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Biogeosciences Discussions

Interactive comment on "Effects of CO_2 on particle size distribution and phytoplankton abundance during a mesocosm bloom experiment (PeECE II)" *by* A. Engel et al.

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Knowing the composition of the phytoplanktonic population during these experiments; because determination and counts were made in my laboratory, using the classical methods of optical and electronic microscopy, I have some remarks which can help to improve the manuscript The phytoplanctonic composition described in the paper is based on counter coulter and flow cytometry measurements. You have to take care on the results and interpretations because these two methods do not allow to discriminate genus and species, and do not give separate signatures for most of the taxa. Only Ehux has a specific signature using flow cytometry. So, can you explain how you have

determined Micromonas and Nitzschia signatures? The only way is to collect the subsample assigned to the species during the flow cytometric analysis (using a sorter), and to verify them using microscopy (here electronic microscopy because the cells are small). Did you do such a control? If not, I suggest to suppress these details, which do not give essential information, so suppress the names will not be prejudicial to the paper. Additionally, Nitzschia is not the only genus found in the study. Giving only this name for the description of the diatoms can let the reader to think that it is the most important, which is not the case.

Concerning the other informations on the phytoplankton, one problem could be that the volume analyzed by coulter counter (2 ml) and flow cytometry (not given here, but normally less than 1 ml) are too small to represent the whole phytoplanktonic community. So part of the information is probably loss using these techniques. Another important point is that detritic material can interfere with the cells, either with the autotrophic cells for material containing chlorophyll, or with the heterotrophic cells. And during these experiments, there was numerous detritic particulate material staying in the mesocosms. How have you solved this problem? and how have you controlled the interpretations of the different signatures obtained by flow cytometry? I can also say that diatoms were much more abundant than the data shown here. Part of the cells determined here as small autotrophes are probably diatoms. Moreover, all the taxa, including diatoms and dinoflagellates have small cells in these experiments. So the methods of determination used here, only based on the size and chlorophyll content of the material are very limited in regard with the complexity of the population. I suggest to be very precise in the manuscript on the limits of the methods and be cautious in the interpretation of the phytoplanktonic composition and in the discussion.

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