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# ***Interactive comment on “Structural and functional study of the nematode community from the Indian western continental margin with reference to habitat heterogeneity and oxygen minimum zone” by R. Singh and B. S. Ingole***

**Anonymous Referee #2**

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Review of manuscript submitted to Biogeosciences Discussion: “Structural and functional study of the nematode community from the Indian western continental margin with reference to habitat heterogeneity and oxygen minimum zone Authors: R. Singh & B.S. Ingole

General comments Although OMZs have been well established in ocean regions of western continental margins such as off Africa and the Americas, as well as Arabian Sea, the current understanding of the factors and processes that control meiofaunal, particularly nematode, community structure, diversity and distribution in such environ-

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[Discussion Paper](#)



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ments is still limited, even more at species level. It is known that within the metazoan meiofauna nematodes constitute the numerically dominant taxon in most settings and that they are highly tolerant to hypoxic and nearly anoxic conditions. OMZ sediments challenge the meiobenthos in general and nematodes in particular with stressful conditions that require functional adaptations.

The present manuscript is timely and provides interesting results on nematode community structural and functional diversity along a single bathymetric transect off western India subjected to oxygen and organic matter gradients, as well as substrate heterogeneity. The results are presented in relation to three different environmental zones: shelf, slope and basin, being the near shelf break and more strongly, the slope zone, influenced by the OMZ. At this point, I would ask the authors to be consistent using zones or regions, no both. The determination of functional traits along with identification of nematodes at the lowest taxonomic level contributes to a better understanding of OMZ ecosystem functioning; however, although valuable from the taxonomic point of view, perhaps for functional traits, genus level would be appropriate as several genera have common ecosystem functions. Understanding the structural and distribution patterns of the most abundant group in hypoxic/anoxic environments is crucial in order to understand the possible impact of OMZ expansion on deep-sea ecosystems.

To my view, this is a valuable paper, in general well written although the introduction needs to be shortened focused given more information from previous studies along the Indian margin heading to clear and concise questions. Measuring many things without a question that support those measurements does not contribute to the quality of the work. Stating an overarching hypothesis that guides the work and the discussion would also be very helpful.

The discussion is very descriptive and does not keep focused on discuss their results in relation to functional adaptations, structural diversity patterns and ecological processes relevant to OMZs. In addition, in my opinion, the literature on the topic was not properly revised. Several, relatively recent papers, relevant to this study, as they are either from

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Interactive  
Comment

the same Arabian Sea region or from the eastern Pacific OMZ, primarily focused on nematodes, are not cited, and in my opinion results should be discussed considering them: Sajan et al. 2010 (*Estuar. Coastal Res. Sci.*) Nanajkar et al. 2011 (*Italian J. Zool.*) Annapurna et al. 2012 (*J. Mar. Biol. Ass. of India*) Neira et al. 2013 (DSRI) Guilini et al. 2012 (*Prog. Oceanogr.*) Neira et al. 2001 (*Oceanologica Acta*); 2001 (*Contribution to Zoology*); 2005 (*Cahiers Biol. Mar.*) Muthumbi et al. 1997, 2004 (*Hydrobiologia*); 2011 (*Mar. Ecol.*) Neira & Decraemer 2009 (*Organisms, Diversity & Evol.*) (General on oxygen deficiency over the Indian shelf): Naqvi et al. 2006. Seasonal oxygen deficiency over the Western continental shelf of India. In: Neretin, L.N. (ed.), *Past and present water column anoxia*, Dordrecht, The Netherlands, pp. 195-224.

Another aspect of concern is the sampling. It seems that the sample for meiofauna was based on a single subsample collected from a single drop of a spade box corer, i.e. there is not replication. This appears to be supported by the MDS plots where a dot per station is displayed. Similarly, nothing is mentioned about the fraction depth of the sediment subsampled with the 5.7 cm PVC corer, was the top 1 cm or 5 cm or 10 cm? Please indicate clearly.

Regarding Tables and Figures. I think it would be more relevant for meiofauna ecologists to present densities of nematodes than presence and absence as showed in Table 2. I would suggest to omit or move Table 2 to supplementary material and put in its place a list of nematode with showing mean densities per zones (shelf, slope, basin) and their feeding modes and tail attributes. Table 8: The description of the results of BIOENV for body size and tail shape does not match what is indicated in the discussion page 11550, lines 11-12.

The schematic model (Fig. 7) of all biological traits, being an interesting product of this study is poorly discussed and practically gets lost. Very little is said about the concept behind, implication and applicability to other OMZs. Visually, it could be improved with color.... By the way, text on page 11558, Lines 12 and 20 referred to this figure as

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Interactive Discussion

Discussion Paper



Interactive  
Comment

Fig. 4, not Fig. 7. In the same page 11558 appears for the first time categories such as “eutrophic sites” and “oligotrophic environments”, which are not mentioned and defined before in the manuscript. On page 11548, Line 16-18 said ANOSIM revealed “insignificant” differences; however, significance was 0.021.

To summarize, in general this paper makes a good contribution to meiofaunal ecology of OMZs. However, this MS should be revised and improved in its structural organization, with a clear hypothesis guiding the work and specific questions to be addressed, and considering missing, relatively recent literature relevant to OMZ meiofauna/nematodes.

## Minor comments/edits on Supplement

Please also note the supplement to this comment:

<http://www.biogeosciences-discuss.net/12/C4404/2015/bgd-12-C4404-2015-supplement.pdf>

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