

Interactive comment on “Non-lethal effects of ocean acidification on two symbiont-bearing benthic foraminiferal species” by A. McIntyre-Wressnig et al.

LJ de Nooijer (Referee)

nooijer@geo.uu.nl

Received and published: 14 October 2011

Dear Editor,

Please find below my review for the manuscript entitled “Non-lethal effects of ocean acidification on two symbiont-bearing benthic foraminiferal species” by McIntyre-Wressnig et al. (bgd-8-9165-2011). Since two reviewers have already commented on this manuscript, I will not repeat any of their points and only add to their comments.

Regards,

Lennart de Nooijer

C3579

Additional comments:

The measured DIC concentrations and TA values should be reported in addition to the (calculated) pH and ΔpH (Table 1). Why is the uncertainty in the pH and ΔpH reported as SE instead of SD (Table 1, Figure 1)?

The changes in salinity during the experiment are likely to have impacted the $[\text{CO}_3^{2-}]$, and thereby ΔpH . Considering the small volume of the culture vessels, the impact may have been large! Could the authors estimate the additional error in the determined inorganic carbon parameters as a result of changes in salinity?

The relation between dissolution and the chemical composition of the two species' calcite needs to be discussed. It is not surprising that the shells dissolve at an $\Delta\text{pH} > 1$, since presence of Mg increases the solubility of (foraminifer's) calcite (see e.g. Yamamoto et al., BGD). Please add Mg/Ca of the two species and the estimated ΔpH at which calcite with those Mg/Ca may start to dissolve at a rate that can be detected during the culturing experiment. Also, the outer layer of calcite in foraminifers may be enriched in Mg (e.g. Hathorne et al., 2009; Paleoceanography), making the outer layer particularly susceptible to dissolution. Could it be that the newly produced chambers have a different Mg/Ca as a response to the induced OA?

In many foraminifera, the outer most chambers are often not occupied by cytoplasm. Could this have lead to an overestimation of the cell's volumes (section 2.6)? And hence have affected the ATP concentrations? If so, how large could this uncertainty be?

Interactive comment on Biogeosciences Discuss., 8, 9165, 2011.

C3580