Biogeosciences

Discussions

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Interactive comment on "Structure and functioning of epipelagic mesozooplankton and response to dust events during the spring PEACETIME cruisein the Mediterranean Sea" *by* Guillermo Feliú et al.

Anonymous Referee #2

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The manuscript presents a complete set of multidisciplinary data of zooplankton community structure and functioning from an oceanographic cruise in the Western Mediterranean Sea in late spring-early summer (May to June 2017) during two major dust events in the Algerian and Tyrrhenian basins. Investigating mesozooplankton structure in the western Mediterranean Sea is a classic but necessary marine science research approach to improve our knowledge on the mesozooplankton community and estimate the responses of this key trophic group in the pelagic ecosystem linking small primary and secondary producers to higher nektonic trophic levels. Furthermore

this study significantly contributes on the effect of the Saharan dust deposition on the zooplankton community structure. Several papers have been produced in the scientific world and at the Mediterranean Sea level, dealing with mesozooplankton composition, distribution and structure. Nevertheless, this study pushes the analysis deeper up to mesozooplankton functioning and estimate zooplankton growth, ingestion and metabolism using allometric relationships. This paper is very well written and organized, but a clear scientific question or at least two hypotheses should appear in the introduction instead of a description of the objectives as general scientific tasks. For instance what do you expect during the Sahara dust deposition, what should be the effect of the Sahara dust to the zooplankton community and how your data can show this influence. Also, the major part of the discussion is mainly based on regional differences and comparisons and less discussion has been made on the effect of Sahara dust on zooplankton estimated vital rates. Are there any differences of the vital rates before and after the Sahara dust events? What is the response of the zooplankton community after the Sahara dust deposition besides the changes in community structure? Please find below the detailed comments on the manuscript. Line 47: Add also the reference Siokou et al., 2019.(Deep-Sea Research Part II 164 (2019) 170–189). Line 58: Explain better why this cruise should be "flexible". The manuscript Guieu et al., 2020 has not been published so it is difficult to understand the design of the oceanographic cruise. Line 60: Add also the main questions and hypotheses of this study. Line 80: Explain why did you calculate the depth of the Mixed Layer. In this study there is no information at all about the hydrology of the area so it is difficult to follow. Only at the end in the discussion chapter the authors clarified the hydrological features existing in the area. Lines 85-86: Explain why do you perform the zooplankton sampling from the surface until 300 m? Is it due to the euphotic zone? Is it due to the hydrological features of the area? Line 140: Explain what negative and positive values of the NBSS slopes means. Line 153: Explain why did you use the conversion factor of C:Chla=50 and add the reference. For oligorophic waters are more suitable to use the conversion factor/equation of Malone et al 1993, which

is used the different Chla values according to depth. Line 157: Add equation model for ammonium, phosphorus excretion and oxygen consumption rates as you did with the other relationships. Line 200: Throughout the text, there are several definitions for the small zooplankton, sometimes<1mm, <300, <500 μm. Please clarify in order to avoid any confusion. Line 221: you wrote "due to higher relative abundance of small copepods" please specify what species and which size. Also ostracods are not copepod species. Pontellidae family is written twice, and some species in Pontellidae are not small. Please specify if possible which species. Line 225-229. The explanation for the strong variations of the NBSS that is due to the migration of the larger species is not very clear, According to the Fig.4 the abundances of large species are quite similar between day and night sampling. Unless, you will approve that there is statistical significant differences between the night and day samples. Line 234: Clausocalanus and Oithona species according to the literature are not herbivorous species. Line 253: Add in your Methods how or who did the Primary Production measurements. Line 316: Specify the hydrological features of the area. A short chapter for the study area could be very helpful. Line 370: In methodology you wrote that the contribution to nutrient regeneration by zooplankton was estimated using the values of primary production and converted to nitrogen and phosphorus requirement using Redfield ratio. However, the calculation doesn't follow the Redfield ratio of C:N:P = 106:16:1. Have you used this, or did you use the ratio that you found during the study? Please clarify. Line 340-375: In this chapter the authors are reported several times the different vital rates of the zooplankton size fractions. However, these data are not provided in Table 2. I could be useful to add biomass data of the total zooplankton as well as of the different size fraction in the Table 2. Line 392: Delete "species composition" since no data is shown in Table 2. Line 410: Please add also the taxa that correspond to each stage of succession. Lines 417-420: Explain how do you know that at the beginning you had small phytoplankton and then large? Because, according to Line 396 (pers. comm. J. Uitz), size and species composition of the phytoplankton community in FAST did not show any change after the dust. Lines 410-425: This

paragraph could be the main hypothesis of your study. Table 1: Add information about the dust events to follow better in the text. Table 2: Add biomass data of total zoo-plankton and size fractions. Table 3: Add Siokou et al., 2019 and make the comparison.

Please also note the supplement to this comment:
https://www.biogeosciences-discuss.net/bg-2020-126/bg-2020-126-RC2-supplement.pdf

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