

## ***Interactive comment on “Holocene vegetation and climate changes in central Mediterranean inferred from a high-resolution marine pollen record (Adriatic Sea)” by N. Combourieu-Nebout et al.***

### **Anonymous Referee #3**

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Holocene vegetation and climate changes in central Mediterranean inferred from a high-resolution marine pollen record (Adriatic Sea) by Combourieu-Nebout et al.

I think this is generally a good manuscript and important contribution to the understanding of Mediterranean ecosystem- and climate development during the Holocene. Palynological results from core MD90-917 have already been published by some of the authors in 1998, but I always hoped that these would be complemented with a better age model and higher resolution, and this is what this manuscript, together with interesting sedimentological results, delivers. There is no doubt from my side that these datasets should be published, and I also think that the different aspects of the discussion are worth publishing.

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However, it seems to me that parts of the text and the figures were done quite in a hurry, and there are some mistakes, which can be seen even when only quickly scanning the manuscript. E.g., like reviewers 1 and 2, I was a little puzzled that "AMS 13C ages" are mentioned at several places in the manuscript. The manuscript delivers four different wrong spellings of the name "Schmiedl" (related to Schmiedl et al. 2010). There are many mistakes in the figures and figure captions.

The English, while not overall bad, seems to contain several "frenchisms" (see below). Since I am not a native speaker myself, I cannot tell in some cases if the grammar is correct or not, but I would definitely suggest to have a native speaker carefully check the complete manuscript! The abstract is a particularly serious example. I will discuss this in detail below. The authors have already submitted a revised version of one figure, but there are several mistakes and editing problems in others. In the following, some issues are mentioned more detailed. I also mention misspellings where I found any. Some points concerning the content/interpretation have already been discussed by reviewers 1 and 2, I only mention additional points I found.

## Abstract

1971, 4: "pollen data... allows us" change to plural: "pollen data... allow us" The first paragraph of the abstract is something I would put in an introduction, but not in an abstract. But even for an introduction, the first statement would be too imprecise. Of course, the past can be key to the future, but this sentence sound like future ecology in the Mediterranean will only return to earlier states. Generally, the abstract does not give any precise information. Shifts are mentioned (from what to what?), changes in precipitation are mentioned, but not quantified - although absolute values are one of the strong points of this publication!

1971, 21: Is it really necessary to state that multi-proxy-approaches are a good thing? I suggest to completely rewrite the abstract. Leave out unnecessary points, and give more precise statements of what you have found!

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## 1 Introduction

The first two paragraphs appear quite complicated to me. I am sure it can be shortened significantly. Furthermore, some sentences are strange, e.g.:

1972, 11: "... past shifts in precipitation may help to envisage..." This sounds like the shifts themselves are doing interpretations. Analyses of past shifts may help...

1972, 18: "Its central location.... should be highly sensitive..." The location itself is certainly not sensitive, but the regional climate and the ecosystems.

Of course, everybody will understand what you are meaning, but still, you should avoid such sentences. There are more examples throughout the text.

The second half of the introduction is okay in my opinion.

## 2 Lithology and age model

The point with 13C vs 14C dates was already mentioned by the other reviewers.

### 3. 1 Climate and atmospheric circulation patterns

1974, 7: Why not "Azores High"?

## 5 Vegetation and climate for core MD 90-917

1981. 16 "Combourieu Nebout" instead of "Combourieu-Nebout" for the 2009 paper (see p1986, l2), although it is probably a wrong spelling. Occurs several times in the text.

1981, 16: The Younger Dryas is only indirectly mentioned in Kotthoff et al. (2008, QSR), but discussed in more detail in Kotthoff et al. 2011 (JQS) which is already mentioned in the references, and the vegetation during the YD in the Eastern Mediterranean is discussed in Kotthoff et al. (2008, The Holocene),

1982, 11-1983, 5: You seem to avoid discussing the second decrease in temperate forest pollen after the PBO (around 10 900 yr BP according to your age model). In-

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terestingly, such a second decrease can also be found in Italy (Monticchio, Allen et al. 2002, Quaternary International) and in the Aegean region (Kotthoff et al., 2008, The Holocene). Does the question mark in Fig. 4 imply that you are not sure about the correlation with the ice core data, or not sure about the data point? Compare also comments to section 6.1!

