

General comments

This is a very challenging paper which illustrates the great potential of Chironomid studies and explores a key period of transition between glacial and interglacial. Its structure is good.

Remark 1 is on the age model. I know how it is difficult, almost impossible to acquire ^{14}C dates from sediments covering the last glaciation and the transition to LGI. The authors admit that the chronology of their sequence is not that robust but they claim that this chronology is supported by similar evidences from other sites (continental, marine, speleothems). According to the available data, this assumption and the correlation with HE1 remains still putative. The lack of a ^{14}C at the limit between zones 1 and 2 is thus quite frustrating.

Remark 2 on the transition between zones 1 and 2: the Chironomids diagram in fig. 3 is in agreement with an "abrupt" change at the beginning of a local expression of the "Pre-Bolling", but this evidence (expressed in the text) is less convincing on fig. 4 and 5 which suggest a progressive warming. How do the authors explain this discrepancy?

Remark 3 on the general understanding of the 18 000-14 500 interval. For me this transition is still difficult to understand and the authors could better underline the complexity of the question. For sure they insist on an altitudinal limit in the Alps: below 1000 m asl pollen data show faint evidences of reforestation and nothing is observed above. But when looking at several pollen sites recording the period before the "Bolling", dated or not, they show different evidences. For instance, at Monticchio, a never glaciated site, in a region well known as a refugial zone for trees, a "progressive warming" since 16.000 BP could have allowed an early forest expansion. It is not at all the case, and this period is marked by a maximum in *Juniperus* and *Artemisia* suggesting a dry phase. Still in Italy, at Lago dell'Accesa, a zone centered on 15 500 BP by tephrostratigraphy marked by a decline of *Juniperus* and a maximum of *Artemisia* "suggests more continental" climate. Thus the discussion is still open and fascinating and this paper constitutes an important contribution and an incentive for a deeper exploration of this period.

Technical corrections: On fig. 4 and 6 the legends identify image b as a and a as b!