

Plant remains from Pudding Mill Lane

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ENV/BOT/RPT/./17

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January 2017

Archaeobotany

Museum of London Archaeology

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Methodology

Nine environmental bulk samples, each of approximately 10 litres, were taken alongside geoarchaeological monoliths, from a section through alluvial deposits of the River Lea. Two of these samples, [12]{8} and [13]{9} came from the base of the alluvium, below the weirs, one, [11]{6}, from the overlying sandy river bed into which the weir posts and stakes were driven and one, and {7}, from the junction between [11] and [12]. A further five samples were taken from alluvial layers above the weir. The samples were processed by flotation, and the wet flots assessed.

While sample {9}, and those from above the weir, produced no or few plant remains three of the alluvial samples from below the weir contained reasonable assemblages of waterlogged plant macrofossils, and have been fully identified and analysed. Full taxa lists and abundances are shown in Table 1.

Results

Organic remains in sample [12]{8}, from the organic clay forming the base of the alluvium, were poorly preserved and, in many cases, broken. Much very soft, highly fragmented wood was present, along with root tissue and a smallish assemblage of waterlogged seeds. A majority of these were from herbaceous plants of wetland habitats, with seeds of fool's watercress (*Apium nodiflorum*), lesser spearwort (*Ranunculus flammula*), water pepper (*Persicaria hydropiper*), marsh marigold (*Caltha palustris*) and sedges (*Carex* spp.) all identified. These are all plants of shallow water or stream sides, often in places exposed to some seasonal drying (which could also account for the poor preservation). No fully aquatic species were identified, and no indications of brackish water were seen among the surviving plant remains. Occasional alder (*Alnus glutinosa*) catkins, willow (*Salix* sp.) buds and seeds of blackberry/raspberry (*Rubus fruticosus/idaeus*) and elder (*Sambucus nigra*), as well as the wood fragments, suggest trees and scrub, perhaps alder carr, close to the river. Very few seeds of dry-ground plants were found in this sample, though occasional examples from dandelion (*Taraxacum officinale*), buttercups (*Ranunculus acris/repens/bulbosus*) and probable flax (*cf. Linum* sp) suggest the presence of grassy places nearby.

Sample {7}, taken from the interface between [12] and the overlying sandy clay alluvium [11], contained an intermediate plant assemblage, both in size and composition, as might be expected. A wider and better-preserved range of plants was found here than in sample {8}, representing both wetland and dry ground species, though the former were considerably more numerous. As in sample {8} no fully aquatic plant species were seen, but a few fragments from the aquatic larval cases of C (Trichoptera) were found. Seeds of plants such as club-rush (*Schoenoplectus lacustris/tabernaem*), golden dock (*Rumex maritimus*), water-plantain (*Alisma* sp) and water pepper (*Persicaria hydropiper*) suggest a shallow water environment, near the river's edge, and again perhaps prone to some seasonal drying. Golden dock and grey club-rush (*Schoenoplectus tabernaemontani*) are both tolerant of brackish conditions (though the latter was not identified with certainty). Other species, including marsh marigold

(*Caltha palustris*), common meadow rue (*Thalictrum* cf. *flavum*) and ragged robin (*Lychnis flos-cuculi*) may have grown in slightly less wet conditions at the riverside, or in wet fens or meadows alongside.

Evidence for woody plants was limited in this sample to a few buds of willow (*Salix* sp.) and seeds of blackberry/raspberry (*Rubus fruticosus/idaeus*), though small wood fragments were reasonably abundant.

Seeds of dry-ground plants came mainly from plants of grassland and other open land, and included self-heal (*Prunella vulgaris*), sheep's sorrel (*Rumex acetosella*), vervain (*Verbena officinalis*), dandelion (*Taraxacum officinale*) and buttercups (*Ranunculus acris/repens/bulbosus*).

The largest and most diverse assemblage of plant remains came from [11]{6}, the alluvium into which the weir timbers were driven. The flot was made up mostly from wood fragments, some of which were large enough to be sectioned and identified, and which proved to be mostly of willow (*Salix* sp.), though a single piece of ash (*Fraxinus excelsior*) was also found. Many willow buds and some seed capsules were also found. Further evidence for woodland and/or scrub was found in the form of occasional seeds from rose (*Rosa* sp.), blackberry/raspberry (*Rubus fruticosus/idaeus*), elder (*Sambucus nigra*) and hop (*Humulus lupulus*).

Almost half of all the taxa represented in the sample were aquatic or wetland plants. Occasional seeds of pondweed (*Potamogeton* sp.) and horned pondweed (*Zannichellia palustris*), both of which grow submerged or floating in water, were found, but the majority of taxa were, as in the earlier samples, more characteristic of vegetation found at the water's edge or on wet ground prone to periodic flooding. These were mostly from the same species as those found in sample {7}. While horned pondweed and grey club-rush (*S. tabermontani*) are both tolerant of brackish conditions, the majority of the wetland plants found here are freshwater species. As in sample {7}, occasional fragments of caddis fly larval cases were seen, as was a very large assemblage of freshwater mollusc shells.

