

Biogeosciences Discuss., referee comment RC1
<https://doi.org/10.5194/bg-2022-68-RC1>, 2022
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Comment on bg-2022-68

Anonymous Referee #1

Referee comment on "Physiological control on carbon isotope fractionation in marine phytoplankton" by Karen M. Brandenburg et al., Biogeosciences Discuss., <https://doi.org/10.5194/bg-2022-68-RC1>, 2022

Brandenburg et al. synthesize the available data on stable carbon isotope fractionation in phytoplankton to test how this parameter (E_p) is controlled by CO₂ and other environmental parameters. This is a very well written and interesting paper and the data collection/analysis/interpretation seem very sound. I have hardly any comments, although I must admit that my knowledge on isotope fractionation is a bit rusted as I haven't followed the literature for a couple of years.

The key message of the paper is almost frustrating, nevertheless important. From my stand-point this paper requires only very minor revisions (but I hope the other Reviewer is more up to date on the topic than I am).

Minor comments:

Figure 2: I found the unit of the C-demand/C-supply a bit strange. Wouldn't it be easier to keep the unit as for the individual components and put them in brackets i.e. (C-demand unit)/ (C-supply unit)? Just a suggestion to facilitate understanding what this parameter means.

Line 165: "...prevents diffusion of CO₂ but is permeable for HCO₃⁻..." This surprised me. Are is CO₂ or HCO₃ mixed up, perhaps? Just double-checking.

The supplementary material could be moved to the main text. I don't see a reason to bury it there.

The figures are very well designed and informative.