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Biogeosciences Discussions

Interactive comment on "Environmental drivers of coccolithophore abundance and calcification across Drake Passage (Southern Ocean)" *by* Anastasia Charalampopoulou et al.

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The present study by Charalampopoulou et al. addresses the composition and structure of coccolithophore communities and calcite production across Drake Passage (Southern Ocean), regarding also primary production, chlorophyll-a, nutrient concentration, temperature, salinity, irradiance and carbonate chemistry parameters. The manuscript is well written and adds an interesting contribution to the ecology of coccolithophores at high latitudes in a marked environmental N-S gradient. I consider that this manuscript is novel and addresses compelling scientific questions within the scope of Biogeosciences.

Specific comments:

L. 44: What about morphotype C described in Young et al. (2003)?

L. 97: Would it be possible to add other references here on top of Winter et al. (2014)?

L. 123: Section 2.2 Study area should go before section 2.1 Sampling.

L. 117. Is it possible to know at which depths (0-100m) the samples were retrieved? In L. 139 you wrote "up to 5 CTD depths over the upper 100m", but that is the only information provided.

L. 135-138. Not very clear, be more specific.

L. 153: I think that the cocospheres and coccoliths were identified not only to species level, since morphotypes were also separated.

L. 166: >99%, on average?

L. 170. Delete "and Poulton et al. (2011)" since they followed Young et al (2003) in their paper.

L. 171. "...and central area open or with a thin plate". Based on the morphological study of culture strains by SEM, Hagino et al. (2011) suggested to separate coccoliths with an open central area as Type O from existing morphotypes B, B/ C, and C, characterized by coccoliths with a solid plate in the central area. I wonder why the authors did not separate morphotype O from B/C considering that Type O is extensively distributed in the Southern Ocean (e.g., Hagino et al., 2011; Malinverno et al., 2015).

L. 322: If you mention Pappomonas spp. (L. 324) and Papposphaera spp. (L. 325) you should use "coccolithophore taxa" instead of "coccolithophore species".

L. 322: were identified as coccospheres? or as detached coccoliths? Specify.

L. 326: (Charalampopoulou, 2011). I do not think you need to cite it when she is the first author of this manuscript.

L. 326: "all the way across Drake Passage" might be misleading when looking at Fig.

4.

L. 384-385: Since the section 3.4 refers to morphometric measurements performed on Emiliania huxleyi specimens (see L. 165, section 2.4), you should specify that there, in section 3.4 (e. g. using “Emiliania huxleyi placolith size” instead of just “coccolith size”).

L. 400: I could not find Fig. 7!

L. 410 and L. 422: You did not talk about diversity before. I would suggest adding something about diversity in section 3.2.

L. 430: It would be worthwhile to consider Malinverno et al. (2015) and Saavedra-Pellitero et al. (2014) here and/or in L. 55-57.

L. 619: Make clear that this refers to coccolithophore communities in the Iceland Basin/North Hemisphere.

L. 970, 980, 985 and 990: I suggest plotting both transects N-S in Figures 2, 4, 5 and 6 instead of N-S-N. In that way it will be easier for the reader to compare Transect 1 and 2.

Technical corrections:

L. 342: (0.5-1.8 cells mL-1)

L. 347: (<0.01 $\times$ 103 coccoliths-1 mL-1)

L. 374: (0.4 cells mL-1)

L. 497: Winter et al.

L 708: Baumann, K.-H.

L. 762: 257 pp.

L. 791: 401 pp.

L 830: Whitworth III, T.

L 870: Baumann, K.-H.

L. 880: 327 pp.

L 887: pp. 75-97

L 896: Whitworth III, T.

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