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## ***Interactive comment on “Macrofaunal assemblages from mud volcanoes in the Gulf of Cadiz: abundance, biodiversity and diversity partitioning across spatial scales” by M. R. Cunha et al.***

### **Anonymous Referee #1**

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#### General comments

This concerns a key paper on the macrofaunal communities of the mud volcanoes in the Gulf of Cadiz. It provides some crucial insights in the diversity of the area, considering the influence of geological activity, and water depth. It is well written, though a bit descriptive. Through relatively minor changes in formulating the research questions and focus of introduction and discussion, the readability of the paper will be significantly improved.

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## Specific comments

I believe there is more in the paper than only 'to describe patterns'. By stating that you expect a difference between shallow and deep mud volcanoes for different reasons would already make the paper less descriptive and probably a key paper in cold seep ecology. Some of figures could indeed be used in handbooks when presented in the context of this hypothesis. The analysis and presentation of data are in general correct, relevant and informative.

## Technical comments

Mud volcanoes is sometimes abbreviated, other times not. Deep sea or deep-sea environment Page 2: line 14 change to : the samples yielded modest abundances but the (local or regional???) species richness was among the highest ever recorded Page 5 from line 13. Reformulate objectives in a more hypothesis driven context focusing on differences between shallow and deep MVs Page 6 line 19 remove 'and' just before 'often' Line 20 Change to: the deep MV's showed in general a more heterogeneous macrofauna Line 24 replace approximation by similarity Page 8 line 1: Explain Hermes and Hermione or remove from text (acknowledgements) Page 9 line 1: rather than associating this as a consequence of lack of replicates I would justify this scientifically. However in that case explain a bit better with evidence why 1200 m is transition. Page 10 line 14 phyla and not phyla Pag 10 line 19. The last sentence should go to material and methods Page 11 line 4 I guess this is fig 3 and not fig 2a Line 9. Here it should be Fig 2a Better to be consistent in expressing densities per  $m^2$  or per  $0.25 m^2$  and not mixed (figures per  $0.25 m^2$ , text  $m^2$ ) Pag 12 line 13 Fig 3b not 2b

Page 12 Line 23 Normally an MDS is not interpreted along the axis , since position can be changed by rotating the figure Page 13 line 6 reformulate sentence since not clear what is meant by contrasting features (see also abstract) Line 9 distinct in which way? Line 28 Simper results are characterized rather than determined? Pag 15 line 3 change to weight in explaining Line 23 remove certainly Line 23 Add However, there are very

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few cold seeps. . . . . Pag 19 line 20 What is the evidence for the lower seepage. Can you add references Page 22 line 9 reformulate these two sentences since grammatically not correct Page 22 line 17 what are the outstanding characteristics of the GoC. Here I expected a conclusive overview of the macrofauna features which makes the area different. However some of the paragraphs characterize rather the environmental settings of the area. So some aspects are not conclusions from the paper but provide rather the context and should be incorporated earlier in the discussion (even at the beginning)

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