P-1235

Palynological evidence of Picea omorika-type dominated forests in the classical interglacial site of the Hötting Breccia (Northern Calcareous Alps, Austria)

Roberta Pini[1], Cesare Ravazzi[1], Giulia Furlanetto[2], Lorena Garozzo[1], Michael Meyer[3], Diethard Sanders[3], Christoph Spötl [3], Andrea Tramelli[1]
[1]CNR-IDPA, Laboratory of Palynology and Palaeoecology, Milano, Italy. [2]University of Milano Bicocca, Dept. of Environmental and Earth Sciences, Milano, Italy. [3]University of Innsbruck, Institute of Geology, Innsbruck, Austria

Abstract

While deposits of the Last Glacial Maximum are widespread in the Alps, sediments pre-dating the Last Glacial Maximum are rare, mainly due to repeated overprint by glacial ice streams. An exception is the Hötting Breccia, a thick and complex succession of Pleistocene slope- and alluvial fan deposits preserved on the south-facing slope of the Nordkette range near Innsbruck (Austria). Since the 19th century, geologists and botanists have been fascinated by this site, famed for its spectacular record of macrofossil imprints including woody taxa extinct from the Alps today (e.g. leaf imprints identified as *Rhododendron ponticum var. sebinense* Sordelli).

We carried out a re-appraisal of this classical interglacial alpine site focussing on the fossiliferous lacustrine sediments in the basal part of the Hötting Breccia at Rossfall-Lahner and using the slabs that bear fossil plant imprints. All studied samples (calcilutites, calcisiltites, calcilithic arenites) contain fossil palynomorphs and, to our surprise, some of them provide palynological evidence of *Picea omorika*-type dominated forests, with minor contributions of *Picea abies*-type and by other evergreen and deciduous trees. The taxonomical assessment of fossil pollen of spruce was analyzed at the population level by comparing fossil pollen grain populations of 11 samples from the Hötting Breccia with 18 living populations of several W-European, Asian and Canadian spruces. We set up practical criteria for the specific diagnosis for light- and scanning electron microscope, and evaluated their functional and phylogenetic value. The recent discovery of functional traits in *Picea* pollen morphology allowed to define new pollen types of phylogenetic importance in Eurasian *Picea*.

The results support the presence of a spruce forest – at times dominated by Serbian spruce – in the upper montane to subalpine belt of the Northern Calcareous Alps during an interglacial younger than Marine Isotope Stage 22. Geochronological age constraints of the Rossfall-Lahner interval using optical dating techniques suggest that this site, whose flora has been traditionally considered as typical of the Riss-Würm interglacial, is early Middle Pleistocene in age, consistent with U-Th-dated (minimum) age constraints provided by vein-filling calcite.