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Interactive comment on "Calcification and inducible defence response of a calcifying organism could be maintained under hypoxia through phenotypic plasticity" *by* Jonathan Y. S. Leung and Napo K. M. Cheung

Anonymous Referee #2

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The manuscript by Leung and Cheung provides information regarding how calcification processes in polycheate worms could be influenced by future hypoxia. The results are pretty straight forward, and I consider these types of studies are important, although not ground-breaking. I have a few concerns that should be addressed before this manuscript could be accepted.

The grammar and style should be improved in the introduction and discussion of this m/s before it could be published in any outlet. There are too many examples of this for me to highlight every one, but for example the use of the term "defence response".

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Discussion paper

I suggest the authors ask a senior colleague who is a native English speaker to read over and correct for them. In general there is also a lot of speculation for a 21 day long study.

Specific comments: Line 40: In general I agree that calcification costs energy, but in some organisms the energy-dependence has been postulated as low (e.g. in corals – see McCulloch et al. (2012)). So this may be true for gastropods, but not necessarily so for some other organisms. So this sentence needs to be balanced somewhat. Line 70: The hypotheses around phenotypic plasticity needs to be strengthened and clarified. What exactly is the phenotype that is plastic here? The capacity to form different types of mineral in the shell? Or simply that responses will differ between control and reduced O2 concentrations? Reading the discussion, I think the authors are misusing the term phenotypic plasticity. Demonstrating variability in responses of individuals within the same population to a stressor is not demonstrating phenotypic plasticity, nor is demonstrating a different response under different treatments between different individuals. Line 82: How was pH measured, and on what scale, using what buffers? More information needed here. How was salinity and temperature measured? I see some of these details in table S1, but there are required in the methods section. Statistical analysis: why use a permanova? I would expect each parameter to be separated analysed using univariate analyses as a first step. A justification for using permanova over an anova or linear model needs to be justified here. Line 191-192: But this statement is at odds with the findings of the permanova and the figures, that calcification was impacted by hypoxia in this study. Also, the end of the sentence that this could be due to phenotypic plasticity needs to be explained, as this makes no sense to me.

References used in the review: McCulloch MT, Falter J, Trotter J, Montagna P (2012) Coral resilience to ocean acidification and global warming through pH up-regulation. Nature Climate Change, 2, 623-627.

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