

Interactive
Comment

Interactive comment on “Larval development and settling of *Macoma balthica* in a large-scale mesocosm experiment at different $f\text{CO}_2$ levels” by A. Jansson et al.

Anonymous Referee #1

Received and published: 25 January 2016

General issue: 1. Based on the abstract, I expected to read results on changes in the community, not a single species. My general feeling from the manuscript was that the authors used importance of the larger project, KOSMOS, was one of the main selling points of this article. The results are interesting enough in themselves, particularly the difference in response from the laboratory study to field/mesocosm study. The references to KOSMOS and other publications resulting from that project detracted from the results in this study. In particular, this study only reports the response of a single organism and not a community response. For example, in the abstract, “The response of organisms to future ocean acidification has primarily been studied in single-species experiments, whereas the knowledge of community-wide responses is still limited.

C9385

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper



To study responses of the Baltic Sea pelagic community to a range of future CO₂-scenarios, six 55 m³ pelagic mesocosms were deployed in the northern Baltic Sea in June 2012. In this specific study we focused on the tolerance, development and subsequent settlement process of the larvae of the benthic key-species *Macoma balthica* when exposed to different levels of future CO₂.” The authors state that the majority of studies report single-species experiments, that the mesocosms were used to study the community response, but that this study focuses on a single species. This can easily be addressed.

2. The decline in abundance in the control mesocosms is not accounted for. Do the authors have a suggestion as to why this occurred? Further, were samples taken from within the bay, outside of the mesocosms to control for the mesocosms themselves? These data become particularly relevant when the control mesocosms behave unexpectedly.

3. I found the use of M1-8 confusing, as it was not stated (outside of table 1), which mesocosm had which fCO₂ value. I suggest referring to the mesocosms not by Mx but by CO₂ level.

4. P20422 L 4-5: Is it possible from the samples collected to determine if shell thickness was reduced, resulting in an animal that is too light to settle? The delayed development/lengthened time to settlement is an interesting result and should be investigated in more detail, ideally in this publication. This would then rule in or out a lighter shell as the cause of the animal not being able to settle.

5. It is really interesting that the *M. balthica* responded differently to elevated CO₂ compared to the previous laboratory experiments. The authors should include a discussion as to why this may have occurred.

6. From your data, the “performance” of *M. balthica* was not actually reduced with increasing CO₂. Mortality was not increased, at least the number of settling individuals was the same, an increase in deformities was not reported or abnormal development

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper



other than the delay in settlement, the cause of which is also unknown. The final comments on p20424, are therefore not valid based on the current results. The negative comments should be toned down. The delay in settlement could very well have negative impacts, either on the individuals or on the community. If the authors believe this to be the case, then the potential impacts should be discussed in more detail during the discussion.

Technical comment: 1. P20412 L5: "...the system is already at present". Remove "at present" from the sentence. 2. P20412 L13-15. "We found that settling. indicating a development delay". These two sentences are unclear. At first reading, they express the same result. These could be combined eg: The size and time to settlement of *M. balthica* increased along the CO₂, suggesting a developmental delay. 3. P20412 l 25: "before" is not needed in this sentence as it is implied by "geological past". 4. P20413 l3: Similar to above "already" and "at present" suggest the same thing. Pick one. 5. 20413 l 15: "of post-larvae are" 6. 20416 l 18: Please write CTD in full, at least for the first use. 7. 20419 L4: Word reversal "total alkalinity measured on. . ." 8. 20421 L7 "an indication that *M. balthica*. . ." This result was observed; therefore the word indication should be removed. 9. P20422 L2: Replace "is" with "does" 10. P20423 L26: "Already at present. . .". As previously in the introduction, only one of these is necessary.

Interactive comment on Biogeosciences Discuss., 12, 20411, 2015.

BGD

12, C9385–C9387, 2016

Interactive
Comment

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper