Biogeosciences Discussions

Biogeosciences Discuss., referee comment RC3
https://doi.org/10.5194/bg-2021-226-RC3, 2021

Comment on bg-2021-226

Anonymous Referee #3

Referee comment on "Biophysical controls on seasonal changes in the structure, growth, and grazing of the size-fractionated phytoplankton community in the northern South China Sea" by Yuan Dong et al., Biogeosciences Discuss., https://doi.org/10.5194/bg-2021-226-RC3, 2021

General commentsï¼□

The authors showed the size-fractioned phytoplankton community growth and grazing based on the result from dilution experiments. The authors also explained the biophysical factors which controlled the growth and grazing rates of micro-, nano- and pico-phytopalnkton. In general, this manuscript is novelty and a board international interest. The experiment was well designed and conducted, the data interpretation was sufficient and accurate. However, the statistical analysis and some data interpretation should be revised and improved.

Specific comments

Introduction:

1) Please add information about phytoplankton community in the study area.

Materials and Methods:

1) in the estuary system, the ammonium is important nutrient for phytoplankton. So please explain why not analyses ammonium as the control factor?

2) line128-130,'' Ten incubation bottles were enriched with dissolved inorganic nutrients of 5 μmol l^{-1}, $NaNO_3$, 0.5 μmol l^{-1} KH_2PO_4, and 5 μmol l^{-1}, Na_2SiO_3 to ensure the constant growth of phytoplankton (particularly to avoid nutrient limitation during winter).'' As we know, the N/P Redfield ratio is 16, Could you explain why you determine this N:P ratio (10) in your manuscript?

Results:

1) Line 238-239, "Generally, the annual average of the nutrient-enriched growth rate (1.68 d^{-1}) was higher than that of the natural growth rate (1.22 d^{-1}), indicating a nutrient limitation of phytoplankton even in this highly eutrophic system", i think the conclusion needs to be taken with caution, especially in the estuary system.

Discussion:

1) Line 261, "It is surprising to find negative intrinsic growth rates of nanophytoplankton during April and May 2019". The authors explained that "nanophytoplankton by itself tends to be limited by phosphorus". However, there were some similar situations in the Dec. and Feb., and the intrinsic rates of nanophytoplankton was higher. Could you give more information to explain the different results?

2) Line 283-284, "Interestingly, we found nanophytoplankton was more controlled by light than the other factors.", this experiment was conducted in the surface (2m), light should not limit phytoplankton growth. So please explain the reasons why nanophytoplankton was more controlled by light than the other factors.

3) in the 4.1, there was a strong negative correlation between salinity and phytoplankton growth, but the authors did not discuss the salinity how to influence the phytoplankton. A reasonable explanation may be obtained in terms of salinity.

Technical corrections

1) in the Fig.2, the legend of NO3 and PO4 is not the standard format, please revise it.