

Interactive comment on “Biogeochemical and biological impacts of diazotroph blooms in a Low Nutrient Low Chlorophyll ecosystem: synthesis from the VAHINE mesocosm experiment (New Caledonia)” by S. Bonnet et al.

Anonymous Referee #2

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Biogeochemical and biological impacts of diazotroph blooms in a Low Nutrient Low Chlorophyll ecosystem: synthesis from the VAHINE mesocosm experiment (New Caledonia)

Sophie Bonnet et al.

This manuscript provides a generally well written summary of the VAHINE mesocosm experiment which informs on current interests in the contribution of diazotrophs to carbon export and their support of other microbial communities and higher trophic levels through the production of bioavailable nitrogen. My suggestions are mostly confined

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to the presentation of the written work. There are a number of occasions where the language used is a little clumsy and I have made some suggested edits. As currently written the manuscript assumes a reasonable amount of prior knowledge of the subject area and of this experiment in particular. I would advise better definition of terms and referencing of other papers which support this synthesis – a number of which I have highlighted.

P2L11, P7L28 my experience suggests that mesocosms do disturb the ambient light field. Please provide evidence to the contrary or reference to the relevant paper in the special issue to support this.

P3L12 tropical LNLC ecosystems include . . .subtropical gyres? Tropical and subtropical are different environments/regimes

P3L22 need an extra) after 2008))

P3L29cycles HAS been

P3L32 preferentially exported directly

P5L12 phytoplankton. Actual Calculations of DDN transfer were first

P5L21 . . .poorly and challenged qualified due mainly to

P9L4 ..good replicability low variability

P9L18 within MESOCOSMS and in

P11L2 How is DIP turn-over time defined and measured. I do not see any reference to DIP uptake rates. This needs some detail or referencing to the appropriate paper.

P11 A number of rate measurements are introduced on this page which do not seem to be defined (e.g. APA, PP, BP) neither is there reference to the papers containing this data/description.

P12L5-8 How do your results demonstrate this? No evidence is given here neither is

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there any reference to the paper detailing this work.

P12L28-29to determine whetherof particulate matter, and if so, how was this manifested.

P12L34 equalled

P13L27 what is nanosims and how was it used to demonstrate this?

P14L2 define e-ratio

P14L28-32 long sentence which needs breaking up

P15L1 Are waters contained within a mesocosm natural?

P15L23 Surely the evidence to date indicates that the bubble method underestimates rates? (Mohr et al, Grosskopf et al, etc)

P16L22-27 long sentence

P17L10-15 long sentence

P18L10-13 Whilst *Trichodesmium* is not a particular focus of this manuscript, the finding that copepods are potentially selectively feeding on *Tricho* warrants further investigation.

P19L5 deconvolute???? No idea what is meant by this

P19L15-16 .. during the first 10 days ...

P19L31-32 (nearly up to 40% of the DDNexperiment is found ...)

P20L12 DDN was mainly transferred through ...

Figs 6,7,8 Labelling of REF and NOFIX in figure legends is the wrong way round

P22L9-10 aggregation processes mediated diazotrophs-derived TEP release – this needs re-phrasing somehow

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P23L26 what is PCD?

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