Biogeosciences Discussions

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Comment on bg-2021-20

Anonymous Referee #3

Referee comment on "Impact of dust addition on the metabolism of Mediterranean plankton communities and carbon export under present and future conditions of pH and temperature" by Frédéric Gazeau et al., Biogeosciences Discuss., https://doi.org/10.5194/bg-2021-20-RC3, 2021

In this manuscript, Gazeau and colleagues present a significant work about metabolism adaptation of Mediterranean phytoplankton to dust fertilization, under present conditions and in an acidified future ocean enriched in CO2, with a substantial very new data set. They also provide new insights about particles export in this context, that are a precious contribution for modeling. The paper is well organized, but quite long with a lot of concepts that make it a little bit hard to follow. It does not help to clear the main ideas and conclusions easily. The paper is recommended for publication, also minor changes should be considered before this, that are listed below.

First, a table of the abbreviations would be very helpful.

L57 and 59: more recent references are needed

L59: same sentence as in the abstract. Not a problem but not very elegant.

L76: if I understand correctly the metabolic balance is not enough to draw conclusions about the biological pump, the NCP can only provide information about surface water, not about what happen at greater depth, therefore you can't really constrain the efficiency of the export from this only.

L80: Please add more general references. This is two very local studies.

L136: it would be great to have a quick summary of the paper

L158: when were the las dust events in the three areas?

L168: please do a quick summary of the experiment: why these concentrations, what is the composition of the dust? Does it reflect a pure lithogenic input, does it have an anthropogenic component?

L201: what is the percent of agreement between the replicates? Did you do some blanks?

L213: Same as above for TCHO, percentage of agreement between replicates and blanks?

L215: how did you choose the different times of sampling for the different parameters and following which criteria did you chose to end the experiment?

L225: Does the measures of the two filters agree? Did you do several measures on the same filter? What does the blank represent compared to the samples?

L239: "compared to" instead of "then" I think

L254: did you do some blanks and replicates? What is the standard deviation associated to the measurement?

L282: same as the precedent comment

L301: according to your first definition it's an addition not a difference

L343: Have you measured Na to check if the salt was correctly removed and does not contribute significantly to the weight?

L345 to 356: please quantify the blanks, agreement between replicates and the standard deviation

L356 to 358: please provide the references those ratios come from

L598: it would help to have a graph of comparison in the supplementary

L631: it would be better to do a citation, it is well-known that dust events provide Al

L808: maybe add a quick summary

L784: you can cite studies on the ballast effect, of P. Lam for example

L894: you could highlight better how useful your work can be for modeling

L1282: Please add the dates of the cruise in the caption, the latitude and longitude on the map, the color bar for the bathymetry you represent. Enlarge the numbers of the station, as your study is part of a larger work it will help to compare with other publications.

The other figures are tiny and hard to read, except figures 5 and 8. Please enlarge the titles of the axis, especially the time. When you have several panel (in figure 4 or 6 for example), it would be better with letters for the different panels

If not included in the points and if possible include the error bars on figures 2,3,5,7,8.