Pre-Landnam Plantago lanceolata *in North-West Iceland*

J. D. Hansom og D. J. Briggs

Abstract

Recent finds of pre-Landnam *Plantago lanceolata* in sediment cores from North-west Iceland show that the plant was present well before the arrival of early settlers. This appears to be a fairly common trend in the western and northern islands of Europe since pre-settlement *P. lanceolata* is also known from Britain and Faroe as well as elsewhere in Iceland. It follows that, without substantial supporting evidence, great caution must be exercised in the use of this species as an indicator of human settlement.

Introduction

Plantago lanceolata often carries the label of being a so-called anthropogenic indicator (Berglund, 1985; Vorren, 1986) and its appearance in pollen cores is frequently recognised as heralding the arrival of humans. For example, Iversen (1941) demonstrated the significance of the pollen curve of this species as an indicator of the progress of the deforestation of Denmark by prehistoric peoples. Godwin (1944, 1948) also showed that the pollen curve of *P. lanceolata* ran closely parallel to the pollen curves typical of the creation of heathlands in East Anglia and of the variation in cultivation intensity from the Late Bronze Age to Late Roman times in England. The indicator value of *P. lanceolata* lies in its common association today with pasture and cultivation, its relative intolerance of competition from woody plants and its prolific production of windborne pollen (Godwin, 1975). More recently, the appearance of *P. lanceolata* at 2300BC and 390BC in the Faroe Islands has been used as evidence of prehistoric settlement (Johansen, 1989). This paper aims to call into question the use of *P. lanceolata* on its own, and in small quantities, as an indicator species in Britain, Iceland and the Faroes since it can be demonstrated to occur widely in pre-settlement Britain, considerably earlier than Landnam in Iceland and probably precedes humans in Faroe.

Pre-Landnam *P. lanceolata* in North-West Iceland

Recent geomorphological investigations in Vestfirdir, North-west Iceland (Fig. 1) have revealed deposits of undisturbed marine silts capped by freshwater peats which yield both pollen and microplankton in abundance (Hansom and Briggs, 1991). At Hvitahlid,

Fróðskaparrit 38.-39. bók (1989-90): 69-75

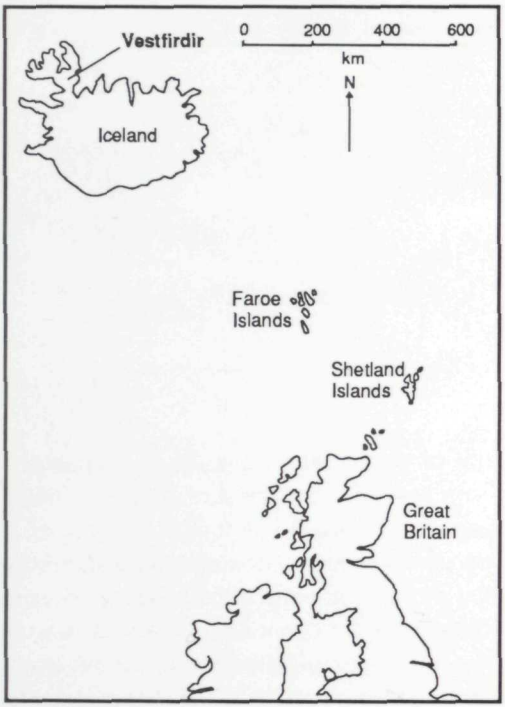

Fig. 1. Sites of pre-settlement *Plantago lanceolata* mentioned in the text.

