

Hullbridge Survey, Site 9: Macrofossil analysis of clays beneath the Upper Peat

Samples were taken at depths of 10-15cm, 20-25cm and 30-35cm below the top surface of the Upper Peat in order to investigate vegetational change at the Middle Clay/Upper Peat contact.

Methods of extraction were as described in earlier reports.

(a) Clay at 30-35cm

The most abundant seeds in this sample were of Salicornia sp (glasswort), comprising 37% of the total seed assemblage. No other remains of obligate halophytes were identified and it therefore seems that these seeds are derived from Salicornia plants colonising intertidal mudflats, rather than from a salt-marsh community. The remaining fruits and seeds are from freshwater aquatic, reedswamp and marsh plants (Ranunculus subg. Batrachium, Rorippa cf. microphylla, Rumex maritimus, Mentha arvensis/aquatica, Alisma plantago-aquatica, Sparganium sp, Juncus spp, Lemna sp, Typha sp, Eleocharis palustris/uniglumis and partly degraded grass fruits, probably of Glyceria fluitans). Some of these taxa are able to tolerate a degree of salinity. Similar mixed assemblages including seeds of halophytes and freshwater species are reported from estuarine sediments associated with the prehistoric raft at Brigg (Hillman 1981), where it was concluded that buoyant seeds of freshwater plants were perhaps derived from plant communities further upstream, beyond the tidal limits.

(b) Clay at 20-25cm

The fruits and seeds from this sample are almost entirely of freshwater aquatic and wetland plants, though a very few Salicornia seeds (about 1% of the total assemblage) are present. The most abundant taxa are Rumex maritimus, Bidens cernua, Alisma plantago-aquatica, Lemna sp, Eleocharis palustris/uniglumis, and grass fruits probably of Glyceria fluitans. Fruits of Typha are present but rare, accounting for under 2% of the assemblage. The fruits and seeds from this clay indicate deposition in an open predominantly freshwater environment.

(c) Peaty clay at 10-15cm

Fruits of Typha sp are extremely abundant in this sample. It is estimated that they make up over 90% of the total assemblage. Most of the remaining fruits and seeds are of Mentha cf. aquatica and Alisma plantago-aquatica. There are

no rhizomes of reedswamp plants in the sample examined, though drifted monocotyledonous plant remains (leaf and stem fragments) are quite common. This indicates that the deposit where sampled was formed in open freshwater in close proximity to Typha reedswamp.

Macrofossil analysis confirms ~~that~~ results obtained from diatom analysis of this contact. The clays immediately beneath the Upper Peat were formed in freshwater conditions.

Deptr. / cm.	10-15	20-25	30-35
<u>Ranunculus</u> subg. <u>Batrachium</u>	-	2	7
<u>Ranunculus</u> sp.	3	-	-
<u>Rorippa</u> cf. <u>microphylla</u> (Boenn) Hyl.	-	1	1
<u>Stellaria</u> cf. <u>palustris</u> Retz.	-	1	-
<u>Salicornia</u> sp.	-	4	78
<u>Hydrocotyle</u> <u>vulgaris</u> L.	2	-	-
<u>Cicuta</u> <u>virosa</u> L.	19	3	-
<u>Oenanthe</u> <u>aquatica</u> (L) Porret.	-	1	-
Umbelliferae indet. (frags)	2	1	-
<u>Rumex</u> <u>maritimus</u> L. (perianths)	-	46	4
<u>Rumex</u> sp. (nutlets)	14	45	1
<u>Mentha</u> cf. <u>aquatica</u> L.	116	5	1
<u>Lycopus</u> <u>europaeus</u> L.	28	-	-
<u>Scutellaria</u> cf. <u>galericulata</u> L.	16	-	-
<u>Bidens</u> <u>cernua</u> L.	-	30	-
<u>Bidens</u> sp. (frags)	3	22	-
<u>Alisma</u> <u>plantago-aquatica</u> L.	104	19	1
Alismataceae indet. (embryos)	142	57	22
<u>Juncus</u> spp.	-	p	va
<u>Lemna</u> sp.	7	13	4
<u>Sparganium</u> sp. (a)	-	6	1
<u>Typha</u> sp. (b)	c4700	7	3
<u>Eleocharis</u> <u>palustris/uniglumis</u>	-	22	42
<u>Carex</u> <u>vesicaria/rostrata</u>	16	-	-
<u>Carex</u> sp.	10	1	-
Gramineae cf. <u>Glyceria</u> <u>fluitans</u> (c)	-	82	29
Gramineae	5	-	-
Monocotyledones (leaf, stem frags)	p	-	-
Indeterminate seeds	22	5	17
Mosses	p	-	p
Cladoceran ehippia	p	p	p
Insect remains	p	p	p
Sample weight (kg)	0.5	0.5	0.5

Table : Macrofossils from site 9

Unless otherwise indicated plant taxa are represented by fruits or seeds.

Abbreviations: p = present va = very abundant.

Notes: (a) Badly degraded fruits. (b) Numbers estimated from sub-sample.

(c) Medium-sized fruits with elongate linear hilum ending close to fruit apex. Transverse cells not obvious, but most specimens show a polyhedral pattern of cells with brown deposits (cf. Körber-Grohne 1964).