

Interactive comment on “Key Arctic pelagic mollusc (*Limacina helicina*) threatened by ocean acidification” by S. Comeau et al.

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Received and published: 20 March 2009

I welcome this interesting and very timely paper. Ocean acidification impacts on pteropods are, as yet, relatively undocumented and are greatly needed to quantify the impacts expected as carbonate saturation changes with continued CO₂ inputs to the worlds oceans. This discussion manuscript details experiments to detect the effects of ocean acidification on calcification rates of a key Arctic ecosystem pteropod, *Limacina helicina*. This is a particularly timely manuscript in light of projections of change in ocean pH, especially in polar regions, in the near future. Radioisotopic ⁴⁵Ca incubations revealed calcification rates of *Limacina helicina* at two different pH settings and yielded a 28% reduction in calcification in the lower pH treatment. The Calcein stain shell growth experiments are also timely, providing important information for this Arctic

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calcifier. This type of experimental information is urgently needed in the ocean acidification research community and I would recommend publishing in Biogeosciences with minor changes.

I would recommend including full details of the sample sites, individual experimental pteropods, carbonate chemistry and laboratory experiments in a supplementary section, if not inside the main manuscript itself. For example, it would be good for other pteropod researchers to know how many pteropods from the original 50 were 'unhealthy', their size, sample depths, sample location details, etc. I agree with referee #1 regarding clarification of the Calcein staining results, particularly concerning Figure 2b. I also agree that the manuscript would benefit from figures showing shell growth under the two conditions, with measurements from all animals and a figure showing the slopes of calcification rates for the individual pteropods measured at time 0, 2, 4 and 6 hours. I agree with referee #2 regarding clarification of where/what type of water the experiments used. I note that the fjord temperature was 2.2°C but experiments were done at 5°C. Could you mention why you chose 5°C for the experimental temperature over the natural field temperature experienced by your *Limacina helicina* individuals?

I would recommend adding a citation for the recent Moy et al 2009 Nature Geoscience paper to this manuscript, particularly as it documents a major polar calcifiers calcification response to changing carbonate chemistry.

Introduction L24: Gazeaux et al 2007 – should be Gazeau et al 2007

Interactive comment on Biogeosciences Discuss., 6, 2523, 2009.

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