

Interactive comment on “Vanishing coccolith vital effects with alleviated CO₂ limitation” by M. Hermoso et al.

M. Hermoso et al.

michael.hermoso@earth.ox.ac.uk

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Although a fundamental conceptual difference on the existence or not of a “dedicated” route of HCO₃⁻ uptake from the extracellular environment for calcification is clearly apparent between Referees 1 and 2 and ourselves, we feel that any differences between mechanisms and routes of carbon assimilation and acquisition by coccolithophores are minor and make very little difference to the conclusions and the palaeoceanographic implications of the present study. We would like to reemphasise that the phenomenon of diminished vital effects at high carbon availability is the primary conclusion of this paper. The mechanisms behind these vital effects will be considered more quantitatively and in detail in McClelland et al. (in preparation). Perhaps we have been too ambitious in our ‘biogeochemical’ conclusions in the present study, and we are

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happy to follow the Referees’ suggestions on this matter.

For our revised manuscript, should we be encouraged to prepare one, there are different options on which we kindly seek the Referees’ opinions:

Option One: Try to more convincingly justify the calculation and use of the Bidigare Index in our study, particularly with regards of integrating CO₂ concentrations as this index does not merely apply on calcification, but reflects the dynamics of the whole intracellular carbon pool. However, as stated in our Authors Comment C6330, developing these aspects is beyond the scope of the paper.

Option Two: Replace CO₂ by DIC (HCO₃⁻) in the calculation of the *DCUT* index. This change would not alter any of our interpretations of the isotopic results, and perhaps be more consistent with the expression of the ¹³C vital effect by the ‘ $\delta^{13}\text{C}_{\text{cocco}} - \delta^{13}\text{C}_{\text{DIC}}$ ’ offset, as pointed out by Referee 2.

Option Three: Completely remove the *DCUT* index (*sections 3.3. and 4.2.*), and focus on a qualitative interpretation of isotopes and paleoceanographic outlooks only.

Of course, we welcome any additional advice to clarify this contentious point of our manuscript!

Last, we apologise for the lack of availability of the numerical dataset. This will be attached directly with the revised manuscript as Supplemental Tables.

The other points raised by Referee 2 will be addressed during the Author Response Phase.

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With best regards,

Michael Hermoso

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