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## ***Interactive comment on “Living (Rose Bengal stained) benthic foraminiferal faunas along a strong bottom-water oxygen gradient on the Indian margin (Arabian Sea)” by C. Cauille et al.***

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This paper presents engaging discussion about the relationship between oxygen availability and the distribution and percentage of agglutinated taxa in foraminiferal assemblages living on the Indian Margin. The methodology is sound and the paper is well written and of high quality. Although I do not necessarily agree with all of the conclusions, I found the results and discussion to be quite interesting.

Specific Comments

I suggest that the abstract include the size fractions examined (>300 and >150 microns). Although the authors make a case for the likelihood that the <150 micron as-

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semblage does not differ substantially from the >150 micron assemblage, the abstract should make it clear that the conclusions are based on examination of >150 micron assemblages.

Do not use the term “successions” (line 23, page 3255 and elsewhere) when referring to microhabitats or transect assemblage patterns. In ecology this term refers to something else entirely.

Page 3256, line 20: The <150 micron assemblage contains not just small species, but small individuals of large species. In oxygen-poor environments, the percentage of <150 micron individuals can be quite high. Although the 63-150 micron assemblage may be similar in species composition and diversity as suggested in lines 25-27, abundances and percentages of species (and hence designations of dominance) can be quite different when comparing >63 micron and >150 micron assemblages.

I agree that the data clearly show that some agglutinated taxa can tolerate strong oxygen depletion. This is an important finding. While I understand the reasoning behind the suggestion that these assemblages are controlled by oxygen availability, I do not think that this is necessarily the case. Given that many, though admittedly, not all, previous studies have concluded that agglutinated taxa were less able to tolerate oxygen-poor conditions compared to calcareous taxa, it seems to me that we need to look at the global data set for insights into the ecology of these agglutinates. In many oxygen-poor habitats, organic-rich sediments tend to be “soupy,” while under more oxygenated conditions, sediments tend to be coarser and less thixotropic. In soupier sediments, fewer grains would be available for agglutinated tests, and it would be more difficult for an agglutinated individual to remain near the sediment-water interface. This idea coupled with the presence of winnowed sediments (line 15 on page 3258) suggests to me that sediment characteristics might account for the dominance of agglutinates in this region as compared to those from other OMZ regions. Were sediment characteristics measured? The presence of abundant soft-walled taxa in some oxygen-poor environments (lines 20-28, page 3259) is consistent with this hypothesis. To me, the

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dominance of agglutinated taxa and the presence of *H. elegans* in the OMZ study area suggest that sediment characteristics enable these low-O<sub>2</sub> tolerant taxa to thrive in this OMZ habitat compared to other, more typical, oxygen-poor sediments.

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Interactive comment on Biogeosciences Discuss., 12, 3245, 2015.

**BGD**

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