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IDENTIFICATION AND TREE-RING ANALYSIS OF WOOD FROM COLLINS CREEK, BLACKWATER INTER-TIDAL ZONE, ESSEX, 1993 - A PILOT STUDY

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IDENTIFICATION AND TREE-RING ANALYSIS OF WOOD FROM COLLINS CREEK, BLACKWATER INTER-TIDAL ZONE, ESSEX, 1993 - A PILOT STUDY

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Summary

The analysis of a small number of posts from timber structures in the Blackwater Estuary indicates that further dendrochronological analysis is probably not viable, although a woodland characterisation study may provide useful non-chronological information.

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Identification and tree-ring analysis of wood from Collins Creek, Blackwater inter-tidal zone, Essex, 1993 - a pilot study

Introduction

A preliminary archaeological survey on a series of timber alignments is currently being carried out by Essex County Council. The site is located in the inter-tidal zone of the Blackwater Estuary, approximately 2km east of Osea Island (TL945075). The timber 'structures', which are up to 1km in length, consist of rows of posts. The remains of wattling is sometimes apparent between rows.

Two radiocarbon dates have been obtained which indicate a Saxon date for the structures, but it is thought that the site may well be multiperiod with the possibility of some of the alignments dating to the prehistoric period. Following a site visit by the Sheffield Dendrochronology Laboratory staff, it was decided that a small pilot project be undertaken to determine the dendro-chronological potential of the site. A total of 32 samples from three areas were obtained for identification and assessment purposes.

Methodology

The samples were prepared for analysis by freezing them for a minimum of 48 hours and then planing the cross-sectional surface so that each growth ring is clearly defined. At this stage the dimensions of the cross-section and the number and orientation of the rings were recorded. The wood type of each sample was also determined. Oak (*Quercus* spp) is relatively easy to recognise as it is a ring porous species with wide medullary rays running from pith to bark and a flame-like distribution of pores in the latewood (Schweingruber 1990). The other samples were identified by taking thin sections of wood from the transverse, tangential and radial planes and making temporary slides. The identification of these slides was through reference material in the form of permanent slides, an identification key (Schweingruber 1978; 1990) and a computer database (*"Guess"* - see Wheeler *et al* 1986). The samples with 50 or more rings were then analysed using standard

dendrochronological techniques (Baillie 1982). Crossmatching procedures were carried out on an Atari microcomputer using software written by Ian Tyers (pers comm 1992) based on the Belfast CROS program (Baillie & Pilcher 1973; Munro 1984).

Results

Full details of the samples are presented in Table 1. Twenty six samples were identified as oak, five as *Betula* spp and one as *Salix/Populus* type. Non-oak samples were only present in area 3, as were timbers with injury scars. All samples were roundwood and most had both pith and bark surface. The vast majority of the timbers were in the 10-35 year age range at felling.

The minimum number of rings acceptable for absolute dating purposes is usually 50 (Hillam *et al* 1987). Consequently only two oak samples (14, 27B), from different alignments, were considered potentially suitable for dendrochronological analysis. The ring sequences from these two samples did not crossmatch. In general where there are only two ring sequences available of 50 and 51 years respectively dating would not be attempted. Single samples, particulary those with less than 100 rings, are far less likely to give a reliable date than a well replicated site master curve (Hillam *et al* 1987). However as there is a Saxon chronology available from nearby Mersea Strood (Hillam 1981), it was considered appropriate to attempt to date the Collins Creek samples. Both ring sequences were tested against the Mersea sequence and other dated Saxon reference chronologies from East Anglia and the London region. No consistent results were found for either ring sequence so the timbers remain undated.

Future work

From a dendrochronological view point it seems unwise to proceed further. The alignments investigated appear to be constructed of young timber that is unsuitable for dating purposes. Thus it seems that it would be more beneficial to the archaeological survey to embark on a more detailed radiocarbon dating program, perhaps obtaining series of samples from the different area/alignment types.

The vast quantities of material available appear to be suitable for woodland characterisation studies if this is deemed applicable. The pilot study has shown that the samples from areas 1 and 2 consist entirely of oak, whilst those of other species are present in area 3. (Area 3 was also the only one which had samples with injury scars.) A large scale woodland characterisation study would allow comparisons to be made between areas/alignments with regard to differences in species utilisation and age range of material. Particular patterns in the use of winter and summer felled material within individual alignments may become apparent. Information may also be obtained concerning possible woodland management practices. The extensive sampling required for such a study may well have the added bonus of locating sufficient samples to make dendrochronological analysis feasible at a later stage in the survey.

Acknowledgements

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Table 1: Details of the samples. AGR - average growth rate (mm/year); the dimensions exclude the bark.

Sample number	Species	Total no of rings	Sapwood rings	AGR	Dimensions (mm)	Comments
Area 1						
01	Quercus spp	33	12	2.3	145x125	bark - felled summer; knots
02	Quercus spp	23	9	2.3	105x105	bark?
03	Quercus spp	20-25	7	1.7	80x75	bark - felled winter
04	Quercus spp	25-30	25-30	1.5	85x75	bark; knots
05	Quercus spp	18	8	2.8	105x105	bark
06	Quercus spp	23-25	14	2.2	100x90	bark - felled winter; pith rotted
07	Quercus spp	19	19	3.2	110x100	bark - felled summer
Area 2						
08	Quercus spp	27	14	2.6	145x130	bark - felled winter
09	Quercus spp	21	11	3.7	145x145	bark - felled summer
11	Quercus spp	23	14	2.4	135x115	bark - felled winter
12	Quercus spp	35	18	2.1	175x135	bark
13	Quercus spp	32	17	1.3	90x75	bark - felled winter
14	Quercus spp	50	17	1.1	135x120	bark - felled summer
15	Quercus spp	18	16	2.7	95x90	bark - felled summer
16	Quercus spp	26	14	2.7	135x130	bark - felled winter
17	Quercus spp	28	13	2.5	140x120	bark - felled winter; pith rotted
18	Quercus spp	39	19	1.3	120x90	bark
19	Quercus spp	32	18	1.9	125x115	bark
Area 3						
20	Salix/Populus	21	-	3.8	145x140	bark?; knots
21A	Betula spp	15	-	2.8	85x85	-
21B	Quercus spp	22	11	2.7	140x135	bark; scar in outermost rings
22	Betula spp	24-25	-	2.5	150x140	bark; knots
23A	Betula spp	14	-	5.4	150x140	knots
23B	Betula spp	15	-	3.8	110x95	knots
24	Quercus spp	23	9	2.7	120x100	bark - felled winter
25	Quercus spp	12	12	5.0	120x110	bark - felled winter
26	Quercus spp	25	10	4.0	195x175	knots
27A	Quercus spp	13	13	2.4	55x55	bark -felled summer
27B	Quercus spp	51	21	1.0	120x120	-
28	Betula spp	25-30	-	2.7	160x140	knots
29	Quercus spp	29	18	3.0	150x145	bark - felled summer; scar in ring 26
30	Quercus spp	22	12	3.0	150x130	bark - felled winter; knots