

Review for "Technical Note: silica stable isotopes and silification in a carnivorous sponge *Asbestopluma* sp."

Authors: K. R. Hendry, G. E. A. Swann, M. J. Leng, H. J. Sloane, C. Goodwin, J. Berman, and M. Maldonado

The authors present stable silicon ($\delta^{30}\text{Si}$) and oxygen isotope ($\delta^{18}\text{O}$) data for a carnivorous sponge (*Asbestopluma* sp.) from the southern ocean.

The data show a large variation within the specimen. The authors speculate that the variations are most likely caused by different silification modi as well as the distribution of hypersilicified spicule types (desma).

As $\delta^{30}\text{Si}$ data from sponges is used for the reconstruction of $\text{Si}(\text{OH})_4$ concentrations in the past, it is essential to do more calibration work and understand the mechanisms that influence the $\delta^{30}\text{Si}$ signature in sponges. Therefore I really appreciate this study and I definitely recommend the manuscript for publication. However, I have some minor comments, which should be addressed, before publication.

Abstract:

16575, L. 7,8 biological or vital. I would not use both.

Methods:

16581, L12: I would prefer to use 2sd for both isotope systems. I know that traditionally the standard deviation for oxygen isotopes are given as 1sd, but if we are strict with the reproducibility for Si isotopes, why not also with oxygen isotopes.

Results and Discussion

16582, L. 18-26: I think it is better to separate the discussion about $\delta^{30}\text{Si}$ from $\delta^{18}\text{O}$ in this paragraph.

I agree with the authors that there is a significant variation in $\delta^{30}\text{Si}$ between the internal and the external samples, but not for $\delta^{30}\text{Si}$, if a 2sd of 0.6 would be considered. Also the authors could discuss the $\delta^{18}\text{O}$ signature more in detail, especially in comparison to existing data.

Interestingly there is a strong relation between $\delta^{30}\text{Si}$ and $\delta^{18}\text{O}$ ($r^2=0.9$), even though both isotope systems are not controlled by the same mechanism. Why?

I think a more distinct discussion of the two isotope systems would be helpful.

In terms of the variation in $\delta^{30}\text{Si}$ and $\delta^{18}\text{O}$ I defiantly agree with the authors that there is a clear variation between the Internal and the external samples, but there is no clear trend from the basal part of the sponge towards the periphery. Why is the difference between the external and the internal sample decreasing from the base of the sponge?

16582, L.12: I wouldn't use phrases like "appears to be related". Is there a significant relation or not? The term "appears" is rather vague.

16582, L24-26: For the lower part of figure 5 (better separate in a and b) the $\Delta\delta^{30}\text{Si}$ value is plotted against $\text{Si}(\text{OH})_4$. Which $\delta^{30}\text{Si}$ for seawater was assumed here for the calculation? In general the $\delta^{30}\text{Si}$ of ambient seawater is never mentioned in any part of the manuscript, even though it has an impact on the $\delta^{30}\text{Si}$ of sponges. The authors should also discuss other processes (precipitation/dissolution) that can have an influence on $\delta^{30}\text{Si}$ and $\delta^{18}\text{O}$.

16584, L. 11: I think in general an important factor is the age and growth rate of the sponge already mentioned by the authors. Would it be possible to obtain data that give information for the age of the different parts??

Figures:

Fig. 3: shows an empty square in the lower right part, which is not supposed to be there I guess.