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Biogeosciences
Discussions

# *Interactive comment on* "The effect of salinity on the biogeochemistry of the coccolithophores with implications for coccolith-based isotopic proxies" *by* Michaël Hermoso and Marceau Lecasble

**L.J. de Nooijer (Referee)**

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Review Hermoso and Lecasble (BG-2018-357)

Dear editor,

After careful assessment of the manuscript of Hermoso and Lecasble on the effect of salinity on coccolithophore calcite chemistry, I recommend publication of minor revisions. Below, I listed some minor comments that I hope will further improve the text. I have only one serious issue with this work: the statistical basis for the regressions is lacking. There is no explanation as why the authors chose second-order polynomal



fits or to what extent they fit the data better than linear functions. The authors often refer to '(in)significant' trends, but it remains unclear how this is determined. rˆ2 values are themselves no indication of significance, as the authors suggest. This needs to be addressed in the revised version of their manuscript.

SIncerely,

Lennart de Nooijer

Methods

page 2, line 26/27: evaporation of seawater by sub-boiling to a salinity of ∼40 does not result in precipitation of salts. Preparing media by evaporation, however, also leads to differences in for example, total inorganic carbon concentrations, which might lead to differences in calcification. Perhaps the authors can use this as an alternative reason for preparing the culture media 'de novo'.

Which brings me to the question whether the carbonate chemistry (pH, [DIC], TA) of the water was determined/ monitored during the culturing experiment.

page 3, line 14-17: this can be omitted since it has no further relevance for this manuscript. Since this section will then become a bit short, it may better be combined with the previous or next one.

page 4, line 7: should be 'days'. I think in equation (1), the 'number of days between d and d-1' can be replace by 'n'.

Results

page 6, line 3: I don't understand the 'sensibility' in this sentence.

page 7, line 13: please avoid 'lighter', but instead use 'more depleted'. See also elsewhere.

page 7, line 15: please rephrase 'well-behaved'.

page 7, line 22: use ‘equilibrium values’ instead of ‘inorganic conditions’.

Discussion

page 7, line 31/32 and later in the discsussion: salinity has no unit. Not even per mille.

page 9, line 4: but isn’t the availability of CO2 not also determined by the activity of the coccolithophores? E.g. by photosynthesis. Moreover, CO2 may not be the preferred inorganic carbon species used for calcification (but maybe HCO3-), so I fail to see the logic of this argument.

page 11, line 10 and elsewhere: please italicize the ‘p’ in ‘pCO2’.

Figures

I don’t see the added value of figure 1. The spatial resolution is too coarse to see the sal/ del-18O of the water at the sampling locations. Otherwise, these maps show known global distributions in sal and del-18O and including them here therefore seems superfluous to me.

Figure 3, x-axis title and caption: salinity is unitless, so please remove the ‘%’. I think the upper x-axis title can also be removed. I find the r^2 values not very useful: they are by themselves not indicative of a significant correlation.

Figure 4: same as for figure 3. Please remove the trendline for E. hux, morphotype B: a trendline usually suggests a (significant) trend, which there is not in this case.

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