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# ***Interactive comment on “Microbial food web dynamics in response to a Saharan dust event: results from a mesocosm study in the oligotrophic Mediterranean Sea” by E. Pulido-Villena et al.***

## **Anonymous Referee #1**

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Revision of the ms entitled: “Microbial food web dynamics in response to a Saharan dust event: results from a mesocosm study in the oligotrophic Mediterranean Sea” by Pulido-Villena et al.

## General considerations

In the present study authors try to elucidate the effect of Saharan dust deposition on the different components of the microbial food webs including viruses on an oligotrophic system, using an experimental mesocosms approach. Authors are mainly centered in the plausible contribution of N and DIP transported by the Sahara dust on the activity

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and biomass of marine microbes in the surface of the water column (0, 5 and 10 m). The ms is well written, tables and figures almost always illustrate correctly the results, however, I found that authors need to explicitly explain that this is an experimental approach and cannot extrapolate what occurs in Nature. Authors added a determined concentration of Sahara dust that will not be as diluted as occurred in the open Sea. For this reason it is not clear to me when authors say that they added a concentration of 41 g of mineral dust mimicking a realistic flux of 10 g m<sup>-2</sup>. The question is how realistic is this addition?, in nature how often during the year occurs this Saharan dust deposition? Really, authors did a quite amount of work measuring microbial biomasses, diversity and activities, although sometimes basic measurements, that would be very nice to have it in the ms as chlorophyll a and NO<sub>3</sub><sup>-</sup> concentrations are not shown because presumably are in Ridame et al. (2013), but I could not found it.

### Specific questions

#### Introduction

Page 340, Line 24, Boras et al. (2009, 2010), in the bibliography are referenced after Brussaard. They should go before.

Page 340, Line 25, Vaqué et al. (1994) is in the text but not in the reference list.

Page 342, Line 12, "...in the form of strong pulses" What it means strong?. It is true that you add a couple of references, but it would be nice for the reader to know that, without (at this moment) to go to these references. Also as I said before authors could add how often these events occur.

#### Material and Methods

Page 342, Line 9. Once you add the dust did you calculate the time that this will arrive to the whole 15 m?. Question: Why do you decide to make the second seeding after 7 days?

Page 343, Line 10. Did you take, duplicate or triplicate subsamples for bacteria, or

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duplicate subsamples for each mesocosms?

Page 344, Line 11. “Two virus groups (V1 and V2) could be discriminated...” What these two groups of viruses do they represent? Are they presumably bacteriophages and viruses of other microorganisms?. In addition they are not used in results and discussion, authors use them as total VA, then it is not necessary to talk about this distinction if these two classes are not used afterwards. By the way, could you discriminate other higher classes as V3 or V4, as high or very high viruses?

## Results

Page 347, Lines 20-24. Authors talk about the nitrate evolution after the first and the second seeding and are referred in Ridame et al. (2013, this issue). First, if I am not wrong looking at Ridame et al, (2013), I could not find the dynamics of Nitrate, It would be nice whether authors would add it in their study. Second, this reference it is not in the bibliography of the present ms.

Page 348, Line 10. DIP concentration after the second seeding (Fig. 1). Authors have any hint for this high variability of DIP among D-mesocosms? It is true that DIP concentration averages for D-mesocosms are higher than for C-mesocosms, however the very large errors bars at least for the surface waters prevent for making reliable interpretations.

Page 349, Figs 4a and 4b. These two figures are difficult to follow. I tried to understand looking at the figures when you say: After 4 days, the relative abundance of 4 OTUs was significantly higher in D-than in the C-mesocosms, and the relative abundance of 8 OTUs was significantly lower in the D- than in the C-mesocosms. I did not succeed. Neither, the legend of both figures help very much

## Discussion

Page 351, Line 1: Ridame et al (2013b) is not in the reference list. This is the same reference than the one before in page 347, Line 23? The other one does not have any

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indication if is a or b or the same.

Page 353, Lines 4-8. Authors say that a plausible explanation why bacteria are not utilizing DIP in the second seeding is due to the release of DOM from phytoplankton. I think that probably bacterial lyses or phytoplankton lyses could contribute to the pool of these nutrients plus dissolved organic carbon, and maintain the high respiration. By the way it would have been nice to have also BP for having a more complete picture of bacterial activity.

Page 354. Comment: The reasoning of the authors when referring to the impact of viruses and HNF on BA is logical. However, although seems that viruses activity are enhanced in the second seeding, the decline of bacteria could also be caused together by lyses and bacterivory, although authors did not found a clear evidence of that because they (HNF) do not increase, and it is not different in both C and D-mesocosms. The heterotrophic nanoflagellate abundance observed is the result of their growth and the predation on them by other microorganisms as ciliates or other heterotrophic nanoflagellate larger than them (cascade effect, Sher and Sher 2002). I love the discussion part about the hypothetical different reasons as bacterial lyses as well as lysogeny, why bacterial abundance declined in the second seeding, it was a pity that authors did not have measurements of that, because you would had a good scenario to test this hypothesis.

Finally, I did not go trough all references, just I detected few that were not in the list or were in the wrong place. Just check all of them to make sure that are OK

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