

Interactive comment on “Holocene changes in African vegetation: tradeoff between climate and water availability” by C. Hély et al.

R. Cheddadi (Referee)

rachid.cheddadi@univ-montp2.fr

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Title: "Holocene changes in African vegetation: tradeoff between climate and water availability" by Hely, C. and Lézine AM

General comments This is a short paper that aims at evaluating the impact of the water availability, in the north western part of Africa during the Holocene on different vegetation types. The authors analyse statistically the spatial movements of many plant taxa that have colonized the now "hyper-arid Sahara" during a period known as the "African Humid Period" which was recorded during the Early Holocene. The manuscript is very clearly written which makes it accessible to a wider scientific community.

Specific comments In the introduction, at line 26, I suggest that the section that starts

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with "Due to the high ..." until the end of the introduction should be moved to section 2.2 in "Material & methods".

The authors have used an extensive dataset of 48 pollen records from the African Pollen DB and more than 1500 hydrological records. However, (as stated by the authors) almost half of the pollen records are "dated" with only one 14C date which obviously makes the spatial and temporal comparisons probably questionable to some extent. In order to make the reader aware of such potential bias, I suggest that (1) a column should be added to table A1 within which the authors may indicate the number of 14C dates available for each record and (2) if possible, use colors to show the time span covered by each pollen record instead of the black squares in fig 1A.

Concerning the hydrological data, I didn't find any information about the time spans covered by the records and eventually how they have been obtained. It would be difficult to include such detailed information in the manuscript but I would suggest as for fig 1A, using colors instead of black circles would provide a quick idea about the time span covered. Although it doesn't give any information about the reliability of each record.

In line 1 of section 2.2: how do the authors define the "ecological affinities"? Are they referring to observed modern associations or to common functional traits or something else?

In the same section, page 5 lines 12-14: Pollen and hydrological data were analyzed statistically using probability density functions (Kühl et al., 2002) on pollen/hydrological record presences". How do you do that? Kuhl et al. use plants distributions in a climatic space to build the pdfs. Moreover, the pollen and the hydrological sites have different locations. Therefore, have the authors interpolated the hydrological data onto the pollen sites? And if so what hydrological information was used? I am a bit confused with this sentence.

In section 3, page 6 line 26: "The timing of diversity change ..." I think that the word

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"diversity" is a bit confusing. In figure 3, the Y-axis represents the number of taxa and that should not be considered as "diversity". I understand that the authors are also looking at the taxa names but in this case (figure 3) they should definitely be using the "number of taxa" rather than "biodiversity".

Page 7, line 4: "... aridification of the most humid components ...". This is not correct. It is either an aridification of climate or an occurrence of "arid components".

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