on the northern shore of Bitrufjordur, a 3m deep stream section cut into marine silts of at least 8m thickness is truncated at its landward and upper surface by an erosional scarp which is itself draped by a sand and gravel deposit (Fig 2). This deposit contains a 10cm thick layer of peat which slopes seawards from 8.5m asl to about 6.5m asl. Statigraphically above the peat layer is a distinct beach ridge composed of course marine sands and gravels. Contained within this ridge is a 10cm thick layer of peat whose upper surface gives way to gravel and cobbles capped by soil. Incremental samples were taken through the entire section for sediment, pollen and microfaunal analysis. Samples 3-10 were taken from the main section whereas samples 1-2 came from the beach ridge which lies stratigraphically above, but seaward of, the main section (Fig 2). The pollen diagram from these samples suggests a sedge-grass tundra, with some dwarf willow and birch, juniper, heaths and heathers (Fig 3). The diagram can be divided into two: a basal assemblage with grasses around 20% of total pollen and sedges thereby reduced, and an upper assemblage heavily dominated by sedges and a considerable incidence of spores. Of significance here is the early occurrence of *P. lanceolata* (2% of total pollen) at 3.5m depth at the base of the diagram. It also occurs at two points above this at values of 1% and less than 1% total pollen. Examination of the samples for microplankton revealed a rich, decidedly boreal, fauna of which the basal section, corresponding to the marine silts, yielded a predominantly marine taxa derived almost exclusively from a shallow lagoonal or estuarine environment (Hansom and Briggs, 1991). The pollen and microplankton suggest a boreal aspect throughout with a shallow lagoonal marine environment up to 8m asl. Radiocarbon dating of both the upper and lower peats indicates that freshwater conditions at 8830 BP (Grn-15844) were temporarily halted at about 6910BP (Grn-15843) by a high energy marine event which deposited a beach ridge replete with marine taxa on top and in front of the eroded surface of the silts. It follows that the *P. lanceolata* pollen in the lower part of the curve pre-dates 8830 BP and therefore that the species was present in this part of Iceland considerably before the arrival of humans.

Exactly how long the species has been

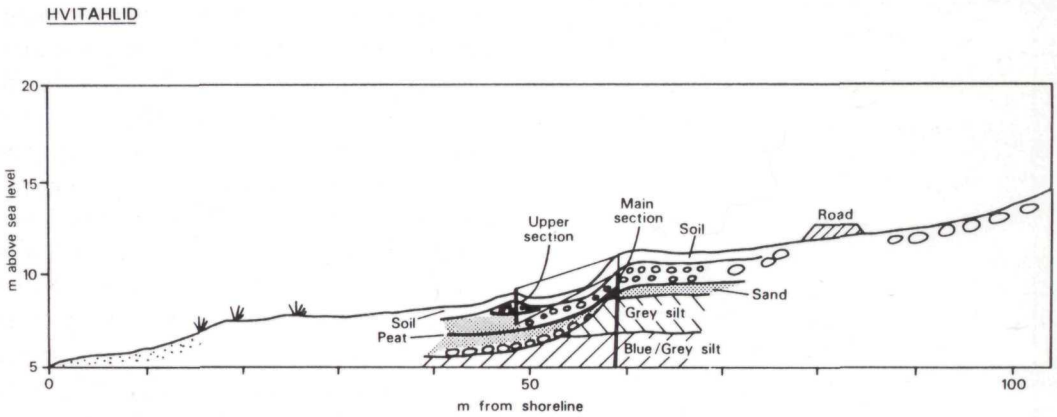

Fig. 2. The stream section at Htitahlid, Vestfirdir, Iceland. The upper section relates to a later beach ridge, the lower section dates to before 8830 BP and comprises undisturbed marine silts, containing quantities of *Plantago lanceolata*, capped by sands and peat.

