
COIRE FEE

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Highlights

Pollen grains preserved in the sediments on the floor of Coire Fee provide a record, supported by radiocarbon dating, of Holocene vegetational history. This record is particularly significant for understanding the history of the montane species for which this area is of great botanical significance.

Introduction

The floor of Coire Fee (NO 250750) in Glen Doll, in Angus, contains an infilled basin at about 450 m OD located within a series of Loch Lomond Readvance moraines. The sediments in the basin provide a valuable record of Holocene vegetational history, particularly of the montane element in the British flora. This aspect has been investigated by Huntley (1976, 1979, 1981) and the glacial landforms by Sissons (1972a). The site is located within Caenlochan National Nature Reserve, an internationally important location for montane species (Ratcliffe, 1977).

Description

The glacial deposits at Coire Fee comprise an assemblage of hummocky moraines, lateral boulder moraines, fluted moraine, a medial moraine and recessional moraines all associated with a Loch Lomond Readvance glacier that flowed out from the corrie and became confluent with a glacier in Glen Doll (Sissons, 1972a). The southern and western sides of the basin are flanked by the boulder-strewn slopes below the cliffs of Coire Sharroch and Coire Fee. The cliffs today support a range of rare montane vegetation types and species (Ratcliffe, 1977). The basin contains at least 16 m of stiff minerogenic lake sediments, but the base of the deposits has not been proved (Huntley, 1981). The sediments are very complex, with interbedding and intermixture of muds, silts, and sands. "No convenient simplification is possible, except by regarding the whole core as one lithological unit within which there is irregular stratification and a slight trend towards lower levels of organic material towards the base" (Huntley, 1981, p. 196). Seven radiocarbon dates are available. The oldest, from the lowermost sediment samples, is 9460 ± 110 BP (Q-1424). The dates form an internally consistent series and permit the calculation of sediment accumulation rates and the dating, by interpolation, of changes in the pollen record. Four local pollen assemblage zones have been identified in the profile (Figure 9.14) (Huntley, 1979, 1981).

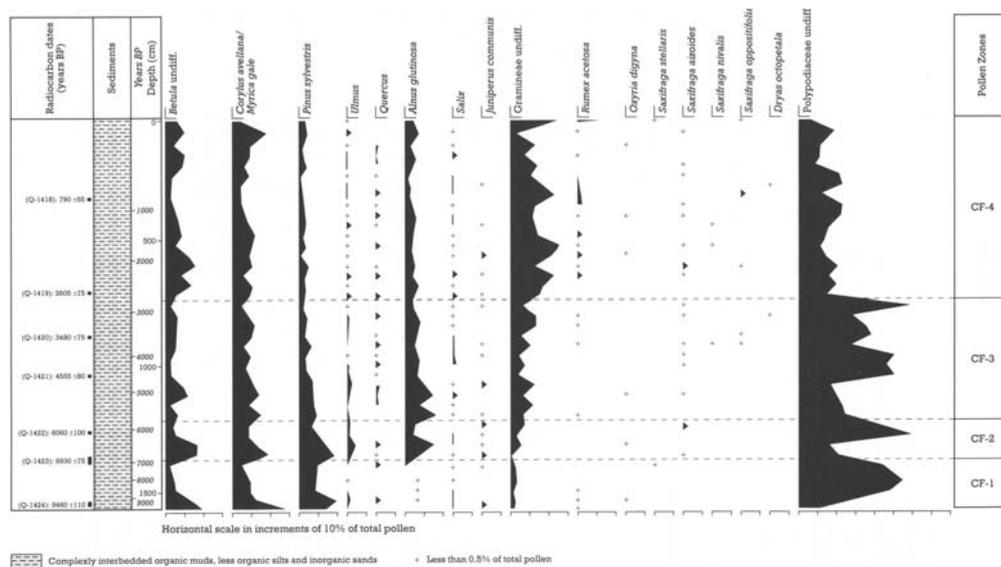


Figure 9.14: Coire Fee: relative pollen diagram showing selected taxa as percentage of total pollen (from Huntley, 1981).