## 6.1 Temperature pattern

I may misunderstand something here. You write: 1985, 10: "The lowest MTCO in the record occurs during the Preboreal anomaly, before 12 000 cal yr BP." I can see two significant declines in the MTCO, one at around 13 000 yr BP, at the onset of the YD according to your own interpretation, (fits well with other records) and a second around 10 900 yr BP, which is related to the decline in temperate forest pollen at the same time (see comments to section 5!). The PBO, according to your Fig. 4, is at around 11 800 yr BP (I agree with you, in spite of the slightly too old age, that this may correlate with the decrease visible in NGRIP at 11 400 yr BP...). Your data does not reveal a significant decrease in the MTCO during the PBO, but in the MTWA. In the following: 1985, 24: "Temperature reconstructions indicate several cold..." you again do not refer to this event after the PBO. I think, however, this should be discussed in more detail. In your Fig. 3, it looks like the event around 10 900 (I assume, it can be correlated to events around 10 500 yr BP in other records) is not just reflected in one sample, but in three subsequent samples...

1986, 3, 5: "Schmiedl" instead of "Schmiel"

## 7 Conclusions

1990, 14-17: This sentence is confusing, avoid "provides... and provides", "provides the... signal... to... fluctuations" sounds strange.

The three points are fine, but, similarly to what I mentioned concerning the abstract, I wonder why you do not give some quantitative results here, e.g. concerning the

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precipitation peaks.

## References

I have not checked the references in detail, but since there are some references-related errors in the text and the figures, please check if there are more mistakes in the references!

1992. 23 "Combourieu Nebout" instead of "Combourieu-Nebout" (see above...)

1999, 11: "Schmiedl" instead of "Schmiel!"

## Tables

Table 1:

14C...

Table 2:

Is it on purpose that family names are written in italics?

"Q. ilex" instead of "Q. Ilex" (several times)

## Figures

The figures are generally well-organized, but there are so many mistakes...

Fig. 2:

Remove the points over the "i" in Cichorioideae and Asteroidea.

In my version, "Plantago" is bold instead of in italics, same with "Ephedra" and "Artemisia". Texts are overlapping in my version.

"YD" touches the line next to it.

Fig. 3:

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You mention "Pann, Twin, Tann, Tsum" in the text, in figure, I see PANN, MTCO, TANN, MTWA. What do you show, coldest month or winter?

"Corylus" and "Quercus" in italics, please.

Fig. 4:

The colour of the green and red text is not the same as that of the graph.

Are you sure the lines are of the same thickness?

Why are the numbers very close to the scales on the left, but far away on the right side?

Fig. 5:

Change Age (kyrs) to Age (yr)!

Remove the unnecessary "c"!

The colour of the green scale is not the same as that of the graph.

Fig. 6:

Compare to comments to section 6.1: I can generally not follow some of the arrows you show in this figure. They look rather arbitrary. Why not use something like a running average?

Fig. 7:

On the right side, Age (yr) almost touches the numbers.

It is "Schmiedl et al." (see above!). Replace both "Schmiedt" (figure) and "Schieldt" (caption)!

Fletcher et al. 2013 (instead of 2012 in the figure)

Fig. 8:

Consider using a real per-thousand symbol, not 0/00.

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Why upper case for " Precipitation", but lower case for "discharge"?

Final note

Just to state it again, I am convinced this has the potential to be a good publication. The new data fill a gap concerning marine palynomorph records. One additional thing I wondered: in Combourieu-Nebout et al. (1998), there were also dinocyst data - was the dinocyst dataset not improved the same way as pollen dataset? It would have been a helpful addition to this manuscript...

Some sections only need minor edits, but some sections, particularly the abstract and the first half of the introduction, need a careful revision. A more detailed discussion of particularly the PBO and early Holocene would be fine. The figures and references should be carefully checked for additional mistakes.

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9, C879–C885, 2013

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