

Interactive comment on “The impact of seawater calcite saturation state by modifying Ca ion concentrations on Mg and Sr incorporation in cultured benthic foraminifera” by M. Raitzsch et al.

T. Toyofuku (Referee)

toyofuku@jamstec.go.jp

Received and published: 25 January 2010

This study evaluates the influence of calcite saturation state on foraminiferal test chemistry (Mg/Ca and Sr/Ca). Recently, ocean acidification has become a worldwide topical issue for the scientific community. I believe the scope of this study is very relevant for the broad audience of BGD. It is based on precise and reliable laboratory experiments. The experimental design is clearly presented. The investigated species for culture experiments are appropriate. Measurements are performed in a proper way. And interpretations and conclusions are supported by observations. Therefore, this study suits to be published in BGD after minor revision.

C4138

I have two major points.

1. experimental water chemistry for *H. depressa* Mg/Ca of seawater (Mg/Ca sw) conditions has changed from 5.2 to 6.2 with calcite saturation state for *H. depressa*, while the Mg/Ca sw ratios indicate almost same value for *A. tepida*. This Mg/Ca sw variation for *H. depressa* can not be ignored. The fact should be mentioned by authors via a comparison between *A. tepida* and *H. depressa* in Result and Discussion.

2. clear differentiation between calcite saturation state and [Ca²⁺] The experimental variable is calcite saturation state in this study. 5 times larger [Mg²⁺] changing is occurred when the [Ca²⁺] is changed. The variations should be caused by difference of calcite saturation state of seawater and not caused by only [Ca²⁺]. I think it is inadequate that the result will be argued by the effect of [Ca²⁺] only.

*** The sequential comments. p.11347 >The impact of seawater calcite saturation state by modifying "Ca" ion concentrations on Mg and Sr incorporation in cultured benthic foraminifera. I feel that the experimental variable would be only [Ca²⁺] in this study from this title. Is it OK?

p.11352 l.10-15 The Mg/Ca sw has slightly changed among the conditions for *H. depressa*. I think the fact should be mentioned when you want to compare results between this species and *A. tepida*.

p. 11353 L. 20 The information of light source (e.g. intensity or Photosynthetically Active Radiation (PAR)) is required, as far as authors deal with symbiotic species.

p. 11354-11355 In my impression, growth rate of 29% and 47% is a little bit small for 2-months incubation. Had the specimen already matured from the beginning? Could you give the table about the growth of specimens, too?

P. 11355 L. 2 >... specimens precipitated new "calcite". I think "chamber" is good at here.

P. 11356 L. 22 The overgrowth specimen should be pictured in gray in the Sr/Ca plot,

C4139

too.

P. 11356 L. 23 Could you show the SEM photo? I am interested with the thickness of the wall and looks of the test surface from each condition.

P. 11357 L. 9 Mg/Ca of seawater is modified with calcite saturation state for *H. depressa*. This fact should be mentioned in the paragraph.

P. 11358 L. 11 The varied Mg/Ca of seawater is considered in this discussion?

P. 11359 L. 15 >with increasing calcite saturation state Is the effect of Mg/Ca sw truly negligible?

Interactive comment on Biogeosciences Discuss., 6, 11347, 2009.