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Biogeosciences
Discussions

# *Interactive comment on* "Influence of changing carbonate chemistry on morphology and weight of coccoliths formed by *Emiliania huxleyi*" *by* L. T. Bach et al.

**Anonymous Referee #2**

Received and published: 8 June 2012

I am sending my review for the manuscript entitled "Influence of changing carbonate chemistry on morphology and weight of coccoliths formed by Emiliania huxleyi" by Bach et al. submitted to the Biogeoscience.

General Comments. The authors studied fine morphological and morphometric variation of coccoliths of E. huxleyi in response to change in carbonate chemistry parameters in laboratory culture experiments, and discussed the parameters that induce malformation of coccoliths and variation of coccolith size. The results obtained from this study are useful for interpretation of morphological variation of natural E.huxleyi population, and for discussion of effect of ocean acificifation on E. huxleyi population in



future. I believe this manuscript is of interest to the readers of Biogeosciences. I have minor suggestions as below;

Suggestions.

Page 5851, Lines 5-7; Raffi et al. (2006) reported the first appearance of Emiliania huxleyi at 291 ka, and crossover of G. carribeanica and E. huxleyi (onset of E. huxleyi acme) at 82-63 ka (Raffi, I. et al., 2006. A review of calcareous nannofossil astrobiochronology encompassing the past 25 million years. Quaternary Science Reviews, 25: 3113-3137).

Page 5851, Lines 5-7; As authors said, currently it is usually considered that E. huxleyi evolved from G. oceanica since E. huxleyi and G. oceanica are identical in SSU rDNA sequences, and G. oceanica have longer fossil record than E. huxleyi. However, it is important to keep in mind that there is a possibility that E. huxleyi separated from other members of Gephyrocpasa (e.g., G. mullerae, G. ericsonii, G. ornate). Currently there is no genetic data for other members of Gephyrocapsa , and it is difficult to discuss about direct ancestor of E. huxleyi.

Page 5852, Line 10; Please provide information of origin (sampling locality, date) and morphotype of the strain PML B92/11.

Page 5852, Line 14:Please provide information of temperature of origin of the strain B92/11. Since the lines 13-14 of page 5870 says 'It is likely that coccolithophores are adapted to the mean temperature of their natural habitat (Buitenhuis et al., 2008)', information of temperature of origin of the strain B92/11 would be useful for interpretation of the results of this experiments. Mean temperature data can be obtained from World Ocean Atlas 2005/2009 website by NOAA for free.

Page 5857; How many coccoliths per sample were measured under the SEM?

Page 5858, Line 28; I think your method is also useful for E. huxleyi var. corona.

Page 5861, Line 22-23; I think Fig 5 need to be referred for this sentence.

Page 5862, Lines 2-4; Please refer the paper that showed DIC and fCO2 range in the last 270 (or 290) kyr if available.

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Interactive comment on Biogeosciences Discuss., 9, 5849, 2012.