



## **Structure and dynamics of ecosystems during the recent glaciations of the Quaternary in Medio-European and Mediterranean areas.**

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The ecological interpretation of pollen data from last glacial times in Western Europe remains difficult, probably because well preserved and continuous records are scarce and often analysed in low resolution (both chronologically and taxonomically). Moreover datings older than 40 ka are questionable. Another crucial point is the lack of modern ecosystems analogues, even at high latitude or high altitude. Lastly, the diversity of depositional environments (lacustrine, fluvial, eolian) of glacial pollen archives contribute to blur the ecological and climatic signal.

We present here the results of recent high time resolution analyses (pollen, geochemical markers) from the glacial section (OIS 4, 3 and 2) of the EC1 lacustrine sequence of Les Echets (foothill of the French Alps, alt. 267 m.). The biological and geochemical data testify to the strong climate instability during the last glaciation, marked with an alternance of 1) cold phases characterized by an arctic-boreal vegetation made of grasslands with Poaceae, Artemisia and various steppic herbs, 2) less cold phases, characterized by the return of open forests of taiga type, dominated by Pinus, Betula and Juniperus. The age model obtained from the glacial section of EC1 (Wolhfarth and al., 2008) enables to date the biological events recorded in this continental sequence, using a chronology independent of those acquired in marine or polar cores. The duration of these events is also estimated. This sketch needs of course to be discussed in the light of future new chronologies proposed for the same period from new continental lacustrine sequences.

The comparison of pollen records of Les Echets with other european glacial sequences shows that during the "warmest" periods of the last glaciation (OIS3, Middle Würm), deciduous and sclerophyllous forest persisted in the Mediterranean regions.