

Interactive comment on “Measuring gross and net calcification of a reef coral under ocean acidification conditions: methodological considerations” by S. Cohen and M. Fine

Anonymous Referee #2

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In this paper, the authors examined the effects of ocean acidification on coral calcification by using *Stylophora pistillata* which has been often used in ocean acidification studies. The authors focused on the importance of dissolution of coral skeletons under acidified seawater condition which has not been underestimated so far. I agree with the importance of dissolution to consider the effects of acidified seawater on coral calcification, but the authors' approach does not seem to be enough to evaluate this point. I could not also understand the reason why the authors performed long-term experiment for their research's aim. In addition, many descriptions seem to be ambiguous which prevents the readers' understanding. I recommend the authors improve the manuscript thoroughly according to some comments below.

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General comments

To distinguish gross and net calcification, the authors used TA and ^{45}Ca methods. However, if dissolution occurs repeatedly, ^{45}Ca method is not always valid for measuring gross calcification (e.g., if coral skeleton including ^{45}Ca dissolved into seawater).

I could not understand why the authors performed long-term experiment although the authors emphasized the importance to distinguish between gross and net calcification. Was long-term experiment necessary for the authors' main aim? I think the possibility of acclimation of corals to OA is interesting, but this would lead to many confusions in this manuscript.

In Table S3, the values of the carbonate chemistry seem to be very unstable, which affected the result of coral calcification in this study. Thus, I am not sure whether the results presented here are valid.

Although the authors concluded that "*S. pistillata* may fall into the "low sensitivity" group", but previous studies suggest that this species is also affected by acidified seawater. This point should be discussed more carefully.

Specific comments

Introduction The authors should also add some information on light-enhanced or dark-repressed calcification of corals in Introduction (e.g., see Gattuso et al. 1999) because the authors compared calcification between light and dark conditions. Gattuso JP, Allemand D, Frankignoulle M (1999) Amer Zool 39:160-183

2.1 Coral preparation and maintenance The authors used eight colonies of their target species, but I could not understand how many fragments were prepared from these colonies. The authors should add the detail.

I recommend that the authors add the information on the reason for setting temperature as 25 degrees centigrade.

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The nutrient concentration significantly affects coral calcification under acidified seawater condition (see Chauvin et al. 2011). I recommend that the authors add the information on nutrient of the seawater used in the study. Chauvin, A., Denis, V., Cuet, P., 2011. Is the response of coral calcification to seawater acidification related to nutrient loading? *Coral Reefs* 30:911-923

2.2.1 Incubation procedure Although the authors proposed "we use the term "acclimation" in this paper to indicate long-term incubation at a certain pH condition" in this paragraph, I think this content should be separated in another paragraph to avoid confusion (e.g., "Short-term incubation" and "Long-term incubation").

3.2 Comparing gross and net calcification "repeated measure ANOVA"->"repeated measures ANOVA"

Fig.1 I recommend the colors (grey and yellow) of bars should be changed to each other (light (yellow bars) and dark (grey bars)).

Table 3 Here, the authors showed Open/closed vessels, but I could not understand the reason why the authors used these two types. The authors should explain this reason in the main text.

Interactive comment on *Biogeosciences Discuss.*, 9, 8241, 2012.

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