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Biogeosciences Discussions

Interactive comment on "Stratigraphy and paleoenvironments of the early to middle Holocene Chipalamawamba Beds (Malawi Basin, Africa)" *by* B. Van Bocxlaer et al.

Anonymous Referee #3

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This paper presents a very thorough description of a newly recognized and established stratigraphic unit of Holocene age representing highstand deposits of Lake Malawi. The authors present exemplary detailed descriptions of the lithostratigraphy and have evidently made great efforts to accurately date the unconformity bound units that they recognize – notwithstanding the rapid lateral facies changes expected in such nearshore deposits. The basis of the correlations established is also fully detailed and the facies interpretations – though less detailed – appear to be sound.

Although the Chipalamawamba Beds is a thin and only locally outcropping unit it description is of major importance for the following reasons; 1) it represents precisely

dated highstand deposits of Lake Malawi that were deposited when lake levels were very similar to slightly higher than today 2) this represents additional, more precise, documentation of lake levels over the past ten thousand years than previously obtained 3) the deposits contain temporally rapidly deposited shell beds that can be precisely dated 4) the molluscs comprising these shell beds include taxa that are suspected to show rapid morphological evolutionary change (e.g. Melanoides) and these subfossils may provide significant data for establishing evolutionary dynamics of "young" species and taxa in the Malawi Basin.

It is this promise of providing the first paleontological perspectives on evolutionary rates in Lake Malawi that makes this "data paper" an essential and indispensible background for van Boxclaers very promising and continuing research program. It is of very great significance in indeed narrowing the considerable epistemological gap in evolutionary studies as mentioned in the final paragraph. Furthermore nearshore deposits of rift lakes have often been discounted for time series analysis because of their incompleteness. The present contribution shows that this need not necessarily be the case.

Comments I have only a few substantive comments to make though I offer minor comments and corrections to the appended MS. The MS is generally very well written and fulfils almost all of the 15 refereeing criteria. I think that some images of the dominant malacofaunal elements (e.g. Melanoides morphospecies) mentioned (pp. 5804-5) would be very useful. I also think that a photographic image of the exposures would be very instructive. I may have missed it but in discussing lake levels (pp. 5811-12) I think the authors have neglected to mention Malawi's current high stand water level. A statement and reference should be given. The late Quaternary transgressions recorded by the authors perhaps should be placed in better context given the massive changes in lake depth recorded in older sediments. Is there any data about what intervening low stand lake levels might have been to put the amplitude of these presumed transgressve-regressive cycles into context? A clarification on whether other Late Quaternary high stand deposits are preserved around Malawi or whether

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these might be the only ones described to date would be useful. Finally (p. 5813), there is just one section in a very thoughtful and carefully written paper that requires serious attention and re-writing. That is the statement (bold text added) that "the extant mollusc communities from Lake Malawi consists of species that descended directly from the fossil lineages, but not necessarily from the exact populations preserved at C. 'Ancestry' is an exceedingly thorny issue in palaeontology and I believe most mainstream macropaleontologists would regard its demonstration in this sense as impossible – as for inferring their ancestry as lying within the exact populations – this I believe can only be a fantasy, especially given Genner et al.'s (2007) inference of close relationship of Malawian and non-Malawian taxa.

Please also note the supplement to this comment:
http://www.biogeosciences-discuss.net/9/C2900/2012/bgd-9-C2900-2012-supplement.pdf

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Interactive comment on Biogeosciences Discuss., 9, 5793, 2012.