

## ***Interactive comment on “South-western Africa vegetation responses to atmospheric and oceanic changes during the last climatic cycle” by D. H. Urrego et al.***

**C. Miller (Referee)**

c.s.miller@geo.uio.no

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Review for Climate of the Past Discussion

Urrego, D.H., Sanchez-Goni, M.F., Daniau, A.-L., Lechevrel, S., Hanquiez, V., South-western Africa vegetation responses to atmospheric and oceanic changes during the last climatic cycle.

In this paper the authors use both pollen (terrestrial) and d18O (marine) proxies from marine core MD96-2098, to reconstruct the climatic conditions in South Africa from 194 to 24 ka. Additionally, pollen analysis of surface samples was used to better understand the modern vegetation biomes - pollen rain relationship, facilitating the interpretation of

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the fossil record.

This paper is well structured, clear, and concise and was a pleasure to read. The conclusions and interpretations are relevant, interesting and justifiable from the data presented. I was particularly impressed with the figures and the attention to detail; all figures are clear and relevant to the presentation and the discussion of the results. I fully recommend this paper to be published in CP, and in my opinion, minimal corrections are needed.

In the following section I have highlighted my key comments and suggestions concerning the manuscript:

Page 346 Line 3 – add ka after 24 Line 14 – suggest, not suggested? Line 25 – you mention how the strength in the BUS is linked to arid conditions and the extent of the coastal Namib Desert. Do you mean that increased strength in the BUS results in increased aridity and an increase in the extent of the desert? Does the coastal desert expand inland? Maybe just make it a little clearer.

Page 347 Line 3 – significant yes, as well as incredibly complex. Line 5 – markers? Biomarkers? Do you mean proxies? Line 25 – Walker – capital letter

Page 348 Line 4 – not just today, and important in the face of future climate change scenarios surely? Maybe you could give an indication of what these scenarios suggest for southern Africa in the future? Is it likely here that the climate will become drier?

Page 351 Line 18 – is all the calcium carbonate from foraminifera?

Page 352 Line 1 – check tense – eliminated, and concentrated

Page 353 Line 3 – did you do the DCA analysis on all fossil pollen taxa, or those with their % above a certain threshold? Did you try doing the DCA of the individual samples (sample scores)? Any clustering in sample scores may indicate different vegetation compositions of the individual MISes? Line 28 – can you give an average sedimentation rate for the core? Line 28 – Can you show an age-depth model in the sup material?

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Page 354 Line 7 – how many taxa were identified in all the samples? How many unknowns? Line 13 – why would low primary productivity result in low pollen concentrations? Unclear.

Page 357 Line 21 – where is the DCA plot? Tell us that it is in the supplementary material. Can you give an indication of what DCA axis 1 actually represents?

Page 358 Line 5 – Does Fig. S2 have anything to do with core top samples? I think that is the complete pollen record? Is the link to the figure is in the wrong place?

Page 359 Line 15 – nss? Define.

Page 362 Line 11 – why is there an increase in both the amplitude and frequency of shifts between positive and negative DCA from 100 ka onwards? What does the DCA axis 1 actually represent? You mention possibly enhanced trade wind variability, but I guess if so then this is not related to orbital cyclicity (from 100 ka onwards the amplitude of the precessional variability decreases). Any idea why trade wind variability increased?

Figure comments: Fig 4 – not sure if a dashed line every 10 ka is necessary. It makes it difficult to see the stage boundaries. You don't need the references on the actual figure if you mention them in the figure caption. Add some arrows of interpretation on your data (like you have done with the 3 proxy records at the bottom of the figure). Sup. fig 1. caption – remove brackets around references Sup. fig. 2 – italicize sp. and genus where necessary.

To conclude, the paper represents a substantial contribution to scientific progress and is well within the scope of CP. The authors use a scientific approach and the methods applied are valid. This paper requires only a few very minor corrections, as indicated above, before publication.

Charlotte S. Miller, Oslo, 25th June 2015.

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