

Interactive comment on “Autotrophic and heterotrophic metabolism of microbial planktonic communities in an oligotrophic coastal marine ecosystem: seasonal dynamics and episodic events” by O. Bonilla-Findji et al.

Anonymous Referee #1

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Comments

This manuscript presents interesting seasonal data of planktonic metabolism in the Western Mediterranean Sea, at one station. The yearly evaluation of the planktonic metabolism month by month is rare in published reports but essential and important to understand how the planktonic communities maintain and control their metabolic processes through the seasons and through the years. However, there are some general aspects that could improve the manuscript.

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1. In general, there is a considerable lack of statistics along the results and discussion that could allow to strengthen the interpretation of the results.
2. There is also a lack of references along the Introduction and the discussion.
3. A general description of the sampling location is missing: water masses, current, blooms?, ... etc.
4. In the discussion, the part treating on the impact of the forest fire dust and Sahara dust on the planktonic communities were interesting and I think that need to be improve (how the dust were quantified? How did you differentiate dust from Sahara and others?).

Specific comments:

Introduction:

P2035, L20-24: Please, add some references

P2035, L20: “in temperate systems, a spring bloom is a typically followed by ...” in general? For Coastal ecosystems? Open ocean? Please, precise.

P2036, L1-3: Please, add some references (e.g. Dachs et al, 2005)

Methods:

Study site and sample collection

In my opinion, a section treating about the description of the sampled location “Point B” is missing (environmental properties, biological activities, current, water masses...), especially considering that this “Point B” is well studied.

P2036, L18-19: How often did you sample during phytoplankton blooms and specific events?

P2036, L20: Why didn’t you measure the metabolic rates (GPP, CR and NCP) during those events? It could have been interesting to have those data and compared it with the other measurements. Nutrients dissolved organic carbon particles and Chl a

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P2037, L5: Please, precise if the TOC, DOC, Chl a and nutrients were measured for each sampled depth or more?

Bacterial and planktonic community metabolism

P2038, L10-13: Don't you think that a filtration process may affect the bacterial community and so, its metabolism? Do you think that another method could be better to use to measure the bacterial respiration without affecting the community by a prefiltration?

Results

P2039, L15-16: How did you evaluate the depth of the mixed layer? Could you please, give us the mean \pm SE of the mixed layer depth, globally and for each season?

P2039, L18-19: What was the depth of the thermocline during the winter?

P2039, L22: Please, make the figure larger.

P2040, L2-3: Are you talking about daily precipitation? Please precise.

P2040, L10-15: Did you try to collect the dust? If yes, please explain in the methods section the protocol and in the results section, the analysis of the dust collected.

P2040, L17-24: Statistical tests are missing here. Please compare statistically your data.

P2040, L24: Please, add in the figure caption the units of each parameter.

P2040, L23-24: How can you explain that the nitrate is not affected by the bloom and by the dust inputs?

P2041, L13: Please precise the year of the second peak observed in fall.

P2041, L14-16: Please precise the year.

P2041, L19-21: "... but values were typically also low in summer and in autumn." Please, precise if it was in general low in summer and in autumn or just in 2004.

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P2041, L22: "the time and depth integrated" if it is depth and time integrated, the unit of the metabolic rates should be mol O₂ m⁻² d⁻¹ and not μ mol O₂ l⁻¹ d⁻¹.

P2041, L23: "clearly lower", significantly? Please compare with statistical test and precise it in the text.

P2042, L5-L20: I am confused about the term that you used as "integrated". L5 "the integrated R..." ... integrated to what? Depth? L8, you talked about "depth-integrated" here it's clear. How did you calculate the depth-integrated metabolic rates? Please add a line in the method's section about it, and if the term "integrated" in L5 did not treat about depth-integrated, please, precise it and explain it in the method's section.

P2042, L5-7: "...when it exceeded up to 7 times ..." does its significantly different? Please precise it using statistical test. Please add to your values their corresponding SE.

P2042, L9: The figure cited here doesn't correspond.

P2042, L14-15: The figure cited here doesn't correspond, I think you referred to the Fig. 7 a, and not b, no? Please add the equation of the regression in the graph or in the caption corresponding and precise on the caption the regression model that you used for.

P2042, L18-20: Did you evaluate the threshold of integrated GPP? Please determine it. What did you mean when you said, "... exceeding by 2.4 times the average measured GPP"? What is your explanation to this observation?

P2042, L22: Bacterial abundance has as unit cell ml⁻¹, no?, please correct it.

P2043, L1, L6-7, L10-11: Significantly higher? Please precise it.

P2043, L7-9: How can you explain that only BP changed with the dust? What is your explanation about the lack of effect of the dust on the BR, BA and other biologic parameters?

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P2043, L24: "... at all depth" it is not true, look the figure, at 20 m depth. Please correct it, or correct the month (March, no?)

P2044, L6: "BR decreased and BP increased with BGE", it was expected no, as BGE depends on BR and BP?

P2044, L10: "GGP", you mean GPP, no? GPP increased with R increasing, it is expected no? What other interpretation could you give to this observation? (slope)

Discussion

P2044, L13: "GPP, CR, BR and BR..." you mean BP, no?

P2045, L3-4: "total DOC" did you measure it with ^{14}C ?

P2045, L17: Please give a reference of the threshold GPP of the global ocean.

P2045, L25: "horizontal gradient" did you mean "vertical gradient"?

P2046, L13: "in the the bay..." please correct it

P2046, L12-14: Did you observe a P/R ratio positive during the upwelling or/and during fires?

P2047, L5, L10-11, L14: Please add some references

P2048, L19: You talked about the light limitation on phytoplankton, please discuss more.

Figure 1 "Irradiance", PAR irradiance, PAR+UV irradiance? Please precise it. Oct, Nov and Dec 2002 data are missing no? How can you explain that the irradiance in April 2003 is twice higher than in 2004?

Figure 2 Please make it larger.

Figure 3 Please correct "No", write Nb or N° .

Figure 4 Please add error bars. How can you explain a $\text{GPP} < 0$? It is not possible!

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The y-axis title is not clear, stimulation of what? Fire? Please change it.

Figure 5 Please change on the legend of the figures "January" or "February" by "Sahara dust event" "No Sahara..." or other. The unit of bacterial abundance in cell ml^{-1} , no?

Figure 7 GPP:P (a) represent the ratio of the volumetric values or depth-integrated? Please precise. Please add the regression equation in the figure or in the caption.

Figure 8 Please add units of BA

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