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Biogeosciences Discussions

Interactive comment on "Copepod feeding and reproduction in relation to phytoplankton developmentduring the PeECE III mesocosm experiment" *by* Y. Carotenuto et al.

Anonymous Referee #2

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Comments on "Copepod feeding and reproduction in relation to phytoplankton development during the PeECE III mesocosm experiment"; by Carotenuto et al.

General: This is could be an interesting paper on the influence of different CO2 levels through the phytoplankton on zooplankton, but it contains several major flaws that make interpretation of the data difficult. The statistical analysis of the data is shaky at best.

Specific: (page/line)

3915/11 I do not understand that a rate can be lower than a concentration. This sentence as it is, is incorrect.

3916/16 I see this as an essential flaw of the study, as there is no replication in the CO2 treatments. All of the water comes from one mesocosm. This means that any difference between the mesocosms will be interpreted as being caused by the different CO2 treatments. I know, this would have at least doubled the effort, but it would have been better to use less animals per treatment, and replication in the mesocosms (or at least use a mixture of the water from similarly treated mesocosms to account for individual differences).

3918/26 Why was reproduction monitored for such a long period? The phytoplankton community will hardly have been stable during this period, any comparison between young and old females will confound age with food effects. If the main aim was to investigate effects of the food on reproduction during different phases phytoplankton development, the authors should have collected new animals every few days.

3920/11 I would have thought that it was common knowledge that by taking the colour combination used in the figures a substantial part of the readership will not be able to differentiate between the lines.

3921/1 This is certainly of interest, but we have no idea based on the data presented in this paper whether these differences have any significance. Due to the fact that there is no replication, these differences could be purely coincidental.

3922/5 I have strong objections against using a paired t-test for the statistical analysis in this experiment. First of all, I do not understand the numbers of degrees of freedom. Where all values on one day averaged before they were contrasted with the other treatment? More importantly, however, is that the values over the different days are not independent. The same animals were measured the whole time, and the 21 days of measurement in the experiment are not independent.

3923/14 Again the statistical analysis of the data is incorrect. First of all there is no value for n in tables 1 and 2, but I assume that all of the measurements through the time course have entered the analysis. There are several flaws in this analysis. Time

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course data are obviously not independent, algal densities on day 1 and those on day 2 will be fairly strongly correlated, because the algae cannot simply disappear or emerge. This means that by using all of the data in this analysis n gets artificially inflated, and correlations artificially increased as essentially the same comparison is made for a number of days. Moreover, both tables show 110 correlation coefficients based on more or less the same data. There is a strong need for a correction for multiple testing in this case, which in the case of a Bonferoni correction would set the experimental alpha to 0.05/110 = 0.00045. I doubt that many correlations would be significant then. This makes the correlation analysis invalid, and should be removed.

3924/8 It is unclear, whether the data presented here are different from the ones presented in the Schulz et al paper. I would certainly hope that the data are in accordance with the ones in the Schulz paper, they are the same mesocosms.

3926/13 I am not sure why this was not done, a direct C:N measurement would have helped, the drawdown is only indirect.

3928/24 The conclusion is rather shaky, I am not sure which differences between treatments will remain when the data are analysed properly. Furthermore, I am not sure what the sentence However...;. Means. In the worst case it means that the authors selected the two mesocosms with the largest difference in dynamics, with others showing much less consistent patterns.

Interactive comment on Biogeosciences Discuss., 4, 3913, 2007.