

Interactive comment on “I / Ca ratios in benthic foraminifera from the Peruvian oxygen minimum zone: analytical methodology and evaluation as proxy for redox conditions” by N. Glock et al.

Anonymous Referee #1

Received and published: 30 September 2014

I am currently devoted to iodine proxy development for various applications, including foram I/Ca. It is a pleasure to see more labs become involved in the proxy. Overall, this is a nice piece of work well-suited for Biogeosciences. Other than a few interpretations that I slightly disagree with the authors, it should be a well-cited paper a few years down the road, wherever it's published.

Infaunal species showing a statistically better calibration in this sample set does not prove that infaunal species are better than epifaunal one for bottom water O₂ reconstruction. The O₂ penetration/gradient in shallow porewater are highly variable spatially and temporally. The living depth (below seafloor) may vary among infaunal species and may also change during the life cycle of the same species. Intrinsically, it is complicated

C5548

to use infaunal species for quantitative bottom water O₂ reconstruction. I will probably remain unconvinced until similar calibration for *Uvigerina striata* is observed in another location.

My second major comment is about the vital effect. That indeed could be the reason for the large difference between *striata* and *pergrina*. However, the O₂ and hence iodate gradients in porewater are very steep. Because of the foram migration within sediments, the actual calcification depths for these species may be slightly different within the same genus, which could correspond to very different porewater iodate concentrations considering the steep concentration gradient. I'm not sure it is a matured conclusion to pin it completely on vital effect, based on the observations in this study.

The large variability in *P. limbata* seems to be discouraging. However, can it simply be the real changes in bottom water O₂? The OMZ boundaries could easily move up and down over time scales of seasons or even weeks. If I have to pick one calibration that I trust the most for bottom water O₂, I may still pick epifaunal over infaunal ones, regardless of the variability within shells.

For the analyses part, our JCp-1 is fairly homogenized straight out of the bottle. Measuring multiple powder splits or multiple dilutions from a single dissolved sample do not show large differences. To summarize it up, good work definitely worthy of publishing, although I would prefer more balanced interpretations on a few spots mentioned above.

Interactive comment on Biogeosciences Discuss., 11, 11635, 2014.