When is a Pollen Type an Indicator of Human Presence ?

An Example from Hailuoto, Northern Finland

Abstract

Pollen analysis is a familiar tool for tracing the presence of man and his interaction with the natural environment. At high latitudes, however, this pollen evidence tends to be very slight and of a potentially ambiguous nature when compared with that from areas in lower latitudes. The paucity of evidence is usually due to the fact that man induced changes are small in areal extent compared with the abundance of natural or semi-natural vegetation, while the ambiguity of the evidence arises from the fact that many characteristic anthropogenic indicators simply do not grow at these latitudes. Because of this a somewhat different approach to the problem is required, one which utilises every available source of information, so that the fossil pollen evidence is supplemented by modern pollen and vegetation analyses, historical records, maps, photographs etc. The pollen indices thus established can then be used not only to interpret other comparable high latitude situations but also possibly to throw light on prehistoric situations in lower latitudes at times of sparce occupation of a boreal forest environment.

Four questions can be posed : (1) What type of pollen evidence is to be expected ? (2) Where in the landscape relative to the sampling site has the activity taken place ? (3) What is the density of the influence — one large centre or several small ones ? and (4) For how long did the activity continue ?

In answer to question 1, lists can be drawn up, on the basis of both direct observation at the present day and on historical records, of those plants associated with different human activities, primarily dwellings, trackways, agriculture or pasturing. Using these lists, pollen indices for each activity can be predicted. These can include the presence of individual or groups of indicator species, the percentage and/or influx limits of characteristic pollen assemblages, the disappearance or appearance of certain trees etc. which can be positively related to human presence.

Part of the answer to question 2 can be obtained from modern pollen evidence, by comparing the percentage and influx of the indicator pollen groups mentioned above (fig. 1) with (a) the percentage presence of each activity within

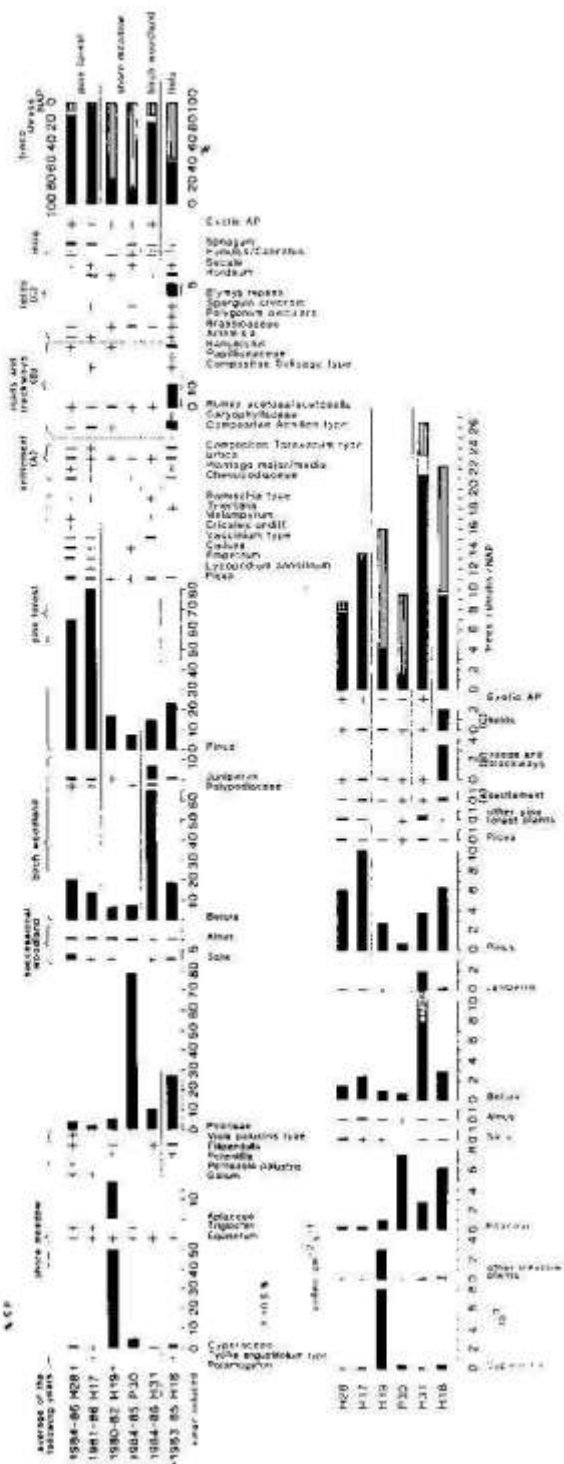

Fig. 1. Modern pollen percentage and influx values for different local vegetation communities on the island Hailuoto. The pollen taxa considered indicative of human activity are grouped into three categories A : settlement, B : roads and trackways and C : fields.