Seeds of dry-ground habitats included slightly more from disturbed-ground habitats, including waste and/or cultivated ground, than in earlier samples. One species, shepherd's needle (*Scandix pecten-veneris*) is particularly characteristic of arable fields, and a single charred grain of wheat (*Triticum* sp.) also indicates the presence of agricultural activities in the area.

Discussion

While the differences in preservation of organic material makes comparison between the samples difficult, it is possible to suggest some likely changes in the environment between the deposition of the alluvial layers [12] and [11]. There is some evidence for an increasingly wet environment. Poor preservation in sample {8}, combined with absence of aquatic species suggest a seasonally variable environment, either a shallow stream prone to partial drying in summer or deposits at the edge of a larger water body, while the more diverse assemblage of

wetland plants from sample {6} includes fully aquatic species whose roots must be constantly submerged in water.

Remains from willow (*Salix* sp.) and blackberry (*Rubus fruticosus/idaeus*) were found in all three samples, indicating the presence of these trees and shrubs along the river bank throughout the period of deposition, but there seems to have been some change in the remains of dry-ground plants, growing further from the river. These appeared to indicate mainly grassy habitats in the transition sample between [12] and [11] while disturbed ground habitats, probably including cultivated land, were also suggested in sample {6} from [11].

Table 1: Plant remains from Pudding Mill Lane

	context:		11	11/12	12
	sample:		6	7	8
		plant			
scientific name	common name	part			
charred remains					
<i>Triticum</i> sp.	wheat	-	1		
indeterminate	-	WD	+	+	+
uncharred remains					
<i>Caltha palustris</i> L.	marsh marigold	-	++	++	+
<i>Ranunculus acris/repens/bulbosus</i>	buttercups	-	+++	++	++
<i>Ranunculus flammula</i> L.	lesser spearwort	-			+
<i>Thalictrum</i> cf. <i>flavum</i>	common meadow rue	-		+	
cf. <i>Barbarea vulgaris</i>	yellow rocket	-	+		
<i>Silene</i> sp.	campion	-			+
<i>Lychnis flos-cuculi</i> L.	ragged robin	-		+	
<i>Stellaria media</i> (L.) Vill.	common chickweed	-		+	
<i>Chenopodium album</i> L.	fat hen	-	+		
<i>Atriplex</i> sp.	orache	-	+	+	
cf. <i>Linum</i> sp.	flax	-			+
<i>Filipendula ulmaria</i> (L.) Maxim.	meadow-sweet	-	+		
<i>Rubus fruticosus/idaeus</i>	blackberry/raspberry	-	+	+	+
<i>Rosa</i> sp.	rose	-	+		
<i>Anthriscus sylvestris</i> (L.) Hoffm.	cow parsley	-	+		
<i>Scandix pecten-veneris</i> L.	shepherd's needle	-	+		
<i>Oenanthe</i> sp.	dropwort	-	+	+	
<i>Apium nodiflorum</i> (L.) Lag.	fool's watercress	-	++	++	+
Apiaceae indet.	-	-	+		
<i>Polygonum aviculare</i> agg.	knotgrass	-	+	+	
<i>Persicaria hydropiper</i> (L.) Spach	water pepper	-	++	++	+
<i>Rumex acetosella</i> agg.	sheep's sorrel	-		+	
<i>Rumex maritimus</i> L.	golden dock	-		+	
<i>Rumex</i> spp.	docks	-	+++	+++	++
<i>Urtica dioica</i> L.	stinging nettle	-	+	+	
<i>Humulus lupulus</i> L.	hop	-	+		
<i>Alnus glutinosa</i> (L.) Gaertner	alder	CK			+
<i>Salix</i> sp.	willow	BD	+++	++	+

<i>Salix</i> sp.	willow	CP	+		
<i>Hyoscyamus niger</i> L.	henbane	-			+
<i>Solanum nigrum</i> L.	black nightshade	-	+		
<i>Verbena officinalis</i> L.	vervain	-		+	
<i>Mentha</i> sp.	mint	-	+		
<i>Prunella vulgaris</i> L.	self-heal	-		+	
<i>Sambucus nigra</i> L.	elder	-	+		++
<i>Senecio</i> sp.	ragwort	-	+	+	
<i>Cirsium</i> cf. <i>arvense</i>	creeping thistle	-	+	+	
<i>Sonchus asper</i> (L.) Hill	prickly sow-thistle	-	+	+	
<i>Taraxacum officinale</i> Weber	dandelion	-	+	+	+
<i>Alisma</i> sp.	water-plantain	-	++	+	
<i>Potamogeton</i> sp.	pondweed	-	+		
<i>Zannichellia palustris</i> L.	horned pond-weed	-	+		
<i>Sparganium erectum</i> L.	branched bur-reed	-	+		
<i>Schoenoplectus lacustris/tabernaem.</i>	club-rush	-	++	++	
<i>Carex</i> spp.	sedges	-	++	+	+
Poaceae indet.	grasses	-	+	+	
indeterminate	-	LF	++	+	
indeterminate	-	ST	+	+	
indeterminate	-	TH	+		+
indeterminate	-	WD	++++	+++	++++
indeterminate	-	RT		++	+++