Beacon Hill

Pollen assessment

Analyst:
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Client:
Beacon Hill Society

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Context

Two sediment samples have been analysed for pollen; they are TR-4003-01 and TR-4004-02.

Palaeoenvironmental assessment

TR-4003-01

Tree pollen contributes 25% of the total pollen (TP), principally *Alnus* (8%), *Ulmus* (6%), *Betula* (5%), *Quercus* (4%) and occasional grains of *Fraxinus*. Shrub pollen is dominated by *Corylus*-type (40% TP). Herbaceous pollen contributes 30% TP, dominated by Ericaceae undiff. with a few grains of Gramineae and the anthropogenic indicators *Plantago lanceolata* and *Rumex*. Spores account for 3% TP (*Polypodium*). There are no aquatic taxa present.

TR-4004-02

Tree pollen contributes 23% TP: *Ulmus* (10%), *Betula* (8%), *Fraxinus* (3%), *Quercus* (2%). Shrub pollen: dominated by *Corylus*-type (27%TP). Herbaceous pollen contributes 46% TP, dominated by Ericaceae undiff, with Gramineae (4%). Spores contribute 3% TP (*Polypodium*). There are no aquatic taxa present.

In TR-4003-01 deciduous woodland cover is nearby. The pollen spectra suggest that this comprised an oak-elm canopy, with hazel forming the understorey (or shrub) layer. *Betula* (birch), a light-demanding tree, may have occupied areas where the canopy was thinnest, or have been located at the margins of the woodland. The presence of *Alnus* (alder) is unusual given the site's location and suggests transport of pollen to the site from elsewhere via wind. There is little diversity of herbaceous pollen; Ericaceae pollen suggests open, well-drained ground nearby (the pollen perhaps blown to the site from higher parts of the Mendip plateau). Anthropogenic disturbance is suggested by *Plantago lanceolata* and *Rumex*.

In TR-4004-02 the structure of nearby woodland is a little different, with *Ulmus* (elm) comprising a larger part of the woodland canopy and *Quercus* (oak) declining. The *Corylus* shrub layer has also declined, and higher counts of *Betula* and *Fraxinus* relative to TR-4003-01 suggests that these changes allowed a greater amount of light to reach the floor. This appears to be supported by an increase in Gramineae and a decline in *Polypodium*, a fern of shaded and semi-shaded habitats. Persistence and perhaps expansion of open ground nearby is indicated by the increased abundance of Ericaceae.

Pollen preservation

In general, the pollen in both samples is in a very good state of preservation. Pollen grains are abundant and a count of 300 grains per sample was accomplished. Approximately 15% of the grains and spores were damaged, but this did not appear to be species-related. For example, *Corylus*-type, *Alnus* and *Betula* are particularly susceptible to corrosion (principally by microbial attack in a dry environment) yet (despite some corrosion of *Alnus* grains) there were abundant well preserved grains from these species (see Figure 1). Some thinning of Gramineae grains was apparent, probably from drying out; additionally some grains had been mechanically damaged (either broken or crumpled).

Recommendation

Full analysis could be undertaken on future samples from Beacon Hill. High-resolution sampling of a full sequence would be recommended to produce a more detailed

reconstruction of landscape change over time. There is no evidence of significant differential accumulation of resistant pollen types and the processes of deterioration do not appear to have advanced to the state where the integrity of the results would be compromised.

Dr W Woodland
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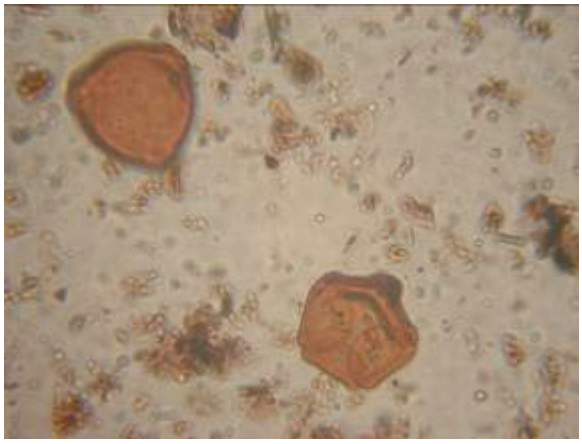
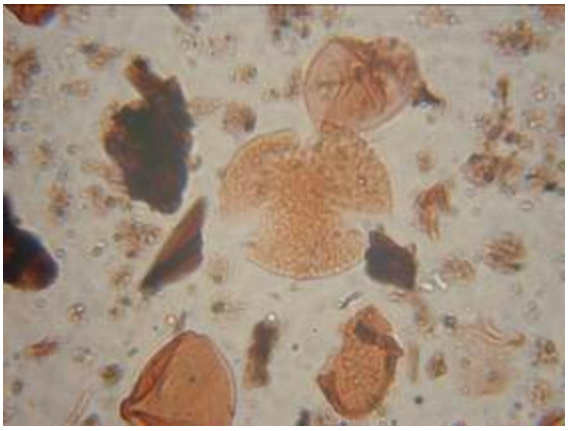
March 2008

