

## ***Interactive comment on “Abrupt climate changes of the last deglaciation detected in a western Mediterranean forest record” by W. J. Fletcher et al.***

### **Anonymous Referee #1**

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Review comment of the paper "Abrupt climate changes of the last deglaciation in a western Mediterranean forest record" by Fletcher et al.

This paper is focussed on evidences of abrupt changes during the Last Deglaciation and Holocene in western Mediterranean through a comparison between vegetation change and pollen reconstruction data. High resolution Alboran Sea pollen data associated to their MAT quantitative reconstruction are compared with marine environmental changes and Ice core records. This paper is of good quality and presents highly reliable high resolution data on the MD 95-2043 marine core in west Mediterranean that generally support the conclusions and need to be published. Topics of the paper

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enter well in general themes of Climate of the past. Description of experiments is well explained and developed. Manuscript is well-written, well-structured and nice to read.

I have some specific comments on the manuscript:

1. Title of the manuscript has to be modified because the paper data cover more than the Last Deglaciation. Then authors have to mention all the time period studied in this new title (ex: last 20,000 yr or add the Holocene).

2. Authors present pollen results that are not new data (already published in Fletcher et al., 2008). However they propose a new interesting record with the TMF curve that gathers temperate and Mediterranean plants. They add the new MAT reconstruction to present temperature and precipitation estimates. The TMF curve cannot resume the consequences on vegetation of a precipitation decrease in precipitation and Temperate and Mediterranean forest decrease are associated with other changes in vegetation. They are not shown here. What are the differences between large decrease of H1 and YD climate episodes and Holocene events? I think that it will be good to present other pollen curve such as those of steppe vegetation in parallel to show that. This may explain that decreases in MAT parameters are very large during the first events (H1 and YD) and more slight during the onset of Holocene.

3. A remark about the Bølling/Allerød phase versus Greenland and other European records. Genty et al. have shown in 2006 that temperature vary in a different way from Bølling to Allerød in north and south Europe with a decreasing trend in North (as in ice core records) that change progressively in increasing one in South. Results of MD 95-2043 show a parallelism with ice cores. It is in opposition with the first scheme developed by Genty et al. (2006) with a clear North to South gradient. Authors have to discuss about that.

4. Make attention to the ages of events, some of them have not the same age in different parts of the paper.

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5. I am not completely convinced by the interpretation about the two situations of blocking and non-blocking situations and by the explanation of the rapid climate events. In fact, I am not sure that the same mechanisms drive deglacial dry events and Holocene forest declines. Perhaps I have not understood what authors want to express in the 5.2 paragraph and, especially, I do not see the aim of the last section of the 5.2 paragraph about the anomalies (that are not presented in any figure). Anomalies per comparison with what? I suppose it is versus present day values!! Authors have to detailed their demonstration and interpretation and precise their conclusions.

6. I think that authors are too excessive with their considerations about age reservoir in Mediterranean. It seems too much exaggerate to use palynology (with only TMF curve) as a marker to evaluate the changes in age reservoir in the Mediterranean Sea. Siani et al, in 2000 show that the reservoir age was about 280 yrs in the western Alboran Sea although it reaches 555 yrs in the eastern part of this basin. So the 400yr correction that correspond to the mean value of Mediterranean does not be corrected of 200 yr according to one site on the basis on one specific curve.

Technical corrections on figures In Figure 3, pollen events (forest decreases) are not reported and it is not easy to see clearly the correspondence between this figure plotted in depth and in figure 4 plotted in ages. It is not easy to read the MAT parameters curves in Figure 4 with only the error bars and the 3points smoothed curves. I do not know if the reason is the choice of colours or this presentation without the basic curve of each MAT parameter. Grey bars that marks forest decreases, are too light. Dashed line is too small to be well seen.

In conclusion, this manuscript is acceptable for publication in *Climate of the past* but I recommend minor corrections followed the amendments proposed above.

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Interactive comment on *Clim. Past Discuss.*, 5, 203, 2009.

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