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Biogeosciences Discussions

Interactive comment on "Effect of increased $p\mathrm{CO}_2$ on early shell development in great scallop (*Pecten maximus* Lamarck) larvae" *by* S. Andersen et al.

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The ms by Andersen et al is a fairly straight-forward study of OA and bivalve development. To my knowledge this is the first study of a scallop and if so the authors need to state this. Overall the work seems sound but I do have comments and suggestions to revise the text as detailed below.

Abtract Line 5 ? change ?the? to ?a? ? we really do not know enough about the life cycle to say this ? In the introduction it could be stated that ??considered to be the most sensitive? ?. With citations as there are many. The potential effect of initiatial flux in pH as a confounding stressor has to be acknowledged in the abstract.

Intro/Dis

Here and at the end of the discussion the emphasis is on bivalves with discussion of findings with other molluscs. The authors stress interpopulation and interspecies variation in responses and one wonders about these variations. There are enough data now from many species and studies that I think it is now timely to provide an overview and address these issues. With regard to the bivalve section in the discussion ? section 4.5 ? it would be useful to put in a table. This is needed to address the small ?vs- large volume issue and other methodological differences among studies to try to make some sense of the variability. Are the differences real or an artifact- there are now many papers. For instance all the papers on C. gigas (eg. Kurihara, Parker, Gazeau) seem to differ ? why?? This is very important! The authors will need to cite Parker et al papers GCB, Mar Biol for oysters. There may be papers on other molluscs ? the abalone paper by Byrne et al 2011 Proc B comes to mind. Up front ? p. 3284 ? variation in experimental approaches has to be acknowledged as a confounding factor. I note that a subsequent paper by the Reis group (I think JEMBE) got an opposite result for a species covered in the 2009 paper ? so a ?but see?? is needed here.

3284 top ? need a citation for this sentence. The authors need to be careful in discussing data for ACC ? this is in an intracellular vesicle and so not exposed to surrounding water. This is a tightly regulated space and may not be vulnerable to disolution. To my knowledge this has never been shown. The authors will need to delete or find an appropriate citation.

Methods Some info needed ? fert in exp conditions? ? and what was the sperm conc, L. 12 ?Slow bubbling? ? I assume CO2? Was oxygen bubbled as well in parallel. Need to state that this work was done in a recirc system (can add that to the table comparing methods in the discussion). I presume only control larvae were stained with calcein? What is the pH of the calcein soln. 3287 ? 4% buffered formalin? ? correct? next pg ? stage survival was based on numbers placed in originally Delete all linear regressions ? they only have 4 points and this is no way a continuous data set. Just

represent as caegoric histograms with SE. (Why is SD used?). Shell deformations ? more information is needed to describe the categories and basis ? mover the text in the discussion ? eg His et al 97 to the methods. Have these been documented for scallops to form a basis for scoring ? cite the papers in the methods.

Results

The calcein data are not well incorporated into the experimental study. It is not clear why this was done. Fig. 7 legend ? state that these are control larvae. This work should either be deleted or placed in better context.

Expand the legend Fig 4 ? ?a? is a dead larva, put arrows to the shell deformities.

Discussion

First para is long winded ? you only need sentence #1 and this ca be incorporated below.

There are superfluous sentences that can be deleted: p.3293 ?Protruded velum?? 3294 ? all text on self-fert

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Interactive comment on Biogeosciences Discuss., 10, 3281, 2013.