**Biogeosciences
Discussions**

Interactive comment on "Influence of chemosynthetic ecosystems on nematode community structure and biomass in the deep eastern Mediterranean Sea" *by* N. Lampadariou et al.

Anonymous Referee #2

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General Comments: The manuscript "Influence of chemosynthetic ecosystems on nematode community structure and biomass in the deep eastern Mediterranean Sea" by N. Lampadariou et al. examines patterns of biodiversity of benthic meiofaunal organisms, particularly of nematodes, in a fascinating set of mud volcanoes in the Mediterranean Sea. There are relatively few examples of deep-sea environments where species-level meiofaunal diversity has been generated, and even fewer of chemosynthetic habitats. Meiofauna deep-sea benthic diversity is often neglected because suitable samples are difficult to recover and lack of available meiofaunal taxonomic exper-

tise. Thus for all these reasons this contribution is relevant for the scientific community.

The manuscript is generally well written. The Introduction has adequate background material to cover the topic at hand, while the gaps in knowledge and the objectives of the paper are clearly outlined. However, some crucial information is not provided (see specific remarks below); this fact hampers the evaluation of the presented results and interpretations. Also the sampling strategy is questionable, for the lack of replicates in the control station.

Specific remarks and questions are: 1) The investigated mud volcanoes are the same described by Ritt et al. (2012). By checking the sampling cruise and the coordinate of samples, I guess that the samples investigated in this manuscript come from the same stations of the cited authors (Ritt et al., 2012). If this is the case, the Authors have access to all the chemical characteristics and all the trophic variables for each habitat mentioned in the manuscript. This impressive dataset, and in particular all the environmental parameters relevant for the ecology of the meiofauna, should be adequately taken into account and thoroughly discussed. I also would like to enquire if the Authors have changed the name of the stations from Ritt et al. (2012), and, if so, for what reason.

2)The Authors sampled a control station in an area outside the influence of the mud volcano, but only one core was sampled. In my opinion only one core as a control is not acceptable. I understand the difficulties of sampling in the deep-sea, but I am also aware of the environmental variability, and I think that one core is not ecologically representative. I suggest removing this station from the article.

3)The vertical distribution data of nematodes are not strong enough to support the sentence of the Authors saying that nematodes displayed deeper penetration in the seep areas. The profiles on display are, in the majority of the cases, "normal" nematode deep-sea vertical profiles, with only a sub-superficial peak in the summit location: also in this case, however, the inversion is not marked). I suggest removing this sentence

from the abstract and the discussion.

4)The Authors use the words "habitats" and "microhabitats" as a synonymous. For example in paragraph 2.1 they wrote "In total, ten different microhabitats were sampled five from the Amsterdam and four from the Napoli mud volcano . . ." and few lines below: "The five habitats from the Amsterdam mud volcano were:..". I invite the Authors to firstly define the term "habitat" and "microhabitat" (is there a spatial differentiation?), and then to check carefully all the text in order not to confuse readers.

My general conclusion is that this paper addresses relevant scientific questions within the scope of BG, presenting novel data. However, some crucial information is missing. For this reason, I recommend to accept the manuscript with major revision, in order to allow the Authors to include the missing but essential information. âĂČ Specific Comments:

Abstract The abstract provide a concise and complete summary. However, the vertical distribution data of nematodes are not strong enough to support the conclusion made by the Authors. I would suggest removing this part. Please see general comments

Introduction P18133 line 1 The Authors define cold seeps as "extreme environments occurring in a wide variety of geological settings along both active and passive margins". This definition is too generic, cold seeps differ from other extreme environments because the emission of gases from the seafloor is typically not associated with a significant temperature rise.

P18133 lines7-8 " More recently, seep communities have been also reported in the Mediterranean Sea (Corselli and Basso, 1996)". There are several recent publications that are missing (e.g. Holland et al 2003, - 2006, Camerlenghi and Pini, 2009, Savini et al., 2009, etc..)

P18133 lines19- 21 Please provide a reference for this sentence.

Material and methods P18135 lines 5-13 The question 2 and the question 4 are similar

and it is better combine both in a unique question.

P18135 lines 18 and 21 The definition of habitat and microhabitat needs attention. See general comments.

P18137 lines 5-7 Only one core cannot be considered a control. See general comments.

P18138 lines 14-17 "As soon as the cores were retrieved, the overlying water was filtered through a 32 μm mesh size sieve and the material retained on the sieve was backwashed into the plastic containers where samples were stored for later laboratory analysis." Where are these data?

P18138 lines 24-25 "..nematodes from each of the remaining sections were randomly picked out, mounted on glycerine slides and identified to species level" Have the Authors mounted nematodes directly on slides without follow a formalin–ethanol–glycerol treatment? Mounting directly nematodes on slides could be problematic for species identification.

Resultats P18140 Line 7 ". . .and the lowest at the Lamellibrachia field of Napoli (8 taxa) and the control station (9 taxa)." In table 2, 9 taxa are also reported in the Reduced Sediment of the Amsterdam.

P18140 Lines 8-12 I suggest the Authors to add a table reporting taxa presence/absence in the different habitats.

P18140 Lines 13-17 Please add the samples referred to the data showed.

P18140 Line 17 "All other taxa, including both permanent and temporal meiofauna, contributed less than 1% (Table 2)." The list of other taxa is missing.

P18140 Line 27 I recommend the authors to add a table with the statistical results. For each ANOVA, F ratio and df should be shown.

P18141 Lines 15 and 19 The authors wrote: ". . .the genus Sabatieria was represented

by a complex of three species".. and then authors describe Sabatieria sp. 4. Please check and correct it.

Discussion P18144 p 4.1 Please see general comments about environmental data

P18144 p 4.2 Please see general comments about vertical distribution

P18144 line 2 Have you data below the 5 cm? Where are they?

P18146 lines 6-8 "Another striking feature of the control station was the fact that the genus Manganonema, a genus that is found only rarely and in very low numbers (Zeppilli et al., 2011b), was ranked second." This is not true, looking in table 3 we can observe that Aponema is first with 12.9%, Thalassomonhystera is second with 11.9% and Manganonema is third with 6.2%.

P18147 lines 22-29 and P18148 lines 1-10 Please see general comments about vertical distribution

P18148 lines 28-29 Syntax error: remove ambient

P18150 lines 1-2 ".. beta diversity has been widely neglected in the marine environment, particularly in meiobenthic studies (Sevastou et al., 2011)." This is not true, there are several studies on beta diversity of meiofaunal community (e.g. Danovaro et al 2010, VanGaever et al 2010, Leduc et al 2012, etc...)

P18152 lines 2-4 "In addition, many of the other putative species identified from the reduced samples appear to be new, suggesting possible endemism to seep environments at the species level." How many species are new to science? Could you give a percentage?

P18153 line 3 Syntax error: substrata

Table 1 Here the coordinates are expressed in decimals of minutes, while in the figure 1 they are expressed in minutes and seconds. Please use the same conversion.

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Table 2 Please add a list of the group "other taxa" The column with the number of taxa could be removed from the percentage table, it is confusing.

Figure 1 Please add N and E to the coordinate. Please see comments on table 1 about minutes/seconds conversion

Figure 4 Please see general comments

Figure 5 Why have you not transformed the nematode species matrix?