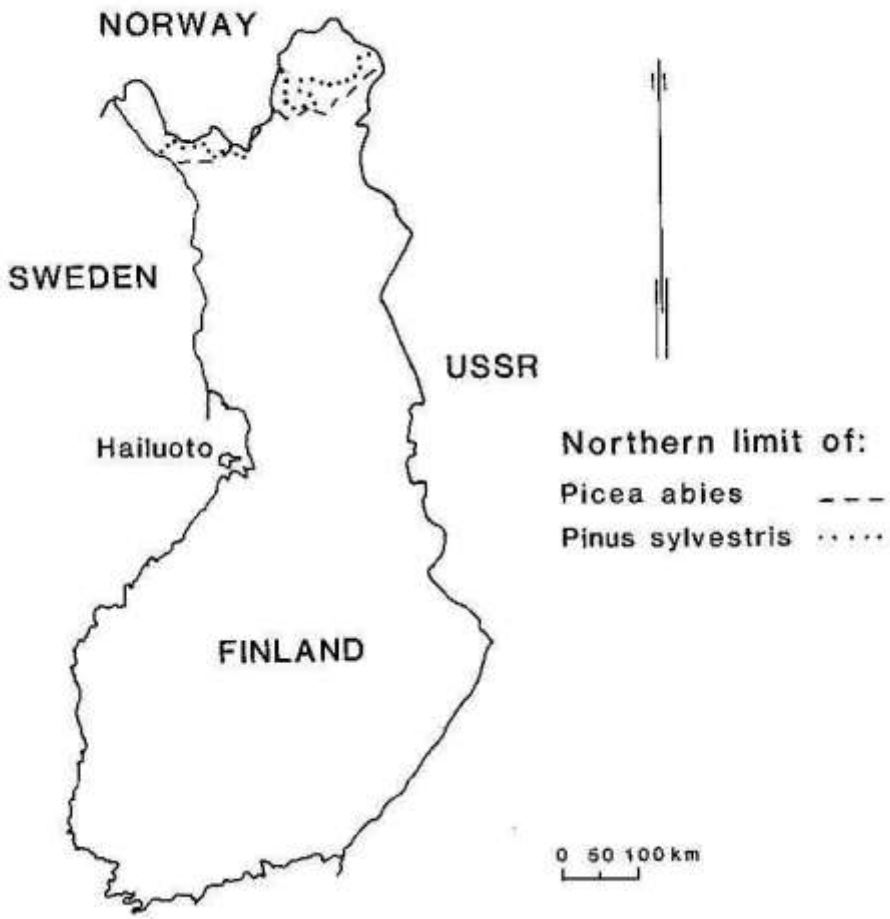

Fig. 2. Map of Finland showing location of the island, Hailuoto.

circles around the sampling site of 200, 400 and 600 m radius (Hicks, 1985) (b) the distance to the closest occurrence of each activity and (c) the nature of the intervening vegetation. This latter point is particularly significant since tall, dense herbaceous vegetation can form a very effective barrier to pollen transport.

Question 3 poses the greatest problems but certain levels of density can be arrived at by comparing the strength of the pollen signal with what is known of agriculture and settlement from historical sources and using this to extrapolate back to unknown periods.

The final aspect, question (4), is answered by means of the familiar independant dating techniques, ^{14}C, rates of land uplift, marker horizons of known age etc.

An example of one application of this type of approach is provided by an investigation of the island Hailuoto situated in the middle boreal zone near the head of the Gulf of Bothnia (fig. 2). Despite the sparceness of the pollen

evidence for the non-forest elements of the island's vegetation it has been possible, by means of the type of indices mentioned above, to trace the settlement of the island and the changing nature of its economic basis from the time of its first occupation in 12th century (Hicks, 1988). It has also been possible to distinguish differences in development for different parts of the settled area taking into account their situation relative to the ever changing coastline and the differential pollen dispersal possibilities related to the local vegetation communities and the closed or open nature of the forest.

This contribution is based on material collected in conjunction with a joint palynological/historical project « Hailuoto in the middle ages ».

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