

Interactive comment on “Dynamics of transparent exopolymer particles (TEP) during the VAHINE mesocosm experiment in the New Caledonia lagoon” by I. Berman-Frank et al.

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Reviewer 2 1. Looking at Fig.1, it seems that the only major difference between the mesocosms and the surrounding water is the spike in TEP concentration inside mesocosms immediately after the P addition. The other trends seem to be similar. Any idea why?

Author: This has been described in section 3.1.1 . The difference between the TEP in the mesocosms and the lagoon water is hard to see and is significantly different immediately after P addition and only during P1 after P addition and subsequent utilization when declining P availability was correlated with increased TEP concentrations. The decline in TEP concentrations from the lagoon water during P1 was not statistically sig-

nificant as demonstrated in the mesocosms (Fig. 1, Fig. S1). The significant decline in TEP in the first days after P addition is probably due to two factors: a) phytoplankton relieved of P stress will produce less TEP and increase growth rates, b) bacteria will utilize the added P as well as TEP and other organic C sources to grow – so higher TEP consumption and therefore a more significant decline in the mesos compared to the lagoon.

- 2. Did the authors check whether the optical absorption method using the Alcian blue dye staining to determine TEP concentration is linear? Was the filter absorption measured using the integrating sphere? If not, was there any significant scattering?
Author: TEP concentrations are determined from an Alcian blue (AB) calibration curve done. AB was calibrated using different volumes of purified polysaccharide GX and
- The absorption measured was done with a spectrophotometer (Cary 100) equipped with an integrated sphere.

3. Do the authors have control data from the lagoon outside the mesocosms to be added into Figs.3-6?

Author: Control data for figures 3-5 are available in supplementary figures we show here (in the supplementary pdf). As none of them had any significant correlation we decided not to show them but only state this in the text. For Fig 6 no data exists of DDA growth rates in the lagoon (control) water. We have also added all the statistics we performed for the control (out) versus the parameters tested for the mesocosms in the revised supplementary Table S2 (attached here in supplemental pdf)

4. Any idea why was TOC significantly higher in M3? Why TEP did not increase proportionally?

Author: M3 had higher biomass both PP and bacterial which enriched TOC (Berthelot et al. 2015) and a full discussion on the replicability and variability of the mesocosms can be found in the introductory paper to the project (Bonnet et al. 2016). Why TEP did not increase proportionally is a good question – although when we look at fig 5 we

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can see a similar slope of BP to TEP concentration but shifted to higher production levels of BP that were found in M3. The higher BP possibly indicates a greater extent of utilization of TEP and organic C so that the resulting concentrations which we measured did not significantly change.

BGD

Please also note the supplement to this comment:

<http://www.biogeosciences-discuss.net/bg-2015-612/bg-2015-612-AC2-supplement.pdf>

Interactive comment

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