

Earth Syst. Sci. Data Discuss., referee comment RC2
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Comment on **essd-2022-107**

Alberto Sanchez (Referee)

Referee comment on "Large freshwater-influx-induced salinity gradient and diagenetic changes in the northern Indian Ocean dominate the stable oxygen isotopic variation in *Globigerinoides ruber*" by Rajeev Saraswat et al., Earth Syst. Sci. Data Discuss., <https://doi.org/10.5194/essd-2022-107-RC2>, 2022

Title. Salinity influences d18Osw and indirectly d18Oruber. The title should be more specific.

Introduction.

- The distinguishment of s.s. and s.l. morphotypes in *G. ruber* is crucial for the subject of the paper dealing with. which one(s) was (were) used? or was it a mixture.
- Include other factors that impact in the d18Oruber, for example, photosynthesis, symbionts, pH, alkalinity, among others.
- Similar studies have been conducted in the Pacific and Atlantic oceans and require citation, for example:

Farmer, E. C., A. Kaplan, P. B. de Menocal, and J. Lynch-Stieglitz (2007), Corroborating ecological depth preferences of planktonic foraminifera in the tropical Atlantic with the stable oxygen isotope ratios of core top specimens, *Paleoceanography*, 22, PA3205, doi:10.1029/2006PA001361.

Steph, S., Regenberg, M., Tiedemann, R., Mulitza, S., & Nürnberg, D. (2009). Stable isotopes of planktonic foraminifera from tropical Atlantic/Caribbean core-tops: Implications for reconstructing upper ocean stratification. *rine Micropaleontology*, 71(1-2), 1-19.

Thirumalai, K., Richey, J.N., Quinn, T.M. & Poore, R.Z. *Globigerinoides ruber* morphotypes in the Gulf of Mexico: A test of null hypothesis. *Sci. Rep.* 4, 6018; DOI:10.1038/srep06018 (2014).

Sánchez, A., Sánchez-Vargas, L., Balart, E., & Domínguez-Samalea, Y. (2022). Stable oxygen isotopes in planktonic foraminifera from surface sediments in the California Current system. *Marine Micropaleontology*, 173, 102127.

Materials and Methodology

- what certified or secondary reference standards were used?.
- In which laboratories each group of samples were measured.
- Provides a table specifying the date, number of samples, type of instrument used for collection and other relevant information for each cruise, including literature data.
- Include the distribution of salinity and temperature under contrasting conditions with and without freshwater input.

Results

- Include the P value in the correlation analysis.
- Fig. 4: The coefficient of determination (R^2) is very small, what other parameters are involved in this relationship?. Note that the isotopic change is larger over the same depth interval with respect to the 0.18 change. Why do you avoid describing this change in the d18Oruber?
- Fig. 5B: Describe in results and explain in discussion, the large variability in d18Oruber values with respect to the temperature range of 28 to 29°C.
- Include a Fig. of the spatial distribution of d18O of calcite in isotopic equilibrium.

Discussion

The discussion is very descriptive. The discussion needs improvement. So I recommend the authors to review the recent literature. Some aspects of interest are distinguishing between s.s. and s.l. morphotypes and how it affects oxygen isotopic composition, depth of calcification of *G. ruber* in the Indian Ocean and other oceans, symbionts and chlorophyll, carbonate ion, depth of lysocline i.e. dissolution, shell size. All these aspects will enhance the discussion. Include other regressions of d18Oruber-d18Ows vs temperature and the 1:1 ratio and their implications.

Please also note the supplement to this comment:

<https://essd.copernicus.org/preprints/essd-2022-107/essd-2022-107-RC2-supplement.pdf>