Biogeosciences
Discussions

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Interactive comment on "Macrofaunal colonization across the Indian Margin oxygen minimum zone" *by* L. A. Levin et al.

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Received and published: 29 July 2013

General comments : This paper describes short term colonisation patterns and early carbon processing of deep-sea macrofaunal assemblages along a gradient of oxygen concentrations in the Oxygen Minimum Zone of the Indian margin. The study is within the focus of Biogeosciences and relies on an original combination of short term colonisation and isotopic tracing in situ experiments. The manuscript is well structured and well written. The conclusions are generally well supported by the results though the sample size and level of replication are low, which may question the relevance of some of the stastical tests used (see below).

Specific comments Introduction: The introduction gives a wide overview of colonisation experiments in the deep sea. The objectives and hypotheses regarding colonisation

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patterns in the OMZ of the Indian margin are clearly stated. The isotopic tracing experiment however in not mentioned nor the rational for these measurements, this should be clarify.

Methods and results: The sampling design is nested in transect x depth x treatment but depth is unbalanced among transects and the level of replication for treatments is low (2 replicates). In such a case statistical tests are not advised. In particular ANOSIM tests for the influence of transect and depth may be biased as all samples from transect 1 in the analysis were collected at 800 m while most samples from transect 2 were collected from 1140 m. The influence of the two factors can not be reliably tested. Instead, it might be more relevant to group samples according to oxygen concentration. Furthermore, I don't understand the multidimensional scaling plots. It seems to me that the same 9 trays were used to compute the similarity matrix for plots B to D shown on Figure 7. I thus don't understand why the ordination of the trays is different in these 3 plots.

Discussion: The high colonisation rates reported in this study at 1100 m are unusual for the deep sea. Menot et al. (2009), relying on the mass effect hypothesis, suggested that communities under natural disturbances would show higher colonisation rates driven by opportunistic species able to maintain populations in patchly distributed disturb areas. This may fit with the results of this study although Menot et al.'s experiments were carried out at 1300 and 4000 m depth near the Congo canyon and not in the OMZ as stated in the manuscript (p9470, l.26).

Interactive comment on Biogeosciences Discuss., 10, 9451, 2013.