminary Report,* Annual Report of the British School at Athens, 74, 226-9

Robinson, M. A. (1975) The Environment of the Roman Defences at Alchester and Its Implications. *Oxoniensia*, **40**, 161-170

Robinson, M. A. (1978) Insect and Seed Remains. In A. C .C. Brodribb, A .R. Hands and D. R. Walker, *Excavations at Shakenoak Farm, Near Wilcote, Oxfordshire. Part V: Sites K and E,* 161-164. British Archaeological Reports, Oxford.

Robinson, M. A. (1979) The Biological Evidence. In G. Lambrick and M. A. Robinson, *Iron Age and Roman Riverside Settlements at Farmoor, Oxfordshire*, 77-133. Council For British Archaeology Research Report, **32**, London

Robinson, M. A. (1980) Appendix 10: Insect Remains. In P. M. Christie and J. G. Coad, Excavations at Denny Abbey. *Archaeological Journal*, **137**, 267

Robinson, M. A. (1981a) Roman Waterlogged Plant and Invertebrate Evidence. In J. Hinchliffe and R. Thomas, Archaeological Investigations at Appleford. *Oxoniensia*, **45**, 90-106.

Robinson, M. A. (1981b) The Iron Age To Early Saxon Environment of The Upper Thames Terraces. In M. Jones and G. Dimbleby (eds.) *The Environment of Man: The Iron Age to the Anglo-Saxon Period,* 251-286. British Archaeological Reports **87**, Oxford

Robinson, M. A. (1981c) Waterlogged Plant and Invertebrate Evidence. In N. Palmer, A Beaker Burial and Medieval Tenements In The Hamel, Oxford. *Oxoniensia*, **45**, 199-206 + Fiche.

Robinson, M. A. (1983a) Arable/Pastoral Ratios From Insects. In M. Jones (ed.) *Integrating The Subsistence Economy*, 19-47. British Archaeological Reports **S181**, Oxford.

Robinson, M. A. (1983b) The Insect Remains. in J. H. Williams and D. Farwell, Excavations of A Saxon Site In St. James' Square, Northampton, 1981. *Northamptonshire Archaeology*, **18,** Fiche M33 and M38

Robinson, M. A. (1984) Plant and Invertebrate Remains. In C. Halpin, Late Saxon Evidence and Excavation of Hinxey Hall, Queen Street, Oxford. *Oxoniensia*, **48**, 69 + fiche

Robinson, M. A. (1985) 33 St. Aldgates: Agricultural Debris against the Norman Bridge. In B. Durham, the Thames Crossing at Oxford: Archaeological Studies 1979-82. *Oxoniensia*, **49**, 78-79

Robinson, M. A. (1986) Plant and Invertebrate Remains from the Priory Drains. In G. Lambrick, Further Excavations on the Second Site of The Dominican Priory, Oxford. *Oxoniensia*, **50,** 196-201 + Fiche E10-F1

Robinson, M. A. (1991) The Neolithic and Late Bronze Age Insect Assemblages. In S. Needham, *Excavation and Salvage at Runnymede Bridge, 1978: The Late Bronze Age Waterfront Site*, 277-325. British Museum, London

Robinson, M. A. (1992) The Coleoptera From Flag Fen. *Antiquity*, **66**, 467-469

Robinson, M. A. (1994) Excavation and Environmental Archaeology at Mingies Ditch. In R. Luff and P. Rowley-Conwy (eds.) *Whither Environmental Archaeology?* 105-114. Oxbow Monograph **38**, Oxford

Robinson, M. A. and Wilson, R. (1987) A Survey of Environmental Archaeology in the South Midlands. In H. C. M. Keeley (ed.) *Environmental Archaeology: A Regional Review*, **2**, 16-100. Historic Buildings and Monuments Commission for England Occasional Paper **1**. London

Robinson, M. A., Dickson, J. H. and Greig, J. R. A. (1984) Waterlogged Plant and Invertebrate Evidence. In D. Miles (ed.) *Archaeology at Barton Court Farm, Abingdon, Oxon.*, Microfiche Chapters VIII and IX. Council for British Archaeology Research Report **50**. London

Sabine, E. L. (1934) Latrines and Cesspools of Medieval London, *Speculum*, **9**, 303-321

Sadler, J. P. (1991) *Archaeological and Palaeoecological Implications of Palaeo-entomological Studies in Orkney and Iceland.* Unpubl. Ph.D. Thesis, University of Sheffield

