

## ***Interactive comment on “Vanishing coccolith vital effects with alleviated CO<sub>2</sub> limitation” by M. Hermoso et al.***

**M. Hermoso et al.**

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Dear Dr Holtz,

Indeed, most of the linear correlations shown in the Discussion Paper between coccolith isotope fractionation and the Bidigare index  $[(\mu \times \text{volume}) / ([\text{CO}_2_{aq} \times \text{surface-area})]$  can be largely explained by changes in ambient CO<sub>2</sub> concentrations (see Figure 1 below) – for *C. pelagicus*, however, cell size and division rate seem important. This important point ought to be emphasised in our manuscript and we thank you very much for drawing our attention of this. The array of CO<sub>2</sub><sub>aq</sub> concentrations is significant and induces prominent effects on algal physiology (division rates cell geometry) via carbon availability, and most importantly for our study on stable isotope

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compositions of coccolith calcite.

Therefore, it may appear more suitable to show the correlations with CO<sub>2</sub><sub>aq</sub> concentrations in the revised manuscript (combined Figures 2 and 3) as per your suggestion, but we anticipate that colleagues, especially those working on palaeo-CO<sub>2</sub> barometry from alkenone  $\delta^{13}\text{C}$  would like to see how the Bidigare index that they use for organic carbon may work for inorganic carbon (taking into account your previous comments). This could be done as a multi panel figure (as shown below) or as a *Supplement*.

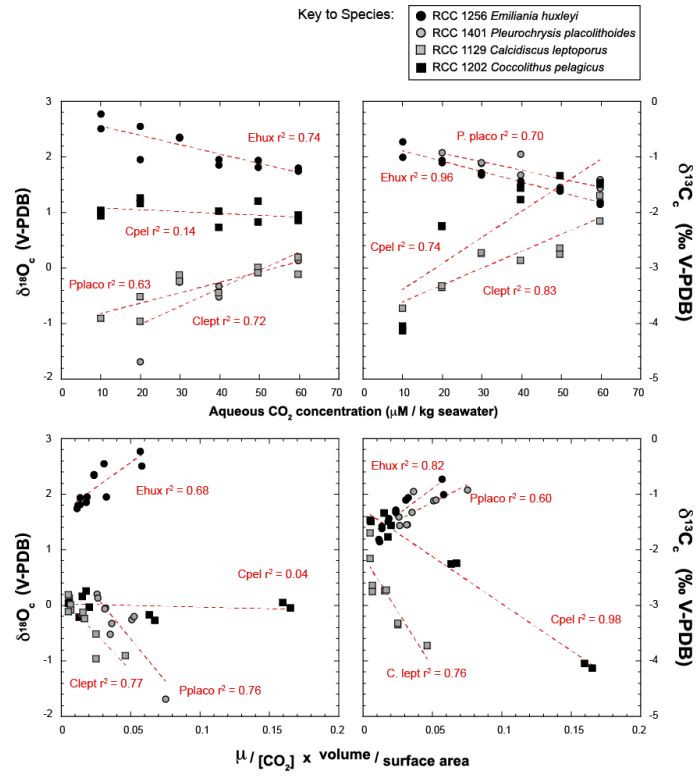
Thanks again for your help with this manuscript!

Michaël Hermoso

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**Fig. 1.** Raw isotopic composition of cultured coccolith calcite plotted against ambient  $CO_2$  concentrations (Top panels) and the “Bidigare Index” (Bottom panels).

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