present is, however, unresolved since several possibilities exist. *P. lanceolata* is found here in association with *Pinus, Myrica, Tilia, Impatiens* and *Pteridium*; not a particularly »Icelandic« pollen assemblage; Evidence from Greenland (Fredskild, 1985) would suggest that this reflects long distance transport from North America, although a European component may also be present. It may represent reworking from older, perhaps interglacial, deposits but this is unlikely. Another possibility is that it was present early in the Holocene in open ground situations, all but died out subsequently, and then was reintroduced in greater numbers at Landnam. Support for the early occurrence of *P. lanceolata* elsewhere in Iceland comes from pollen evidence from Lake Svinavatn where several of the anthropogenic indicator species including *P. lanceolata, Artemesia, Chenopodiaceae* and *Polygonum aviculare* occur below the Landnam tephra layer and hence are probably earlier that the Norse settlement (Hallsdottir, 1987). Interestingly, Hallsdottir (1987) records no real increase in the occurrence of post-Landnam *P. lanceolata* from any of her cores in spite of relatively abundant *Cerealia* pollen. Finally, it must be remembered that Iceland is on the periphery of the plants' present range: *P. lanceolata* today is confined to South Iceland around Eyjafjoll and in the north only in a few locations in soils close to geothermal heat (Kristinsson, 1987). It is therefore likely that in such locations the occurrence of the plant and its pollen production would be less than that expected elsewhere and so its transmission into the sedimentary record correspondingly reduced. Quantities of *P. lanceolata* pollen in such environments are always likely to be limited, whether or not introduced by humans.

Pre-Settlement *P. Lanceolata* in Britain and the Faroes

Pollen records in Britain demonstrate that *Plantago lanceolata* greatly increased in occurrence from the beginning of pollen zone VIIb onwards probably in association with increasing deforestation, pasture and culti-

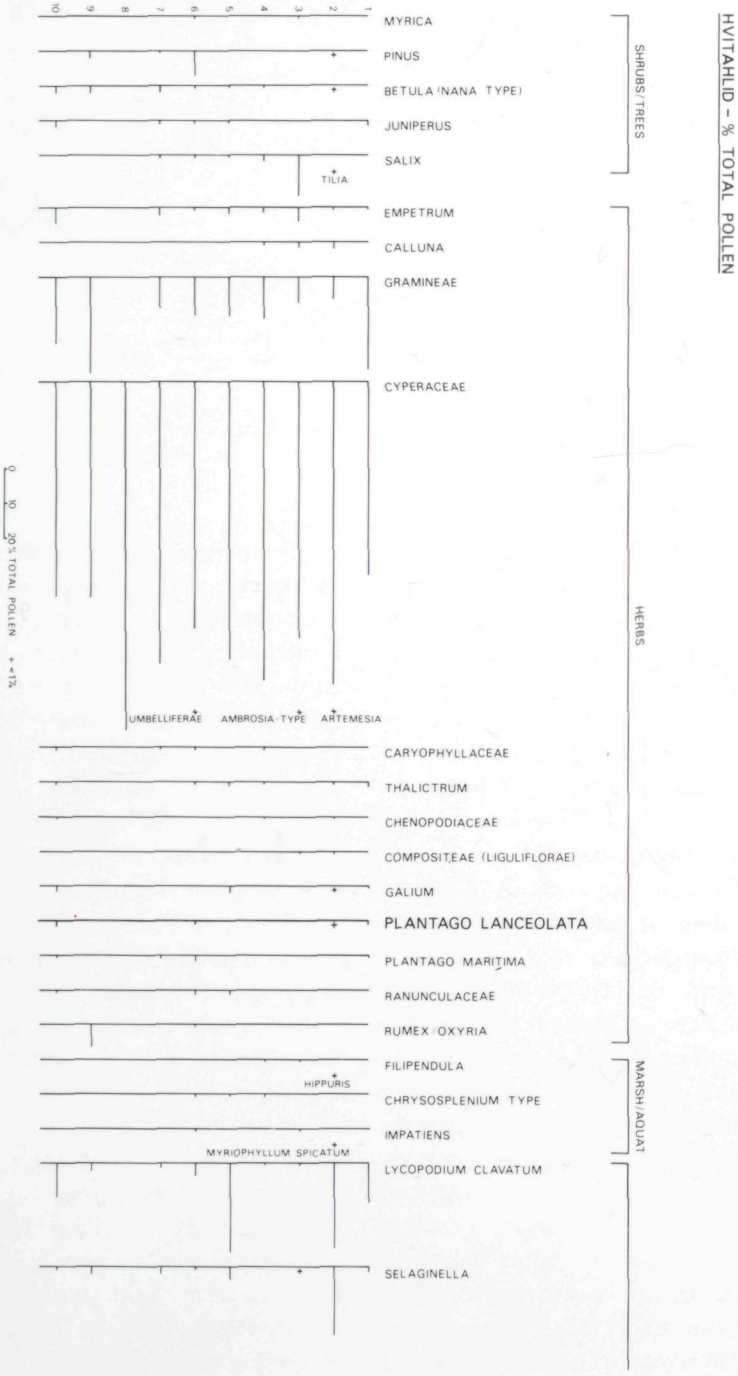
HVITAHLID - % TOTAL POLLEN
10 9 8 7 6 5 4 3 2 1
MYRICA
PINUS
BETULA (NANA TYPE)
JUNIPERUS
SALIX
TILIA
SHRUBS/TREES
EMPETRUM
CALLUNA
GRAMINEAE
CYPERACEAE
UMBELLIFERAE
AMBROSIA-TYPE
ARTEMESIA
CARYOPHYLLACEAE
THALICTRUM
CHENOPODIACEAE
COMPOSITEAE (LIGULIFLORAE)
GALIUM
PLANTAGO LANCEOLATA
PLANTAGO MARITIMA
RANUNCULACEAE
RUMEX/OXYRIA
HERBS
FILIPENDULA
HIPPURIS
CHRYSOSPLENIUM TYPE
IMPATIENS
MYRIOPHYLLUM SPICATUM
MARSH/AQUAT
LYCOPODIUM CLAVATUM
SELAGINELLA
0 10 20% TOTAL POLLEN + <1%

