Comment on bg-2021-329

Anonymous Referee #2

Referee comment on "Contrasting vertical distributions of recent planktic foraminifera off Indonesia during the southeast monsoon: implications for paleoceanographic reconstructions" by Raúl Tapia et al., Biogeosciences Discuss., https://doi.org/10.5194/bg-2021-329-RC2, 2022

General comments
The manuscript by Tapia et al. presented valuable planktic foraminifera dataset off Indonesia where the available data are currently limited. Their plankton net study along with published sediment trap and surface sediment records will form the basis for understanding planktic foraminifera ecology, seasonality, and foram-based paleoceanography in this important region. The manuscript deals well with the contrasting foraminifera distribution in upwelling sector and non-upwelling sector, and also includes implications for paleoceanography, which thus falls within the scope of BG.
However, the authors concentrates on six of 29 species, and do not show all of the species list. My concern is whether the taxonomic concept is consistent between plankton net, sediment trap, and surface sediments. The current form of the manuscript lacks the discussion of rare species. Another concern is the consideration of anthropogenic climate change. Plankton net and sediment trap are susceptible to recent climate change, though surface sediments likely hold pre-industrial state. I also felt that figures can be improved to better convey the results and discussion of the paper. I recommend major revisions of the manuscript.

Specific comments
1. A total of 29 species were identified, but all the species never appeared in the manuscript. The authors tend to discuss the major 6 species, but rare species also hold important information of water column structure and thus implication for paleoceanographic reconstruction. Although the manuscript compared the number of species between plankton net, sediment trap, and surface sediments (Discussion 4.1), is the taxonomic concept the same? If any difference exist, the authors should care the consistency to discuss the diversity of foraminifera assemblage. Also, taxonomic identification rely on the works before 1989. But the genus Trilobatus should follow the paper by Spezzaferri et al. (2015 PLOS ONE). I would like to see all the species of plankton net, sediment trap, and surface sediments to infer seasonality and possible dissolution effect on both major and minor species.

2. Jonkers et al. (2019 Nature) paper presented modern plankton community driven by

anthropogenic climate change. I'm wondering whether recent climate change affects plankton net and sediment trap data, which potentially alters the relationship of foraminifera assemblages between plankton net, sediment trap, and surface sediments. Coincidentally, Jonkers et al. paper includes one sediment trap data off Indonesia (Mohtadi et al., 2009) and categorizes apparent warming for this region (historical change is cooling but the species composition shows warming). What is the relationship between this study and Jonkers et al. paper?

3. The authors stated that Ujiié (1968) paper is the only study using plankton net off Indonesia (L58). Then the author's study is consistent well with the Ujiié paper? Currently, there is only a general description (L252-254), and no comparison of species found and its standing stocks. Even though the Ujiié paper did not investigate the vertical distribution, at least surface distribution of foraminifera should be discussed.

4. Based on Figure 9, thermal gradient of plankton net in non-upwelling sector is 2 degrees C. However, the thermal gradient (delta T) seems much larger in the same sector in Figure 10. I couldn't follow the apparent difference in delta T between Figures 9 and 10. Please show absolute values of water depth and temperature in Figure 10, rather than relative values.

5. There are two discrepancies between plankton net data and surface sediment records. One is average living depths in Java-LSI (Figure 8). The other is thermal gradient in Sumatra and Java-LSI (Figures 9 and 10). What is the exact relationship between two discrepancies? If the discrepancy of the average living depths in Java-LSI is resolved, then the other discrepancy is also resolved? Although the authors already pointed out the different temporal coverage of sample types, as the Referee (and as a reader), I expect the authors to discuss possible solution for the discrepancy. Please consider the above comments (specific comments 1 to 5) to utilize valuable dataset to tackle the discrepancies between plankton net and surface sediments (and sediment trap).

Technical corrections
The manuscript uses the Ocean Data View and R software to plot and analyze the data. But no references and acknowledgements is presented. Please appropriately refer the ODV and R software.

L21 In addition to Katz et al., 2010, add seminal paper.
L28 Abbreviation of SST should be in L27.
L29 For transfer function, add seminal paper (e.g., Imbrie and Kipp, 1971).
L34 Add oxygen isotope before "d18O", and add ratio after "Mg/Ca".
L35 Rephase "popular".
L63 Add period after the end of sentence.
L104 Both sensu stricto (s.s.) and sensu lato (s.l.) are not italic. See Wang (2000) paper.
L111 What is the approach of Mohtadi et al. (2009) to differentiate N. dutertrei from N. incompta? Please explain briefly.
L140 Delete "psu". No unit for salinity.
L173 Delete "sea".

L184-L185 It is not clear that off Sumatra means transect 1-3, and Southern Sumatra and Java-LSI mean transect 4-7. Please clearly state which transect you mention, instead of area's name.

L196-L197 I'm not sure these references for what reasons. Six species have been often used in paleoceanographic studies? Then describe so.

L205 Typo, lysocline.

L208 Not Fig. 5g, but Fig. 5f.

L211 Not Fig. 5f, but Fig. 5g.

L217 Delete ")" after G. menardii.

L228 Any reference for the lysocline depth?

L260 and L381 Change from planktonic to planktic.

L263 Add "(white)" after G. ruber.

L296 How to calculate habitat depth from surface sediments? Please explain.

L303 Delete "inclusion of".

L308 Sort species name as in L286. Be consistent with the species order.

L332 Geochemical data of planktic foraminifera? It is not clear. Also, what is c of d18Oc? Calcite? State clearly.

L346 Rephrase "greater" to deeper.

L380 Delete "Possible". Implication itself includes possibility.

L403 It is not clear the meaning of thermal gradient "of" mixed-layer and deep-dwelling species. Perhaps thermal gradient "between" mixed-layer and deep-dwelling species?

L427 Does parentheses need for delta T?

L466 Typo, LSI.

Figure 1. Add the island names (Sumatra, Java, and the LSI) to Fig. 1a. Some readers are not familiar with this region.

Figure 2. I suggest to add horizontal lines (like error bars) on top of Fig. 2a showing each transect (1 to 7) corresponds what longitudes. In other words, 7 horizontal lines show longitudinal extent of each transect, which helps readers to understand regional contrast of temperature, salinity and so on. This is also true for Figure 5.

Figure 4. Add explanation for box plot. What is the meaning of box and bars? For stacked graph, legend is ascending order but the actual data is presented as descending order. I prefer ascending order also for the data.

Figure 5. The figure is currently shown up to 600 m. But the maximum water depth should be 500 m. Please limit the water depth.

Figure 6. Similar to Figure 4, add explanation for box plot. Are the axis logarithmic? It is not clear, since no axis is shown between 100 and 200 m depth. Also, significant digits should be the same (1 or 2?) for the median of ALD. Add space between "species" and "T. trilobus" in the figure caption.

Figure 8. Increase the font size of the species name. Remove italic from (white) for G. ruber.

Figure 9. Add legend for red and blue colors, instead of stating in the figure caption.

Figure10. In the figure caption, there are a and b. But a and b are not present in the figure. Be consistent with the caption. I prefer absolute values of water depth and temperature, rather than relative values.

Table 1. Put space after period for P. obliquiloqulata.

Table A1. Add "dd.mm.yy" for Date.