

Interactive comment on “Distribution and bacterial availability of dissolved neutral sugars in the South East Pacific” by R. Sempéré et al.

R. Sempéré et al.

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1) General comments

We agree with this comment and we included statistical analyses in the results and the material and methods section. We used the Mann-Whitney (non parametric) test from StatView 5.0 to compare:

(1) TDNS concentrations between stations. The results did not show any significant differences. Therefore, we slightly modified a sentence in the abstract: we replaced “... were higher in UPW (149–329 nM) and MAR (111–540 nM), than in GYR (79–390 nM) and EGY (58–492 nM).” by “... were in the same order of magnitude in MAR (387 ± 293 nM), GYR (210 ± 120 nM), EGY (312 ± 158 nM), and UPW (247 ± 68 nM), with the highest and lowest concentrations found in MAR (30 m, 834 nM) and GYR (40

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m, 50 nM), respectively.” (see page 2, lines 25-27 in the revised MS). We also modified a sentence in the summary-conclusion: we replaced “. . . with relatively elevated concentrations in the center of the SPG (GYR) and to a lesser extent in the eastern border of the SPG (EGY).” by “Although distributions were very large along vertical profiles, maximum values were reached at stations of intermediary trophic status like MAR and EGY, but not the more eutrophic (UPW) (page 15, lines 357-359).

(2) TDNS yields between stations. We found that TDNS yields in MAR were significantly higher than those in other stations (see page 11, line 263 in the revised MS).

(3) Dark and full sun treatments in the DOM-photodegradation and -biodegradation experiments. This statistical analysis confirmed our conclusions about the effects of photodegradation on bacterial activities at the different sites (see Fig. 5 and page 14).

(4) We also applied multivariate analysis for sugars (principal component analysis PCA) to differentiate the different sites of sampling based on their sugar composition. However, the results did not show any significant differences.

The observed coupling between primary and bacterial productions and high turnover of

labile DOM in the Chile upwelling should be discussed with other data from the literature,

e.g. from Simon and Rosenstock (2007, Limnol. Oceanogr., vol. 52, p. 85-95).

This is an interesting comment. However, we cannot compare our data with those of Simon and Rosenstock (2007) because we did not measure neither dissolved free amino acids (DFAA) nor dissolved proteins as these author did and therefore, we cannot have an overall idea about all the labile components of DOM. In addition, we did not use labeled sugar isotope to estimate sugar turnover like they did. The attempt to correlate BP with TDNS stock or yields gave no statistical results. The better correlation was obtained between TDNS and leucine incorporation rate at MAR site ($r=0.65$).

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However, this relation was not statistically significant.

2) Specific comments

Page 731, line 23-25: Rephrase the sentence to make it comprehensible.

This sentence was rephrased as follows: The experimental error was calculated as half the difference between two duplicates and averaged 6% of BP rates (see page 8, lines 174-176 in the revised MS).

Page 734, line 23: Please describe briefly the possibility of a terrestrial influence in this area.

In the MS, we added the sentences “Indeed, Signorini et al. (1999) reported the importance of the Marquesas Island mass effect in the stimulation of PP up to 1000 km downstream from the island”. This island mass effect was due in part by the input of waters originating from land drainage.” (page 11, lines 264-266).

Table 1: Include the total depth at the different sampling sites.

We added this information in the text (page 4, lines 88-89).

Fig. 1: ... upwelling off Chile (UPW) (indicated with a star). I cannot find any stars in this figure.

We deleted “(indicated with a star)” from the figure caption.

Fig. 5: In statistics standard deviations are only allowed if you have at least triplicates.

As indicated above, Figure 5 was made again taking into account the statistics.

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