

## ***Interactive comment on “The subtle effects of sea water acidification on the amphipod *Gammarus locusta*” by C. Hauton et al.***

### **Anonymous Referee #4**

Received and published: 25 February 2009

The paper by Hauton et al is an excellent investigation of the effects of ocean acidification on the amphipod *Gammarus locusta* during a month-long experiment. The authors did not find differences in growth or survival, but did find subtle, but compelling changes in gene expression that indicate higher metabolic costs for acid-base homeostasis under low pH exposure. This study shows that sub-lethal impacts of ocean acidification may be important in the energy budget of animals.

This research is a valuable contribution to the field, including its direct implications for *Gammarus*, but also in its integrative approach combining classical assay methods (i.e. survival and growth ) with gene expression analyses to explore the effects of OA exposure.

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Review questions: 1) Does the paper address relevant scientific questions within the scope of BG? The manuscript fits very well in the theme of ocean acidification addressed by the special issue.

2) Does the paper present novel concepts, ideas, tools, or data? Yes, the paper uses conventional assay methods and growth measurements now used widely by for ocean acification research, and cutting edge gene expression methods to evaluate animals responses, particularly the subtle but important upregulation of genes likely to be involved in acid-base homeostasis.

3) Are substantial conclusions reached? Yes, the paper found no obvious changes in growth or survival due to pH exposure, but detected important metabolic changes indicating that amphipods exposed to low pH treatments were metabolically stressed.

4) Are the scientific methods and assumptions valid and clearly outlined? Yes

5) Are the results sufficient to support the interpretations and conclusions? Yes

6) Is the description of experiments and calculations sufficiently complete and precise to allow their reproduction by fellow scientists (traceability of results)? Yes, the authors do a very good job providing details of their methods, analyses and results.

7) Do the authors give proper credit to related work and clearly indicate their own new/original contribution? Yes

8) Does the title clearly reflect the contents of the paper? Yes

9) Does the abstract provide a concise and complete summary? Yes

10) Is the overall presentation well structured and clear? Yes, the manuscript is well organized, the prose is quite readable, and the results presented clearly, including discussion of molecular methods and results that can be difficult for some.

11) Is the language fluent and precise? Yes

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12) Are mathematical formulae, symbols, abbreviations, and units correctly defined and used? Yes

13) Should any parts of the paper (text, formulae, figures, tables) be clarified, reduced, combined, or eliminated? No, I think the paper should be published, as is..

14) Are the number and quality of references appropriate? Yes

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Interactive comment on Biogeosciences Discuss., 6, 919, 2009.

## BGD

6, S202–S204, 2009

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