

Interactive comment on “Glacial-interglacial vegetation dynamics in south eastern Africa depend on sea surface temperature variations in the west Indian Ocean” by L. M. Dupont et al.

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This valuable contribution provides new evidence of Quaternary vegetation and climatic conditions of eastern Southern Africa derived from an offshore borehole near Maputo. It provides a background against which long-term anthropological developments in Southern Africa can be viewed. Apart from recording a long history of environmental change, it will potentially also be very useful in helping to elucidate uncertainties of other proxy records from the region (e.g., Wonderkrater, Tswaing, Sibudu Cave), which is, however, not dealt with in detail in the present paper. I am convinced the data presented here will in future be used very often in connection with Southern

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African Quaternary studies.

Apart from the positive aspects I found a few problems with interpretations: 2262, 13, 2275, 16, 17 and 2277, 24: A question arises from the abstract that while sea surface temperatures were colder so were the air temperatures (as mentioned in 2275, 16), but it is not clear why only the sea surface temperatures should be seen as the main cause for the long term vegetation cycle (also stated in the title). There is evidence that sea surface temperatures are associated with moisture conditions during the Holocene and at present, but can we extrapolate this over 300 000 years? I do not think the suggestion that lower precipitation is related to glacial vegetation is well founded over this time scale without other independent data to support it. Ericaceae do not seem to support lower precipitation because at present species on the eastern side of Southern Africa usually occur under relatively moist conditions. 2262, 16: An affinity of taxa like Ericaceae and Passerina to the Cape Flora (of the Fynbos Biome) is not questioned but this not relevant here because this biome is far away from the study site. Where “Fynbos” is mentioned it may be good to write it without a capital in order not to imply the Fynbos Biome of the Cape but rather fynbos as a general term for a vegetation type that occurs in high-lying cool, wet parts of the Grassland Biome (Mucina and Rutherford, 2006). In 2272, 9, the phrase “nowadays growing in the Cape” seems to be irrelevant. Although rare pollen grains from the Cape Fynbos Biome might arrive at the study site by long-distance wind transport, fynbos species in the Grassland Biome on the escarpment are much closer to the study site and produce high pollen loads (Scott, 1982 a&b; Scott, 1989). Further, some Passerina pollen could also represent Indian Ocean coastal dune vegetation (see Mucina and Rutherford, 2006; Neumann et al., 2008, 2010). 2263, 3: I am not sure that “all others” suggest that the southern Cape received summer rain; Bar-Matthews et al. (2010), yes, but Lee-Thorp and Beaumont’s work at Equus Cave is not from the Southern Cape, nor is Partridge’s study of Tswaing.

Other minor comments: 2262, 20-22: Can the winter-rain area be considered as sub-tropical? Is it not something in between the sub-tropics and temperate region while the

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summer rain area in South Africa is actually subtropical? 2263, 11: delete" heavily" 2264, 4: Is the Inter Tropical Convergence Zone is not a relatively wide phenomenon so that its influence can therefore be much further south than where the line where air masses converge is usually mapped? 2264, 16: Drakensberg 2255, 9: I am not sure why discussion of conditions on the southern coast is relevant here. This could be deleted. 2272, 16: Tribulus occurs as pioneer all over Southern Africa and should not be seen as coastal vegetation. Maybe it is more closely associated with the halophyte group than coastal vegetation even though it is no halophyte. 2272, 29: When? 2276, 4: endmember (lower case) 2276, 9: Meaning not clear, at least not to those not experienced in these techniques. 2277, 2: Move the word "depends" further down the sentence. 2277, 16: The phrase "complete climatic cycles" could be more specific, e.g., 300 ka or three orbital or glacial/interglacial cycles? Fig. 1: Tswaing could be shifted slightly northward not to lie in the Highveld. Fig. 2: Forest trees could be "Forest trees minus Podocarpus" or just "Other forest trees". Fig. 7: Spelling of coherency.

References used here but not in ms: Mucina L., Rutherford M.C. 2006. The vegetation of South Africa, Lesotho and Swaziland. *Strelitzia* 19. South African National Biodiversity Institute, Pretoria. Neumann, F., Stager, C., Scott, L., Venter, H.J.T., Weyhenmeyer, C. 2008. Holocene vegetation and climate records from Lake Sibaya, KwaZulu-Natal (South Africa). *Review of Palaeobotany and Palynology* 152, 113–128. Neumann, F., Scott, L., Bousman, C.B., van As, L. 2010. A Holocene pollen sequence and vegetation changes at Lake Eteza, KwaZulu-Natal (South Africa). *Review of Palaeobotany and Palynology* 162, 39-53. Scott, L. 1989. Late Quaternary vegetation history and climatic change in the eastern Orange Free State, South Africa. *S A J Botany* 55, 107-116.

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