Fig. 3. Percentage total pollen and microplankton diagram from the stream section at Hvitahlid.

vation (Godwin, 1975). The evidence also suggests that the species was present in Britain well before that time since occurrences of Late-glacial *Plantago lanceolata* pollen are known from Nazeing in Essex, Flixton and Seamer in Yorkshire and in Stirlingshire and the Isle of Skye in Scotland amongst others. All of these pre-date the Neolithic invasions of the respective areas (Godwin, 1975). However, the few occurrences of *Plantago lanceolata* that occur pre-settlement in the Shetland Islands are explained as artifacts of long distance transport by Johansen (1987, 1985). On the basis of numerous radiocarbon dates *P. lanceolata* is thought to have reached the Faroe Islands about 2300BP and again at 390BC and is used as an indication of the prehistoric (and Pre-Viking) settlement of Faroe; many more records from ca. AD7000 awards are associated with the Viking settlement phase (Johansen, 1989).

Conclusion

It appears clear that instances of pre-settlement *P. lanceolata* pollen are known at sites from Britain to North-west Iceland although since the latter sites occur on the periphery of the plants' present day range, occurrence has always been, and still is, very restricted. In fact, whether *P. lanceolata* was actually growing near Hvitahlid in North-west Iceland in the early Holocene is an unresolved question. Therein lies the problem with the use of *P. lanceolata*, on its own, as an indicator of human settlement since small quantities of naturally-occurring pre-settlement pollen cast doubt upon its later association with human settlement. In Iceland, where pollen from *P. lanceolata* has never been plentiful, it is difficult to use the species as an indication of human activity. In the Faroe Islands, a more benign environment serves to blur the question of whether the background natural pollen count of *P. lanceolata* is sufficiently different from that associated with human activity to allow it to be used diagnostically, without recourse to alternative and supporting lines of evidence. For example there is generally a close association between settlement and the insect fauna co-introduced with livestock, yet any pre-Norse Landnam is currently unrecognisable in the fossil insect record from Faroe (Buckland, 1992). *Plantago lanceolata* probably arrived in these western extremities of Europe in the same manner as other early species, namely by rafting on sediment-laden ice floes travelling westwards from mainland Europe (Buckland et al, 1986) or, later, via carriage by birds. Either way the requirement that the species be associated solely with humans needs careful evaluation.

