

Interactive comment on “Effect of salinity induced pH changes on benthic foraminifera: a laboratory culture experiment” by R. Saraswat et al.

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Reviewers' Comment: My main concern with this manuscript is the experimental design. Since pH and salinity co-vary in all treatments, it is not possible to distinguish between the effects of these two parameters.

Authors' Response: The experiment was designed to understand the nature and extent of natural dissolution of foraminiferal calcite under seasonal very low salinity condition. A seasonal very low salinity zone develops in shallow water regions of the monsoon influenced areas. We tried to understand how the low salinity waters which obviously have low pH, will affect foraminiferal calcite. Therefore, this experiment is an attempt to understand the component of dissolution of carbonates not associated with CO₂ induced global ocean acidification. We have not tried to distinguish between the effect

C6478

of salinity and pH on foraminifera. The objective of this paper is to understand how the natural seasonal salinity changes, which also lead to a change in seawater pH and alkalinity, affects foraminifera (please see attached figure).

Reviewers' Comment: Contrary to the authors' assumption, there are several papers available which describe the effect of ocean acidification on benthic foraminifera (at least one of these papers has been published in Biogeosciences).

Authors' Response: We agree with the reviewer that there are a few more papers which we forgot to cite. These references (Kuroyanagi et al., 2009; Lombard et al., 2010; Hikami et al., 2011; McIntyre-Wressnig et al., 2011; Fujita et al., 2011) have been included in the revised manuscript and findings of our work have been discussed in context with the findings of these papers.

Reviewers' Comment: pH was measured using an electrode. The authors need to provide details on how measurements were conducted, report precision of the measurements, and need to indicate which pH scale they used (see “Guide to best practices for ocean acidification research and data reporting”; Riebesell et al., 2010).

Authors' Response: The pH was measured by Labindia PHAN microprocessor controlled pH analyzer with a precision of ± 0.02 pH units and ThermoScientific Orion Star A329 multi parameter meter which has a precision of ± 0.01 pH units. For pH measurements, the electrode was standardized by using NIST buffers of pH 4, 7 and 10 at 25°C. The total alkalinity was measured by using VINDTA (Versatile INSTRUMENT for the Determination of Total Alkalinity) system.

Reviewers' Comment: It would have been preferable if the authors had measured a second carbonate system parameter.

Authors' Response: In order to answer reviewer's concern, we have measured alkalinity of the samples and the same has been discussed in the revised manuscript.

Reviewers' Comment: Even though experiments were conducted in replicates, no sta-

C6479

tistical tests were performed.

Authors' Response: Though we have mentioned the error margin of our findings based on the replicate analyses, further statistical analysis has been included in the revised manuscript as suggested by the reviewer.

Reviewers' Comment: Results and discussion sections are very confusing.

Authors' Response: Both of these sections have been rewritten in view of the reviewer's suggestion.

Interactive comment on Biogeosciences Discuss., 8, 8423, 2011.

C6480

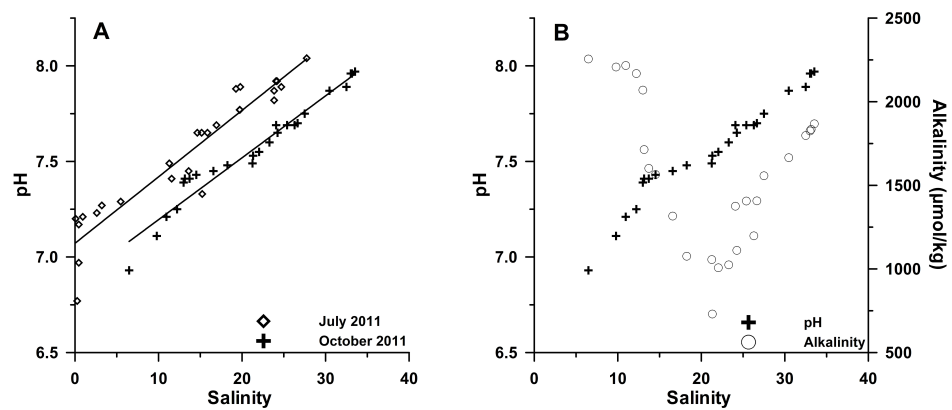


Fig. 1. Relationship between salinity, pH and alkalinity of the seawater collected from the Mandovi-Zuari estuaries.

C6481