Sadler, J. P. and Skidmore, P. (1995) Introductions, Extinctions or Continuity? Faunal Change in the North Atlantic Islands. In R. Butlin and N. Roberts (eds.) *Ecological Relations In Historical Times*, 206-225. Institute of British Geographers, Blackwell, Oxford

Samuels, J. and Buckland, P. C. (1978) A Romano-British Settlement at Sandtoft, South Humberside. *Yorkshire Archaeological Journal*, **50**, 65-75

Scobie, G. D., Zant, J. M. and Whinney, R (1991) *The Brooks, Winchester A preliminary report on the excavations, 1987-88*, Winchester Museums Service

Shennan, S. (1997) *Quantifying Archaeology*, Edinburgh University Press

Shirt, D. B. (ed.) (1987) *British Red Data Books 2 Insects* Nature Conservancy Council, Peterborough

Shotton, F. W. (1959) Insects in Pleistocene Deposits. *Journal of the Institute of Biology*, **6**, 63-65

Skidmore, P (1996) *Insects of the British Cow Dung Community* Field Studies Council

Smith, D. N. (1989) Insect Remains From Site DSR. In P.C.Buckland, J. R. Magilton and C. Hayfield, *The Archaeology of Doncaster 2. The Medieval and Later Town*, 447-450. British Archaeological Reports **202**. Oxford

Smith, D. N. (1991) *An Investigation of the Potential of Modern Analogue Faunas to Act as Comparisons To Palaeoentomological Samples from Archaeological Deposits.* Unpubl. Ph.D. Thesis, University of Sheffield

Smith, D. N. (1996) Thatch, Turves and Floor Deposits: A Survey of Coleoptera in Materials from Abandoned Hebridean Blackhouses and the Implications for Their Visibility in the Archaeological Record. *Journal of Archaeological Science*, **23**, 161-174

Smith, D. N. (1998) Beyond the Barn Beetles: difficulties in using Coleoptera as Indicators of Stored Fodder. *Environmental Archaeology* **1**, 63-70.

Smith, D. N., Osborne, P. J. and Barrett, J. (1997) Preliminary Palaeoentomological Research at the Iron Age Sites at Goldcliff, Gwent, Wales, 1991-1993. In A. C. Ashworth, P. C. Buckland and J. P. Sadler (eds.) *Studies In Quaternary Entomology – An Inordinate Fondness For Insects.* Quaternary Proceedings **5**, 255-268.

Solomon, M. E., and Adamson, E. (1955) The Powers of Survival of Storage and Domestic Pests under Winter Conditions in Britain, In *Bulletin of Entomological Research*, **46**, 311-355

Stafford, F. (1971) Insects of A Medieval Burial. *Science and Archaeology*, **7**, 6-10

Steer, F. W. (1958) The Vicars' Hall, Chichester and its Undercroft, *Chichester Papers Collection*, No. **12**

Straker, V., Robinson, M. and Robinson, E. (1984) Biological Investigations of Waterlogged Deposits in The Roman Fortress Ditch at Exeter. *Devon Archaeological Society Proceedings*, **42**, 59-69

Strudwick, C. D. (1979) *A Multivariate Analysis of Archaeological Insect Assemblages.* Unpub. M.Sc. Thesis University of York, York

Stuiver, M., Grootes, P. M., and Braziunas, T. F. (1995) The GISP2 $\delta^{18}O$ Climate Record of the Past 16,500 Years and the Role of the Sun, Oceans and Volcanoes. *Quaternary Research* **44**, 341-354

Sudell, T. L. (1990) The Insects From Well 1. In S. Wrathmell and A. Nicholson (eds.) *Dalton Parlours: Iron Age Settlement and Roman Villa Site*, 267-271. Yorkshire Archaeology **3**. West Yorkshire Archaeology Service, Wakefield

Ter Braak, C. J. F. (1988) *A Fortran program for canonical community ordination by partial, detrended, canonical correspondence analysis, principal components analysis and redundancy analysis (version 2.1). (with some alterations) from the technical report 87* ITI A 11 of the TNO, Institute of Applied Computer Science, Statistics Dept. Wageningen

Thompson, C. G. (1976), A Review of the Genus *Anotylus* in P. M. Hammond (ed), *Bulletin of the British Museum of Natural History (Entomology)*, **33**, 139-87

Tudge, C. (2000) *The Variety of Life*, Oxford

Tusser, T. (1984) *Five Hundred Points of Good Husbandry*, Rivenhall Oxford University Press

