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Interactive comment on “Vertical partitioning of phosphate uptake among picoplankton groups in the P-depleted Mediterranean Sea” by A. Talarmin et al.

Anonymous Referee #3

Received and published: 9 November 2014

The authors present an interesting manuscript assessing the relative contribution of groups of picoplankton to Pi uptake in the Mediterranean. They also measured Pi uptake kinetic constants per picoplankton group.

In general, the manuscript is well written except for a few sentences that need to be rewritten. However, the discussion would benefit from some additional work. My main concern is that this paper is very descriptive and that there are only a few data to support the author's conclusions, especially for the Pi uptake kinetic constants. Yet the data presented are unique and will be useful to the scientific community. I have a few comments, which the authors might wish to consider in revising the manuscript.

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General comments:

1. You state that the Mediterranean Sea is P-deficient, implying that cells were P-limited while in fact the data presented in Figure 5 clearly show that most groups were taking up Pi at saturating concentration. Instead, I suggest using the term low-Pi, which only refers to Pi concentrations and not to the physiological state of microorganisms. Please consider this aspects in the discussion and conclusion.

2. Concentration bioassays: how did you calculate K_{+Sn} for HProk and Proc since on Fig. 5 it appears to be impossible (i.e. no dose response)? I think that this is a critical aspect of this paper and the authors need clarify their approach and results.

3. I find puzzling that the bulk and the group specific kinetic constants could only be measured at St. A where the turnover times of Pi were the longest: how do the authors explain that?

Specific comments:

1. P14642 L9-10: I would remove “as shown by. . .since 2007” since there are a few missing references and this does not add to the point made.

2. P14642 L21: “Pi-depleted surface waters”: do you mean euphotic layer as in the method section? To me surface is the top 5-10 m but not down to 200m. Maybe you mean upper water column?

3. P14644 L27-28: this sentence is not grammatically correct

4. P14645 L3: I would remove “embarked” and say “The radioactivity was counted onboard. . .”

5. P14645 L10-11: justify why you chose to conduct concentration kinetic experiments at 15m above the DCM: that sounds random to me.

6. P14647 L6-7: you say that because the integrated chlorophyll concentration decreases west to east that “emphasize” the strong Pi-deficiency: I don’t see why. Im-

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prove or remove.

7. P14647 L15-16: I would replace “extreme values” by ranges
8. P14647 L19: “below 50m”: you mean above?
9. P14648 L5 and 10: please give average +/-SD and n values
10. P14648 L20: “not significant”: I would say “below the detection limit of our method”
11. P14649 L1: “higher than for other groups” but I still cannot understand how you could measure K+Sn for other groups than Syn
12. P14650 L9-10: this sentence needs to be rewritten.
13. P14651 L14: “bulk community were 2 to 40 times higher”: Does that mean that larger phytoplankton and aggregates missed in the cell sorting group-analyses present higher Vmax than the small cell groups studied here?
14. P14652 L9: I would replace “detected” by “measured”
15. The last paragraph of the discussion just throws ideas: the authors should develop those ideas or remove this paragraph which does not bring much to the paper at this stage.
16. Conclusion: avoid making conclusions based on the half saturation constant if this parameter could not be properly measured. I would also avoid concluding about bacteria carbon limitation unless there are any data to prove this. Finally, the term “biodiversity” is out of place in the last sentence.

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