

Interactive
Comment

***Interactive comment on* “Distribution of micro-organisms along a transect in the South-East Pacific Ocean (BIOSOPE cruise) from epifluorescence microscopy” by S. Masquelier and D. Vaultot**

Anonymous Referee #1

Received and published: 12 September 2007

General comments

This paper reports some very interesting data set of several different types of micro-organisms along a transect in the South-East Pacific Ocean that across a variety of trophic conditions, from the hyper-oligotrophic South-East Pacific gyre to the eutrophic Chile upwelling. It will be very valuable and important to compare the microbial food web structure under different environmental conditions and its implication to oceanic primary production and carbon cycling. However, there are some serious problems in methodology, and the authors admitted that in their articles. First of all, using 0.8 μm

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Discussion Paper

filter will cause the loss of the majority of *Prochlorococcus* and *Synechococcus*. Therefore, the conclusion that up to 50% of picocyanobacteria is in the form of colonies is a dramatic overstate. Second, long storage of slides (>1 year) will cause cell loss and fluorescence reduction, especially if the slides have been thawed during transportation. Furthermore, according to what is said in the method and materials, dinoflagellate and ciliate concentrations were as low as 1.5 cell per liter. Given that only 100 ml were filtered and 50 fields were counted using 100x objectives, it is likely that only a few cells of dinoflagellates and ciliates were counted, which is insufficient. Also, ciliates are likely severely underestimated as it is not fixed by Lugol's solution. Based on the above reason, I believe the quality and reliability of the data is compromised. In fact, the authors were aware of most of the points I have raised and discussed them in the paper.

Specific comments

Page 2669, line 8: Actually nanoflagellates are the most important grazer of picoplankton (e.g., Christaki et al. 2001, 2002, Guillou et al. 2001).

Page 2671, line 22: how can DAPI staining separate prokaryotes and eukaryotes?

Page 2673, line 5: what is the rationale to only test the correlation for eukaryotes below 40-60 m? Also throughout the manuscript, "picocyanobacteria" is used in many places, but it really means "PE containing picocyanobacteria" as *Prochlorococcus* is not included.

Page 2674, line 13-14 stated that heterotrophic eukaryotes accounted for quite high percentage of total eukaryotes cells, but on line one of the same pages it is stated that autotrophic cells were much more abundant than the heterotrophic ones. This appears to be contradictory.

Page 2678, line 15-18: Are you talking about the contribution of >20 μm dino to total dino or to total eukaryotes? If it is the former, the numbers (<1 to 2%) are extremely low.

Fig. 5 caption did not indicate what the circles and squares represent.

Several typos: P2678, line 7: delete "station"; p2679, line 11: "iin" should be "in"; p2680, line 8: "if" should be "of"

Interactive comment on Biogeosciences Discuss., 4, 2667, 2007.

BGD

4, S1354–S1356, 2007

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