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Interactive comment on "Relative roles of endolithic algae and carbonate chemistry variability in the skeletal dissolution of crustose coralline algae" *by* C. Reyes-Nivia et al.

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Dear Reyes-Nivia et al.,

Thank you very much for this exiting and stimulating study highlighting the importance of microbial bioerosion for tropical coral reef framework stability and carbonate budget, as well as for other habitats supported by crustose coralline algae!

First a small comment: You state that 'dissolution rates of skeletons without photo-endoliths were dramatically higher (200%) than those colonised by endolithic algae'. This statement is misleading since the recorded rates are only about 100% higher, thus 'rates double' or 'rates twice as high' would express your results in a more intuitive

manner.

Furthermore I would like to encourage the authors to clarify the following methodological issues:

1) You prepared your recently dead CCA substrates by immersion of live CCA samples 'in hot seawater (50°C) for 10 min to kill the algae'. What is your reasoning for such a short and mild treatment? How can you be sure that this treatment did actually kill not only the CCA but also the microendoliths hidden within the substrate where they are able to buffer short-term environmental changes to a certain extend? In any case, this treatment did not remove the killed tissue of both the CCAs and the microbial endoliths, likely leading to bacterially mediated maceration of the dead organic matter during the course of your experiment and resulting in a drop in interstitial pH – a fact that should be considered in the discussion.

2) You address the replicates kept in constant darkness as 'without photo-endoliths' and thus showing an 'environmental effect' only. While the former is correct, the latter might not. Why do you exclude the possibility of colonisation by organotrophic fungi and other non-phototrophic bioeroders (endolithic bryozoans or foraminiferans for instance)? Did you quantify the biomass of replicates kept in total darkness as you did for the light/dark ones, which would allow you to demonstrate the absence of such bioeroders? The contribution of endolithic fungi (also in a light/dark treatment) is easy to underestimate since these fungi are quite difficult to detect and to identify.

3) In your experiment you record the pioneer phase of microbioerosion on a partly previously bioeroded substrate, hence a shift from dead (but already bioeroded) substrate (in both the dark and light/dark replicates) to the density recorded at the end of the experiment. This fact could be considered in the discussion since the observed effect would have possibly been even more pronounced if you would have worked with a mature and live microbioerosion community in the light/dark replicates from the start.

best wishes, Max Wisshak

Interactive comment on Biogeosciences Discuss., 11, 2993, 2014.