

Interactive comment on “CO₂-induced seawater acidification affects physiological performance of the marine diatom *Phaeodactylum tricornutum*” by Y. Wu et al.

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Response to Referee #2 This is a nicely written paper, describing potential impacts of elevated CO₂ on the physiological performance of the diatom, *Phaeodactylum tricornutum*. The work has been carried out appropriately and is reported in a generally clear and concise manner. The results are straight forward and entirely consistent with what might be expected from the down regulation of CO₂ concentrating mechanisms (CCMs) in an elevated CO₂ state. The measurements of increased dark respiration and photoinhibition in elevated CO₂ are especially interesting. Response: No response is needed.

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For the non-specialist, it would be worth pointing out that changes in K_{1/2} (CO₂) (but not necessarily K_{1/2}(DIC) can be used as a proxy for changes in CCM activity. The authors should therefore also consider recalculating the K_{1/2} (DIC) values presented in Fig 3 as K_{1/2} (CO₂). Response: As suggested, we added an explanation to reflect this in 2.4 (M&M), and changed the abbreviation.

A passing comment - the authors refer to the impact of ocean acidification on coccolithophores as being negative (as indeed found by Riebesell et al 2000), but should at least refer to the other examples of work on coccolithophores that have shown no effect or a stimulation of calcification under high CO₂. Response: We have cited a recent paper by Iglesias-Rodriguez et al. for the balance.

In the methods and results the authors refer to high C or low C cultures then in the discussion on ln 5 p 3867 switch to referring to low and high pH cultures. I would suggest for clarity they use consistent terminology. Response: Reworded as suggested.

Interactive comment on Biogeosciences Discuss., 7, 3855, 2010.

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