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Discussions

Interactive comment on "Effect of ocean acidification on the fatty acid composition of a natural plankton community" *by* E. Leu et al.

Anonymous Referee #1

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General Comments: In this manuscript fatty acid composition of a natural plankton community was studied at different pCO2, ie pHs. I do not think there are enough scientific results in this paper to be published by themselves. The authors used a lot of data from the same experiment to make a story. Also, I think that thirty days experiment is too short to reflect possible influence of acidification on fatty acid composition. There are always cascade mechanisms of phytoplankton community on stress. The first step is accommodation of phytoplankton community composition (as found here) or size, whereupon other cellular changes might be expected. The result on no indications for an immediate negative effect of ocean acidification on essential fatty acids is worth publishing.

Specific comments:

ABSTRACT CBM is not common, I suggest writing m3

2 Materials and methods p 8178, line 12: It should be stated in which 2 mesocosms CO2 was not added 18 : 4n3 might be assigned to Cryptophites (Dalsgaard et al., 2003, Table 1) which may explain deviation of 18 : 4n3 vector in Fig. 4 from the 8 : 5n3+22 : 6n3 (dinofl. markers) Results 3.1 General development of autotroph biomass (in terms of Chla) p8180, lines 18-19: The sentence: "It was characterized by a nanoplankton community utilizing predominantly organic nutrients." is overstatement for the dataset. It should be supported by data on phytoplankton size distribution and on exoenzyme activities, or by citation. Citing ms in-preparation is not acceptable. p8180, line 19: It is not "decreased, inorganic nutrients..", rather it is "few inorganic nutrients. . ." if I understood properly. p8180, line 23: I find very strange that picoplankton developed after nutrient addition! Overall, in this section there is too much citations of others work which does not suits to Result section.

3.2 Planktonic fatty acid composition

p8181, line 22:" The C18 n3 PUFAs both declined during phase 3;" is wrong stated as you have measured three C18 n3. Probably you meant both DinoïňĆagellate C18 n3 PUFAs. p8181, line 25: This should be new paragraph starting with: The overall PUFA content . . .

4 Discussion The authors discuss PUFAs in POM, but POM is not mentioned either in the Experimental or in Result section. Again, the authors discuss on: "dominance of nanophytoplankton, utilizing predominantly recycled nutrients (ammonia, DON), made available via grazing and the microbial loop." but this is not supported by any result presented. Almost half of discussion (p8185, line 14-p8186, line 23) is not directly linked to the aim: "The aim of this study was to describe how the fatty acid composition of a natural plankton community is affected by decreasing pH values". It is rather discussion on the comparison of results between different techniques (FAs, traditional microscopic analysis, HPLC) and on FAs of not-phytoplankton cirripedia larvae. For

me it seems that the authors put that part in the lack of results on FAs.

5 Conclusions It should be pronounced in the first sentence: “for the investigated time period.” The last sentence “It is likely, however, that other factors, most of all a change in average size distribution among phytoplankton due to taxonomic changes, will have a greater impact of the food web structure than the mere fatty acid composition of the community.” cannot be concluded from the FA results and therefore cannot be part of Conclusions. The authors obviously had approach to the other result, not presented here, that served for this conclusion.

Tables Table 2: I suggest removing non-significant values. P should be lowercase. Figures Fig.1. Chl a data from the Fjord are presented but are not discussed in the text at all. Fig. 3. Thick on axes should be visible. Some colours would be nice, at least for the Asterix. Fig. 4. Low CO2 symbols are blue and medium are grey in Fig. 2 while in Fig. 4 is opposite. It is better to be unified.

Interactive comment on Biogeosciences Discuss., 9, 8173, 2012.