Acknowledgments

Pollen and microplankton analysis was expertly performed by Dr. C.O. Hunt.

Field support was provided by a grant from the University Sheffield Research Fund and we are grateful to the British Geomorphological Research Group for funding of the radiocarbon dates. The comments of Dr. J. Johansen, Margret Hallsdóttir, Poul Buckland and an anonymous referee are gratefully acknowledged.

References

Berglund, B.E.., 1986; Early agriculture in Scandinavia: Research problems related to pollen-analytical studies. *Norwegian Archaeological Review* 18, 77-90.

Buckland, P.C., Perry, D.W., Gislason, G.M. and Dugmore, A.J., 1986; The pre-Landnam fauna of Iceland: a palaeontological contribution. *Boreas* 15 173-184.

Buckland, P.C., 1992; Insects, Man and the earliest settlement of the Faroe Islands: a case not proven.

Fredskild, B 1985; Holocere pollen. Records from West Greenland, (in Andreass, J.T. ed.) *Qvætornary Environments, Eastern Anctec Carada, Batt in Bay and western Greenland,* Atten + Unwin, 643-631.

Fróðskaparrit, tm. Soc.Sic Faers, 36

Godwin, H.G., 1944; Age and origin of the 'Breckland' heaths of East Anglia, *Nature* 154 6.

Godwin, H.G., 1948; Studies of the Post-glacial History of British Vegetation, X Correlations between climate, forest composition, prehistoric agriculture and peat stratigraphy in Sub-Boreal and Sub-Atlantic peats of the Somerset levels, *Phil. Trans.* B233 275.

Godwin, H.G., 1975 *The History of the British Flora*, Cambridge University Press, 541pp.

Hallsdottir, M., 1987; Pollen analytical studies of human influence on vegetation in relation to the Landnam Tephra Layer in Southwest Iceland, *Lundqua thesis, vol 18, Dept. Quat. Geol. Lund University*, 45pp.

Hansom, J.D. and Briggs, D.J. 1991; Holocene Sea-level change in Vestfirdir, Iceland, (in Maizels, J. and Caseldine, C. eds.) *Environmental Change in Iceland: past and present*, Kluwer, 79-93.

Iversen, J., 1941; landnam i Danmarks Stenalder, En pollenanalytisk Undersogelse over det forste landsbrugs Indvirkning paa Vegetationsudvikliger, *Danm. Geol. Unders.*, R11, 66.

Johansen, J., 1978; The age of the introduction of *Plantago lanceolata* to the Shetland Islands, *Danm. Geol. Unders.*, Arbog 45-48.

Johansen, J., 1985; Studies in the vegetational history of the Faroe and Shetland Islands: *Ann. Societ. Scient. Faeroe*, Suppl. xi 117pp.

Johansen, J., 1989; *Plantago lanceolata* in the Faroe Islands and its significance as an indicator of prehistoric settlement, *Frodskaparrit, Ann. Societ. Scient. Faeroe*, 34-35, 68-75.

Kristinsson, H., 1987; *A guide to the Flowering Plants and Ferns of Iceland*, Orn. og Orlygur Publishers, Reykjavik.

Vorren, K.D., 1986; The impact of early agriculture on the vegetation of Northern Norway: A discussion of anthropogenic indicators in biostratigraphical data, (in Behre, K.E. (ed) *Anthropogenic indicators in pollen diagrams*, A.A. Balkema, 1-18.

J. D. Hansom
Department of Geography and Topographic Science
University of Glasgow
Glasgow G12 8QQ.

D. J. Briggs
Department of Geography
Huddersfield Polytechnic
Huddersfield.