

Ocean Sci. Discuss., author comment AC1
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Reply on RC1

Qian Tian et al.

Author comment on "Occurrence of structural aluminium (Al) in marine diatom biological silica: visible evidence from microscopic analysis" by Qian Tian et al., Ocean Sci. Discuss., <https://doi.org/10.5194/os-2021-78-AC1>, 2021

Authors' general reply:

We are very grateful for your comments and suggestions, which have been quite helpful in the improvement of our manuscript (Ms). In particular, inspired by some of the comments, we carefully considered the issues mentioned in the comments and improved the Ms accordingly. Please let us know if any more issues need to be clarified or if more revisions need to be made.

In addition to our point-by-point replies (details in the following sections) addressing your concerns, the replies to the major issues and the corresponding revisions are briefly summarized and listed below.

(I) One major concern is that few information of analysis was provided. It is true that this point was not well addressed in the original Ms. In the Method section of the revised Ms, we have supplemented the details, specifically those of sample preparation and analytical processes, including information of diatom culture, composition of artificial sea water, FIB-EDS analysis processes, and EDS precision. We revised the Ms to clarify this issue. Please find details from the replies to Questions 1, 3, and 4 in the following.

(II) The second major concern is the Al concentration used in our Ms is high. Yes, we used a high concentration of the dissolved Al in our study. The main reason is due to (i) although the Al concentration in open ocean ranges from < 0.1 nM to dozens of nM, the value is up to sever μ M in the river mouth and in heavily industrialised harbours (*Moran and Moore, 1988; Gillmore et al., 2016*). Our field work also found such the high Al concentration in the marginal sea, such as in Pearl River mouth area where living *T. weissflogii* diatoms were collected. (ii) The *T. weissflogii* diatom has high Al tolerance, which can live in Al-contained diatom culture medium with Al concentration of dozens of μ M (*Xie et al., 2015; Vrieling et al., 1999*), and the high Al concentration can be used. (iii) The incorporated Al can be detected. Accuracy of quantification of EDS used in our study is ≥ 0.1 wt%, and therefore, to avoid that the content of incorporated Al in BSi is too low to detect, the high Al concentration in the diatom culture medium was selected.

The replies to the major issues and the corresponding revisions are briefly summarized and listed on Supplement. Please keep us informed if any more questions are raised or further discussion is requested. Thank you very much.

Please also note the supplement to this comment:

<https://os.copernicus.org/preprints/os-2021-78/os-2021-78-AC1-supplement.pdf>