Interpretation

Detailed pollen analyses and identification of many rare herbaceous types (Huntley, 1981) provide a basis for reconstructing the vegetational and floristic history of the site. The pollen record suggests that the area was never densely wooded, as tree and shrub pollen values rarely exceed 50% of total pollen. Scrub and small areas of woodland of *Betula*, *Corylus*, *Salix* and *Juniperus* occurred locally. *Pinus* was probably never an important component, and *Ulmus*, *Quercus* and *Alnus* were always rare. Areas of grassland, heathland, and fern-rich vegetation were widespread, especially from about 6000 BP. Tall herbs, today confined to ungrazed ledges, were once more widespread (for example *Filipendula*, *Rumex acetosa*, *Valeriana officinalis*, *Trollius europaeus*). Comparatively few changes occur in the pollen stratigraphy over the period 7000–5000 BP. Botanically, the most important feature is the occurrence in low, but significant amounts of pollen grains of many montane species scattered through much of the sequence – *Oxyria digyna*, *Saxifraga stellaris*, *S. aizoides*, *S. oppositifolia*, *S. nivalis*, *Dryas octopetala*, *Silene acaulis*, *Sedum rosea* – thereby providing clear support for Piggett and Walter's (1954) hypothesis of long-term persistence through the Holocene. Vegetationally the important feature is the recent (100–200 years) decrease in trees and the associated expansion of grasslands (Huntley, 1981; Birks, 1988). The pollen record suggests that, for much of the Holocene, Coire Fee was little affected by human activities. However, in the last two centuries areas of scrub and woodland decreased here and in nearby Caenlochan Glen, probably as a result of excessive grazing by sheep and deer causing lack of tree regeneration and associated woodland decline (Huntley, 1981). Mountain glens such as this appear to have been some of the last areas in Britain to have been affected by human impact (Birks, 1988).

Coire Fee is an important Holocene site because it provides unique data on the history of the montane flora in Scotland and on the ecological history of Caenlochan National Nature Reserve. The history of the montane element in the British flora (that is, arctic–alpine, alpine, arctic–subarctic species) has long been an important topic in historical plant geography and Quaternary botany (Godwin, 1975). Debate has centred on possible reasons why concentrations of montane species are restricted to a few areas in the Scottish Highlands (for example, Ben Lawers, Inchnadamph, Caenlochan, Glen Clova), northern England (for example Upper Teesdale), and North Wales (for example, Cwm Idwal). One hypothesis (Piggett and Walters, 1954) proposes that these areas provide not only suitable ecological conditions today (basic soils, steep slopes, cliffs, etc.), but that in the past they also provided open areas where dense forest never developed and where shade-intolerant, slow-growing herbs of low competitive ability could persist from the Lateglacial. Tests of this hypothesis are few; in Scotland, the pollen record at Coire Fee provides an important test. The evidence from the pollen contained in the sequence indicates the presence of significant numbers of montane species in the catchment area and hence supports the hypothesis that the occurrence of these

species in this (and other) areas is the result of their survival from Lateglacial times (see Morrone).

The site is also of interest for its assemblage of Loch Lomond Readvance moraines. Not only does it provide good representative examples of the range of moraine types formed in Scotland during the readvance, but also it has research potential for reconstructing the detailed pattern of ice wastage from the distribution of lateral, recessional and hummocky moraines (cf. the Cairngorms, Loch Skene, Coire a'Cheud-chnoic and the Cuillin).

Conclusions

The sediments at Coire Fee, and the pollen they contain, are important for the information they provide on vegetational development during the Holocene (the last 10,000 years) and, in particular, on the history of the montane species for which the area is noted today. The pollen record supports the argument that these species have survived from preceding Devensian Lateglacial times. Coire Fee is one of the few sites in Britain where survival of these species can be demonstrated.

Reference list

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