

**Stötter, J., Wastl, M., Kremenetski, C., Zelikson, E. and Caseldine, C. (1999):**  
Reconstruction of Holocene vegetation and tree-line history in Northern Iceland - evidence from Vesturárdalur, Tröllaskagi peninsula. *GSA's with Programs*, 31(7), A-75.

### **Abstract**

For palaeoclimatic reconstructions on the basis of vegetation history in Iceland, the upper limit of tree/shrub birch (*Betula pubescens*) has been proposed as an indicator of summer temperature.

Plant macrofossil and pollen analyses of sections and cores from the Vesturárdalur area, Tröllaskagi peninsula, Northern Iceland show that *Betula pubescens* grew up to an altitude between 450 m and 500 m a.s.l. during optimum climatic conditions in the Holocene. The pollen profile of core Vesturárdalur 2 at ca. 450 m a.s.l., covering the time from ca. 9000 radiocarbon years BP to present, thus represents the first continuous high-resolution record of vegetation development at the ecological upper limit of tree/shrub birch growth in Northern Iceland, where changes in thermal conditions have an immediate effect on the prevailing vegetation communities.

The reconstruction of the variations of tree/shrub birch at this site relies both on the palynological investigations and on the analysis of the birch macrofossils in the core. The time control is based on ten radiocarbon dates and a detailed tephrochronology, which also allows the direct comparison with other palaeoenvironmental and palaeoclimatic records both within Northern Iceland and on a North Atlantic scale.

The macrofossil investigations show that tree/shrub birch grew at an altitude close to its maximum Holocene distribution by at least ca. 7600 BP. Between ca. 6700 BP and ca. 6000 BP, a distinct maximum of *Betula pubescens*, with pollen accumulation rates reaching their highest values for the entire Holocene, indicates optimum thermal conditions. Around ca. 3300 BP there is a very pronounced minimum of both trees, shrubs and dwarf shrubs in the pollen profile. This can be correlated with evidence for increased geomorphological activity on slopes and a period of glacier advance in Northern Iceland.