

Review of Desprat et al., „Deglacial and Holocene vegetation and climatic changes at the southernmost tip of the Central Mediterranean from a direct land-sea correlation

This is an interesting paper that has clearly the potential to be published in „Climate of the Past“. The authors present a new pollen record from a marine core retrieved off Tunisia; the pollen-based climate information is then compared with previously published marine proxy data from the same core. Besides containing new palynological data, the paper yields insights into regional vegetation dynamics (although clarifications appear necessary – please see below) and potential climatic forcing mechanisms.

Without doubt, the authors have invested considerable time and effort in extracting as much information from their dataset as possible, both with regard to regional-scale vegetation development and supraregional climatic forcing mechanisms. On the down side, and as a result of these efforts, the paper has evolved into a piece of work that is most probably difficult to digest for a broader audience – in other words, my general impression is that the paper is currently much too long and that the writing should be improved. This already starts with the title of the paper, which strikes me as somewhat cumbersome (please see below). When revising their paper, the authors should (re-)consider what their key findings are, and then they should focus on convincingly bringing these key findings across to a broad audience. At the same time, they need to substantially shorten their paper when it comes to other, less important issues. Alternatively, the authors may want to consider the possibility to present their findings in two separate manuscripts. In any case, however, any revised version also will require a thorough linguistic overhaul through a native English speaker.

In the following, I provide a list of specific comments:

Title: I find the present title less than ideal with regard to its content and also too long/complex. First of all, I'm not truly happy with the term „deglacial“ here as the deglaciation (in the sense of melting ice sheets as they are also a topic of this paper) obviously extends all the way into the Holocene. Second, I remain unconvinced regarding the „southernmost tip of the Central Mediterranean“: The core does not come from the southernmost tip of the Central Mediterranean Sea (compare Fig. 1) – the Central Mediterranean Sea extends much further to the South, as do potential catchment areas for the pollen. Why not simply say that the study is based on a core from the Strait of Sicily (Central Mediterranean Sea)?

Figures: Although the figures are generally very clear and of good quality, I suggest to add an additional figure or to significantly modify Fig. 1 in order to enhance clarity. The manuscript makes reference to countless vegetation and climate archives the geographical positions of which are at least difficult to identify for the non-expert reader. How about presenting an additional map that indicates the positions of all sites from the Mediterranean region that are mentioned in the text? Perhaps this info can also be included in a redrawn version of Fig. 1.

Abstract, Line 5: introduce that MD04-2797CQ is actually a core!

Abstract, Line 16: „heaths as oak forest understorey“ – I don't understand, please rephrase.

Page 5691, Lines 7-10 („In addition, delayed forest expansion...“): This is not only the case in the southernmost areas of the Mediterranean region (as stated here), but also in the NE Mediterranean region (compare compilation by Kotthoff et al. 2008, The Holocene) and hence appears to be a widespread phenomenon in the Mediterranean region. I suggest to accordingly modify the statement made here.

Chapter 2 („Environmental setting and potential pollen source“): In my general comments, I have indicated that the manuscript needs to be condensed significantly (or subdivided into two stand-alone manuscripts). This chapter (and particularly its last paragraph) is a good example for why I feel the paper is presently too long: There is considerable information in the last paragraph that distracts from what is actually promised by the chapter caption: clarity on the source of the pollen. After all, the key question is not sufficiently answered/constrained: What is the source region of the pollen? The authors should look at (and provide evidence for) the distribution of wind directions during the spring and summer (i.e., during the main pollination seasons), perhaps similar to what is shown in Fig. 2 of Kotthoff et al. (2008, The Holocene). Altogether, this chapter can be substantially shortened/condensed.

Chapter 3 („Material and Methods“): How much sediment (volume, wet/dry weight) was processed per sample? This is important information missing. Is there any information on the TOC content of the sediments? If so, please specify.

Page 5696 („Material and Methods“), Line 3: The reference list contains 2 papers by Peyron (2012). Which one is meant here? Please specify.

Chapter 4.2 („Deglacial vegetation and climatic changes“), Line 15 („from southern Central Mediterranean“): Again, a pivotal issue is the catchment area. The authors need to invest much more efforts towards better constraining the pollen sources, although I admit that this is not an easy task (for that reason, one could also argue that core MD04-2797CQ is not ideally located when it comes to pollen-based studies). Depending on potential variations in atmospheric circulation across the interval investigated (which comprises strongly different climatic boundary conditions), the source areas may have even changed through time! Such efforts will greatly improve the punch of the paper (see also comment above).

Page 5698, Line 11: So where does this dust come from? This gives another piece of information on the potential source area of the pollen.

Page 5700, Lines 6-9 („Since tropical ocean...“): I'm not sure if I understand this sentence – please clarify/rephrase.

Page 5700, Line 10: vegetation and climate

Page 5702, Lines 27/28: How much closer to the core site? This can be easily estimated based on existing sea-level data and comparing them with the topography of the Strait of Sicily.

Page 5708, Line 6: „LIS“ – introduce abbreviation the first time you are using it.

Page 5708, Line 11: „remained narrow enough not to bring high humidity in the Mediterranean“ – What is his statement based on? Please clarify.

Page 5708, Line 27: „offshore flow“ – do you mean westward?

Page 5716, Line 8: Although ice-sheet extent obviously correlates with ice-sheet volume, it may be better to say „ice-sheet extent“ here.

Figure caption Fig. 1: The authors need to explain the abbreviations for the surface-water currents shown here.

Figure caption Fig. 2: What does the uncertainty envelope surrounding the main curve mean? Please explain.