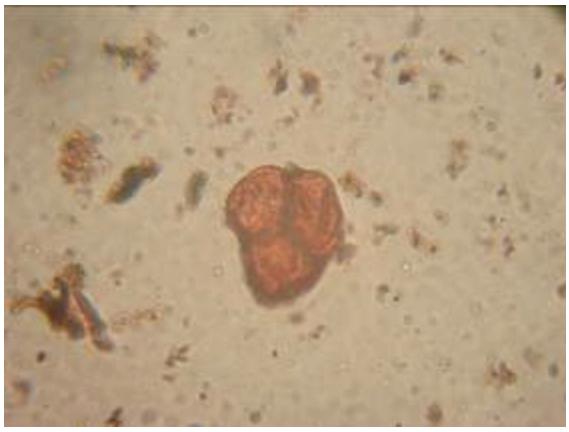
Figure 1: pollen grains for selected taxa recovered from Beacon Hill sediment sample TR-4003-01 (not to scale).



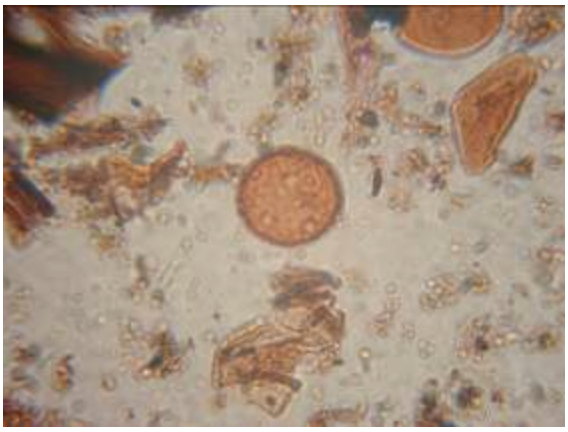
(a) left: *Corylus (hazel)*; right: *Alnus (alder)*



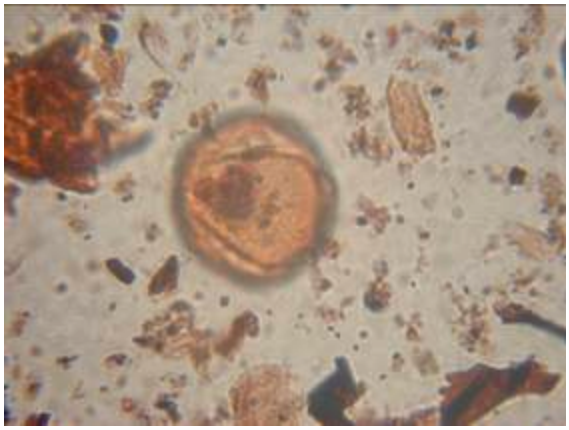
(b) centre: *Fraxinus* (ash)



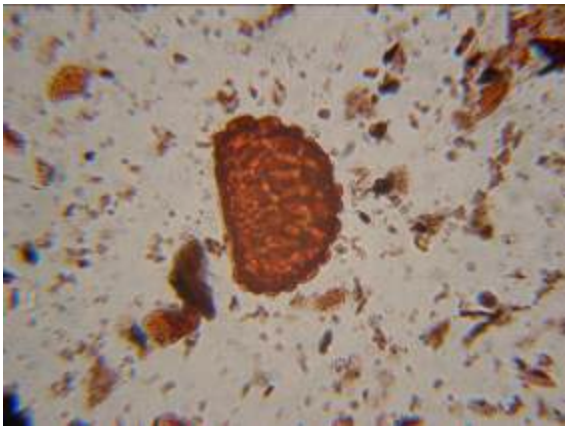
(c) Ericaceae (heather family)



(d) *Plantago lanceolata* (common plantain)



e*) Rumex* (dock)



(f) *Polypodium* (polypody fern)