

Interactive comment on “Skeletal mineralogy of coral recruits under high temperature and $p\text{CO}_2$ ” **by T. Foster and P. L. Clode**

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We would like to thank Reviewer #1 for their time and for helpful comments on our manuscript. Below we address Reviewer #1's questions and indicate the revisions we have made to the manuscript.

Comment: However, the paper lacks general flow, appearing poorly written in some sections (e.g. the introduction is redundant). Answer: We have re-worded several sections in the introduction for easier reading. Comment: Because of the simplicity of the analyses, it would be interesting the addition of other treatments and not only of the range ecologically relevant used. Extreme values of temperature and $p\text{CO}_2$ could consolidate the conclusions that neither temperature nor $p\text{CO}_2$ affected mineralogy on coral recruits. Answer: This experiment was designed as part of a larger study looking

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at the impacts of ecologically relevant temperature and $p\text{CO}_2$ treatments on larval and juvenile coral physiology. We chose to use values that are relevant to what corals will be subjected to in the near future in order to provide practical insights into their ability to adapt and survive. Although we chose to use only ecologically relevant values for this study, Reviewer #1 is correct in suggesting that effects of temperature and $p\text{CO}_2$ on mineralogy under extreme conditions could be investigated and perhaps a change in mineralogy would be observed. We have added the following section to the Discussion to acknowledge this: “Both the elevated temperature and elevated $p\text{CO}_2$ conditions applied in this study were ecologically relevant values, chosen to correspond to future projections for atmospheric CO_2 by 2100, under a business-as-usual (RCP 8.5) emissions scenario (Meinshausen et al., 2011; IPCC, 2013). However, applying more extreme values for both temperature and $p\text{CO}_2$ could potentially identify changes in the mineralogy under extreme conditions.” Comment: In the discussion not much debate is posed about ecological implication for coral recruits survival: how these organisms without the production of calcitic skeletons can face out to future scenarios of “calcite sea” conditions? Answer: We have added the following to the Discussion: “It is likely that new coral recruits will continue to produce aragonitic skeletons under future emissions scenarios, however at reduced calcification rates (Cohen et al., 2009; Anlauf et al., 2011; Foster et al., 2014). Recruits require high calcification rates and robust skeletons to both maintain their position on the substrate as they compete with other benthic organisms for space (Dunstan and Johnson 1998), and also to rapidly outgrow the high mortality rates of the smallest and most vulnerable size classes (Babcock 1991; Babcock and Mundy 1996). Reduced calcification rates and more soluble aragonitic skeletons will have implications for the longer-term survival of young corals, as these factors will increase mortality rates in the early stages of growth and development thereby reducing the numbers of recruits that survive into adulthood.”

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