

Biogeosciences Discuss., referee comment RC1
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Comment on bg-2022-151

Anonymous Referee #1

Referee comment on "Diel variations in planktonic ciliate community structure in the northern South China Sea and tropical Western Pacific" by Chaofeng Wang et al., Biogeosciences Discuss., <https://doi.org/10.5194/bg-2022-151-RC1>, 2022

Wang et al. investigated the diel variations in the abundance, biomass, and community structure of planktonic ciliates in the northern South China Sea and tropical Western Pacific. They found that the abundance and biomass of ciliates at night were slightly higher than in the daytime, and ciliates perform diel vertical migrations. Overall, this study is interesting, and the data is valuable as few studies probed into the diel variations of planktonic ciliates based on time-series data. However, I have several concerns with the results and conclusions. I am afraid that the results presented in this manuscript cannot support their conclusions. Thus, I do not recommend the publication of this manuscript unless they address the following issues.

General comments:

- My main criticism is that there is no serious statistical testing throughout the manuscript. This is a fatal flaw which undermined the quality of this MS. All results are descriptive and hard to be trusted. The results and conclusion could be different, even opposite, if they conduct statistical testing.
- Many descriptions of results are not accurate. The authors seem to describe the results in a general way but ignore some different patterns between day and night and nSCS and tWP. For instance, the authors stated that the abundance and biomass of ciliate were higher at night than in the daytime without any support from statistical testing. In fact, the biomass of ciliates showed no difference between day and night in the upper 200 layers of the tWP based on Fig. 2.
- One of the main conclusions in this manuscript was that ciliates perform diel vertical migrations. However, the evidence for this conclusion is too weak to support it. The author calculated the weighted mean depth (WMD) of day and night and stated a difference between them. In fact, the difference may not be significant if they conduct statistical testing. According to Fig. 3, we can observe that the average WMD of day and night was similar for aloricate ciliates and total ciliates in the tWP. Based on these results, how can the authors conclude diel vertical migrations for all ciliates? It is interesting to observe the diel vertical migration for ciliates, but more rigorous and

robust evidence is highly necessary.

- The manuscript needs to be edited by a native writer. In many places, the text is confusing, and occasionally grammar mistakes are found. One issue is the phrase "in night" should be a grammar mistake. Instead, "in the night" and "at night" are more commonly used. Please check and revise it throughout the manuscript.

Specific comments:

Line 26 what do you mean by "preformed"? is it "performed"?

Line 147 change to "The average abundance and biomass of the water column were calculated following....."

Lines 150-154 change to "the tintinnid genera are classified into two groups based on Pierce and Turner (1993) and Dolan and Pierce (2013): Cosmopolitan, species; Warm Water, species....."

Lines 158-159 I don't understand "the midpoint of each sampling layer" is the sampling depth such as 200m? It seems that WMD is an important index for assessing diel vertical migration. It is better to describe it in more detail.

Lines 192-193 change to ".....mainly observed in the upper 100m of nSCS and 150m of tWP, and the values decreased down to 500m depth..."

Lines 194-196 This description seems not accurate. Based on Fig. 2, the highest abundance and biomass occurred in the DCM layers of the tWP. I cannot see a 'peak' for both abundance and biomass in the surface layer of tWP.

Lines 197-198 The average biomass in the upper 200m layer of tWP showed no difference between day and night. I don't think you can draw the conclusion that the average abundance and biomass were higher in the day than at night.

Lines 207-209 Were the difference in WMD between day and night significant in both nSCS and tWP? According to Fig. 3, the average WMD of aloricate ciliates and total ciliates in the day and night seems not different in the tWP.

Lines 216-217 how to calculate the integrated abundance and biomass? Is it the depth-integrated value? This should be explained clearly in the Method. If the difference is significant, the statistical test result should be presented after this statement.

Lines 220-223 change this sentence to "the average water-column biomass of tintinnids was lower at night ($0.017 \pm 0.003 \mu\text{g C L}^{-1}$) than in day ($0.020 \pm 0.004 \mu\text{g C L}^{-1}$)."

Line 224 "the water-column average abundances and biomasses" is a bit strange. I think it is the average value of water-column abundance and biomass, as you may first calculate the water-column integrated abundance and biomass and then calculate their mean. Please modify these phrases accordingly.

Line 224 This sentence described the difference between tWP and nSCS but started with "As to night and day variations"? Please rephrase it.

Lines 258-260 It is better to state that (1) the species prefer 50m and DCM; (2) the high abundance occurred at night more frequently. Please rephrase this sentence to make it clear.

Lines 274-276 This sentence contradicts what you just said. What do the numbers in brackets mean?

Line 278 What do you mean by "Between day and night"? for both day and night?

Line 280 add "in the nSCS and tWP," before respectively.

Line 281 Again, it contradicts the first sentence.

Lines 283-291 What is the size of the dominant species such as *S. faurei* and *D. ganymedes*? Why go back to species? Is there species information in Fig. 7?

Line 297 what do "temperature and salinity range" mean? Is it quantitative? Please specify how to get the conclusion about the broader range.

Lines 300-302 do you mean the range in the nSCS is smaller than that in the tWP? The temperature variation in the tWP is larger than nSCS. It is not surprising that you observed this result.

Line 324 change "phototrophic" to "mixotrophic".

Line 330-331 How do previous studies assess ciliate diel vertical migration?

Line 369 what does "biomass decreased" mean? Please state it more clearly.

Line 378-379 Tintinnids only feed on picoplankton and bacteria? I think they also feed on nanoplankton. Also, in the oligotrophic ocean, ciliates mainly feed on phytoplankton rather than bacteria, while ciliates in freshwater largely feed on bacterial (Weisse and Montagnes 2021; DOI: 10.1111/jeu.12879).

Line 388 "bimodal type" is not accurate.

Line 391 change "who" to "which".

Line 413-414 change to "the ciliate abundance and biomass at night were higher than that in the day".

Line 415 what does "preform" mean? A typo?

Line 419 In fact, depth and temperature are strongly correlated. The prey availability (Chla) may also affect the distribution of aloricate ciliates.

Fig. 3 Do the diamonds indicate the average values of WMD? Figure legend is needed for illustrating the symbols in detail