

Interactive comment on “Mineralogical response of the Mediterranean crustose coralline alga *Lithophyllum cabiochae* to near-future ocean acidification and warming” by Merinda C. Nash et al.

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This is an interesting study of the mineralogical responses of a Mediterranean coralline alga under elevated levels of pCO₂ and temperature. The study compared live and dead portions of the crust to sort out abiotic effects from those that are biologically mediated on how the alga incorporates Mg into its MgCaCO₃ thallus.

Interestingly, there was no change in the % MgCO₃ under elevated pCO₂. Because the study duration was a year, seasonal changes were integrated. Although the paper is not an easy one to read because it is so information dense, it is important and should

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have a reasonable impact beyond just the coralline algal specialists. There are more papers in recent years indicating that greenhouse gas impacts on calcifying organisms is more complicated than we once thought. How organisms respond metabolically to elevated levels of carbon dioxide requires more study. This is a solid piece of work that only scratches the surface. For example, what evidence is there of the metabolic costs of mediating elevated levels of carbon dioxide? If this is metabolically expensive, might other factors suffer from these costs? For this coralline, how does overall growth rate change as a function of temperature and pCO₂? Those questions are beyond the scope of the present study but they do suggest new avenues of research this sort of study will likely stimulate.

Specific comments:

This is generally well written.

The pigmented zone on many corallines does not delimit the living tissue. However, on the thin pieces illustrated in Fig. 1 they may. Nevertheless, the “pink” thallus simply has pigments and it can vary in depth into the thallus. I did not see anywhere, where the thickness of the pigmented tissue was reported for the upper and for the lower surface of these crusts. Given the attention given on mineralization that occurs in the pigmented region, that thickness seems to me to be important. (e.g., see lines 200 – 202)

Line 71: replace “preferentially with differentially.

Line 108: Fragments 2 – 3 mm are extremely small with considerable exposed thallus relative to the entire photosynthetic surface area. Could this have had an effect on the outcome of the experiment?

Line 108: I suggest you replace the second use of the word “diameter” with “thickness”.