Tyers, I. (1988) Environmental Evidence from Southwark and Lambeth. In P. Hinton (ed.) *Excavations In Southwark 1973-76 Lambeth 1973-79*, 443-477. Joint Publication **3**, London and Middlesex Archaeological Society and Surrey Archaeological Society

Valamoti, S. M. and Buckland, P. C. (1995) An Early Find of *Oryzaephilus Surinamensis* L. (Coleoptera: Silvanidae) From Final Neolithic Mandalo, Macedonia, Greece. *Journal of Stored Product Research*, **31**, 307-309

Varley, G. C. (1980) Insect Remains. In T. G. Hassall, Excavations at Oxford Castle 1965-1973. *Oxoniensia*, 41, 308

Verdcourt B. (1994) *Uleiota planata* (L.) Coleoptera Cucujidae, *Enicmus rugosus* (Hbst.) Coleoptera Lathridiidae) and others insects under beech bark in Berkshire *Entomologist's Monthly Magazine*, **130**, 62-63

Wagner, P. E. (1997) Human Impact or Cooling Climate? The "Little Ice Age" and The Beetle Fauna of The British Isles. In A. C. Ashworth, P. C. Buckland and J. P. Sadler (eds.) *Studies In Quaternary Entomology - An Inordinate Fondness For Insects*. Quaternary Proceedings **5**, 269-276

Wagner, P. E. and Pelling , R. (1995) *Environmental evidence from the moat at Wood Hall, Womersley, North Yorkshire*, Sheffield Environmental Facility Project **9404**

Walker, D. (1995) *The Normans in Britain*. Historical Association Studies, Blackwell

Walker, M. J. C., Bohncke, S. J. P., Coope, G. R., O'Connell, M., Usinger, H. and Verbruggen, C. (1994) The Devensian/Weichselian Late-Glacial In Northwest Europe (Ireland, Britain, North Belgium, The Netherlands, Northwest Germany). *Journal of Quaternary Science* **9**, 109-118.

Walton, P. (1989) *Textiles, Cordage and Raw Fibre from 16-22 Coppergate Archaeology of York*, **17/6**. Council for British Archaeology for York Archaeological Trust

Waterhouse, C. O. (1912) Appendix IV. Report on the Insect-Remains. In S. H. Warren, On A Late Glacial Stage In The Valley of The River Lea, Subsequent To The Epoch of River-Drift Man. *Quarterly Journal of The Geological Society*, **68**, 241

West, R. (1987) *Thatch*, David and Charles, Newton Abbot

West Stow Environmental Archaeological Group (1974) *Experiments in the Anglo-Saxon Environment*, British Archaeological Reports, **6**

Whitehead, P. F. (1992) *Onthophagus fracticornis* (Preyssler) and *O. nutans* (F.) (Col. Scarabaeidae) as Fossils in Worcestershire with Comments on the Genus. *Entomologist's Monthly Magazine*, **128**, 31-32

Whitehouse, N. J. (1998) *The Evolution of the Holocene Wetland Landscape of the Humberhead Levels from a Fossil Perspective.* Vols. 1 & 2 Unpubl. Ph.D., University of Sheffield

Wickham, H. F. (1919) Fossil Beetles From Vero, Florida. *American Journal of Science* (4th Ser.), **47**, 355-357

Williams, B. S. (1930) A New Method of Capturing Coleoptera in Flight, *Entomologists Monthly Magazine* **46**, 253-5

Wood, M. (1965) *The English Medieval House*

Woodroffe, G. E. (1953) An Ecological Study of the Insects and Mites in the Nests of Certain Birds in Britain, In *Bulletin Of Entomological Research*, **44**, 739-772

Woodroffe, G. E. (1967) Phoretic Behaviour of Adult *Aglenus brunneus* (Gyll.) (Col. Colydiidae). *Entomologist's Monthly Magazine* **135**, 76

Yvinec, J.-H. (1997) Infestation par les insectes d'un grenier carbonisé de la fin du IIe siècle A.D. à Amiens (Somme). *L'Entomologiste* (Paris), **53**, 113-128

Zacher, F. (1927) *Die Vorrats-, Speicher- und Materialschädlinge und ihre Bekämpfung.* Berlin

Zacher, F. (1937) Vorratschädlinge Und Vorratschutz, Ihre Bedeutung Für Volksernahrung Und Weltwirtschaft. *Zeitschrift Für Hygienische Zoologie Und Schädlingsekämpfung*, **29**, 1-11