

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:

C1

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- 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 coccospheres 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.

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4.

L. 384-385: Since the section 3.4 refers to morphometric measurements performed on *Emiliana huxleyi* specimens (see L. 165, section 2.4), you should specify that there, in section 3.4 (e. g. using “*Emiliana 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 × 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.

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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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