

Interactive comment on “Meiofauna winners and losers of coastal hypoxia: case study harpacticoid copepods” by M. Grego et al.

Anonymous Referee #2

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This manuscript describes the response of meiobenthic copepods to hypoxia and anoxia which are among the most common and harmful threats to marine benthic communities worldwide. This study is very interesting especially that concerns the effect of oxygen decline and anoxia on harpacticoid copepods - meiobenthic group considered as the most sensitive to oxygen depletion. The observation described in this manuscript shows that although the majority of copepods have not survived the first days of oxygen decline, some copepods belonging to one family were able to survive 2 months in the anoxic sediment. The clear advantage of this experiment is the experimental method used to induce hypoxia and anoxia that has been tested by the authors in their earlier experiments performed at the same study site and described in detail together with the results of these experiments in already published papers. This manuscript should be published but I would like to focus on some issues that require,

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in my opinion, more attention or explanation.

The authors sliced the sediment in very thin layers. It would be very interesting to see how the vertical distribution of copepods changed over time. The results from separate slices are analysed based on the dendrogram but I would like to see a simple figure presenting vertical patterns of copepod concentrations after 9 days, 1 and 2 months. In normoxic conditions copepods were present to the depth of 2 cm and, I guess, the majority of them were concentrated at the sediment surface. It would be interesting to show how (if so) copepods migrated in response to oxygen decline and would probably help to better understand the processes in the upper two sediment cm. There is a lack of information on oxygen concentration changes in the sediment in this experiment and it is mentioned that since the chambers were not shaded the microphytobenthic production cannot be excluded, at least at the beginning of the experiment. Since there is no evidence on oxygen levels in the sediment, can be the first treatment (A9d) considered as really anoxic? From the method description we conclude that the A9d samples were taken after oxygen decline and very short term anoxia recorded in the overlying water (it is not entirely clear to me whether this anoxic period took 2 or 4 days: the A9d chamber was deployed on 2 August and was sampled on 11 August so after 9 days. But further in the text it is stated “that anoxia in this chamber was reached after 5 days, that is two days before the samples were taken”. It is unclear to me when exactly the samples were taken: after two or four days of real anoxia?). In this context, I think that the 9-days long treatment cannot be considered as a real A9d anoxia.

Statistical analyses: ANOVA is performed to analyse the results but it is not mentioned whether the data meet the assumptions necessary to perform parametric analyses. Multivariate analyses are performed with ANOSIM test (it is stated that ANOSIM test was performed “in addition” to MDS. In my opinion, it is more elegant to perform first the analysis of similarities and then use MDS plots to visualize the results), but given the number of replicates (3, while most of the Primer routines perform best with a minimum of 4 replicates) it seems that PERMANOVA would be an ideal statistical method to

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compare the differences among treatments. It would be then interesting to include the depth factor into PERMANOVA analysis.

It is stated that 'almost all chambers were deployed at the same time', but further in the text (Page 12389, lines 21-28) we read that their deployment times varied.

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