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Biogeosciences Discussions

Interactive comment on "Early diagenetic overprint in Caribbean sediment cores and its effect on the geochemical composition of planktonic foraminifera" *by* M. Regenberg et al.

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The manuscript by Regenberg et al. deals with the impact of early diagenesis on the oxygen isotopic composition and the Mg/Ca and Sr/Ca ratios in several species of planktonic foraminifera. The authors demonstrate convincingly that in the vicinity of carbonate platforms, high magnesium calcite and aragonite dissolution followed by reprecipitation of crystallites on the surfaces of empty foraminiferal shells severely impacts the primary environmental signals. The paper not only addresses a highly important issue for paleo reconstructions but is also well written.

I have only a few minor comments: 1) On p. 2191 you state: "..show to some extent

atypical values with respect to previously published data sets reflecting past environmental conditions (Figs. 4, 5)." It is clear that your data are atypical with respect to the published ones. Yet, it might be usefull (although not necessary) to state why the published records reflect the "true" environmental conditions.

2) The crystalline overgrowth is estimated to amount to 10 to 20% by weight. This observation has important implications as well for the study using so called "size normalized weight" (SNW). In fact, SNW may help to estimating the potential geochemical contamination at your site.

3) on page 2182 you mention HMC and LMC for the first time. Please write high-magnesium calcite (HMC) and low-magnesium calcite (LMC).

4) On page 2183: "....foraminifera Globigerinoides sacculifer (without sac-like final chamber)". I know that this is used by everybody in this way and therefore leave as it is but G. sacculifer without a sac-like final chamber is stricktly speaking Globigerinoides trilobus.

5) On page 2188: "...corresponding to temperatures of 32.2C and 33.1C, respectively.". Please add that planktonic foraminifera, or at least the species you analysed, are not very likely to survive those temperatures (Bijma et al., 1990).

Bijma, J., Faber, W.W., Jr. and Hemleben, Ch., 1990.Temperature and salinity limits for growth and survival of some planktonic foraminifers in laboratory cultures. Journal of Foraminiferal Research, 20(2), 95-116

6) Page 2190: in this paragraph you refer to fig. 7 and 8 comparing cleaned and uncleaned specimens. The figures in this section do not clearly support the text and it requires to link every panel to passages in the text. When looking at fig. 7 and 8 independent of the text this is what I saw.

Specimens in fig. 7a, 8a, b and c are uncleaned but at least the inner surfaces of 7a and 8a and 8c look clean to me when comparing to 8b which clearly shows the

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crystallites. Also fig.7e (uncleaned) and even fig.7f (cleaned!) demonstrate crystallites. Why do I not see crystallites on 7a and 8a and 8c. The pores in fig 8a and 8c also seem normal. On the contrary the pores in fig. 8d seem to be constricted even after cleaning. Fig. 7b, c, d and 8d are cleaned. I suppose that the microstructure in 7b and d and 8d is due to dissolution during the cleaning process. The impact of dissolution is not obvious in fig. 7c.

If you can get hold of specimens from the reference sites you use as a baseline for geochemical comparison ("the uncontaminated primary signal"), it would be interesting to compare SEM figures of those specimens with the ones from your site.

Interactive comment on Biogeosciences Discuss., 4, 2179, 2007.