

Interactive comment on “Calibration of Mg / Ca and Sr / Ca in coastal marine ostracods as proxy of temperature” by Maximiliano Rodríguez and Christelle Not

Anonymous Referee #2

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This paper contains significant results relating to geosciences by using biotic carbonate. Original point of this paper is that Mg/Ca paleotemperature reconstruction was done by using brackish and very shallow marine species. This is a new approach and important for not only ostracod researchers but all paleoceanographers. However, some revisions are required. I showed my comments as below.

1) Water temperature ranges for Mg/Ca-temperature correlation in this MS was 2°C that is too small to establish the correlations between Mg/Ca and temperature. It is doubtful that the new regression lines for two species could really calculate 1°C (or less than 1°C) difference in the past water temperature. For instance, 1°C eas-

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ily differs depending on measurement methods and technical errors for bottom water temperature. The best way for revision is that additional ostracod shells from samples in lower or higher water temperatures will be measured. Both species inhabit in the modern seas within wider temperature ranges in the East Asia. If this is impossible, I suggest that the authors will show the basis that the new regression lines could calculate the 1°C differences of the past water temperature exactly.

2) Line 78: Authors used mean values for the last 20 years from the collection time of the samples. Please describe the reason that the last 20 years are the best for this research.

3) Water conditions including temperature, salinity and pH vary in a wide ranges within a few days in very shallow marine and brackish lakes as authors described in the MS. This is a large problem for temperature calibration because ostracod shells are calcified within a few days. I think comparisons between Mg/Ca in ostracod shells and annual mean values are reasonable methods. However, authors should show the variations in water condition for shorter time scales such as daily mean.

4) Figures 2 to 6 are low quality. Please make circles and lines clear to see. Particularly, circles for individual sample in fig. 2 are blurred. This problem might be due to the resolution in web systems. Please check them.

5) Line 203: It is better that all data of the correlation between the 24 parameters and Mg/Ca will be opened in the supplementary files or the appropriate web sites. Furthermore, data that authors used in the figures of the MS containing Mg/Ca, Sr/Ca values of ostracod shells, temperature and salinity. . .etc are as well.

6) Line 217: Authors noted that “the elemental composition of marine waters of HK do not seem to control the ostracod Mg/Ca and Sr/Ca ratios according to our data.”. Mg/Ca values in water are not enough to identify relationships between Mg/Ca in water and that in ostracod shell in this MS. Further, ecological records of the two species are lack in the present. Usually, periods that the ostracod specimen calcified its shell are

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unknown in the field study due to duration of life of ostracods as at least a few months. This means that we cannot compare Mg/Ca of individual ostracod shell to Mg/Ca in water when the specimen calcified its shell exactly excepting for cultural experiments. Particularly, water temperature and Mg/Ca of water shifted frequently in brackish and very shallow marines. Hence, I think the sentence shown above says too much.

In addition to the comments above, several mistakes are indicated directly in the pdf file. Please check them. This MS is good quality and contains useful records. I hope it will be published in the journal soon.

Sincerely yours,

Please also note the supplement to this comment:

<https://bg.copernicus.org/preprints/bg-2020-343/bg-2020-343-RC1-supplement.pdf>

Interactive comment on Biogeosciences Discuss., <https://doi.org/10.5194/bg-2020-343>, 2020.