

## ***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.***

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I have received this manuscript before for a so called “quick review” and provided some comments. Many of those comments have already been taken care off in the present manuscript but some issues remain.

First of all, this paper is a valuable contribution for BG(D). The msc is well written but some formulations should be checked by a native English speaker. For instance, introduction, line 14, p. 11639: “foramnifera“ should be “foraminifera”. Introduction, line 23: “oceanic warming“ should be “ocean warming”. Line 25, p. 11647: “Due to the TROX model the living depth...” should be “According to the TROX model, the living

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depth ...”. Line 29, p. 11647: “. . . . to migrate in the pore waters. . .” should be “. . . . to migrate into the pore waters. . .”. These are just a few examples. Also, please spend some “;”.

Below are a few minor remarks.

The text can also be more concise, for instance: Abstract, line 5-7: “We test cleaning and measurement methods to determine I / Ca ratios in benthic foraminifera from the Peruvian oxygen minimum zone.” Leave out the last part because you have already mentioned that. Just write: “We test cleaning and measurement methods to determine I / Ca.” Also: Abstract, line 12-14: “Although I / Ca ratios in benthic foraminifera might prove to be a valuable proxy for changing redox-conditions the iodine volatility in acidic solutions, . . .”. Leave out the first part to be more concise: “The iodine volatility in acidic solutions, . . .”.

Abstract, line 15-16: “severely interfere with. . .” change to “need to be accounted for when applying the. . .”

The authors picked two infaunal species and two epifaunal species: Is there any proof that “In an eutrophic environment like the Peruvian OMZ where organic matter at the seafloor is available in excess (Mallon et al., 2012) an overprint by the organic flux is not to be expected.” (line 15-17, p. 11639)? I doubt that and would still expect to see a difference between bottom and pore water and in line 11, p. 11647 you write: “. . .since the oxygen gradients in the pore waters are quite steep”. Any data available?

Although this msc focusses mostly on “analytical methodology and evaluation as a proxy for redox conditions”, it would be good to expand a bit more on some of the other aspects, that are just as important if applying proxie relationships. The authors already did quite a good job in section 4.2 but could, if data allow, be more specific. For instance, if you look at the variability of I/Ca (see 4.2, p.11646, line 17-20: “Furthermore, the variability of foraminiferal I/Ca ratios by location (e.g. [O<sub>2</sub>]BW) or species is much higher than the uncertainties discussed in Sect. 4.1, which indicates that the rends in

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the I / Ca-[O<sub>2</sub>]BW relationships are robust in respect to the technical issues.”), it seems that, at this stage, it is more of a qualitative proxy (more or less oxygenation) than a quantitative one. They should comment along those lines or add some additional information. For instance, line 2-3, p 11647: “Consequently, some samples are limited to one analysis.”. If data are available, I suggest to add a discussion on “patchiness” (how much of the signal is local variability) and to add a statistical discussion on how large the sample size should be to get robust numbers (e.g. use a “Jack-knife” technique).

Last but not least, the last sentence in the conclusion reads: “When samples are carefully prepared and measured, accounting for the pitfalls outlined here, the resulting I /Ca ratios from benthic foraminifera analysis may be considered a robust proxy for redox conditions in the ambient water mass.” In the light of the discussion, I suggest to tone down this conclusion.

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