

## Response to report 2 – Minor revisions

Each comment has been taken into consideration and has been corrected. Please find below the response to each comment with in blue and bold the reviewer comment and the response in black. We would like to thank again the reviewers for their time and constructive comments.

- (1) Reviewer1,-P7L4-7: This reviewer indicates that here is not a reference to where the data are compiled (presumably within the manuscript). The authors respond that the data are presented in published papers (which are included in the manuscript) and Figure 2 (not referenced here). I believe that the reviewer is simply requesting that the authors refer to Figure 2 on P7 L4-7.** Figure 2 is now referred. See P7 L 23-24 “The  $\delta^{30}\text{Si}$ Spicules average signature of the two siliceous sponge families from the compiled data presented in figure 2 (Hendry and Robinson (2012), Wille et al. (2010), Hendry et al. (2010) with the equatorial Atlantic data (JC094)) show that the Hexactinellida class is significantly lighter than the Demospongiae, with  $\delta^{30}\text{Si}$ Spicules =  $-2.66 \pm 0.21$  ‰ (C.I. of the mean) and  $-1.91 \pm 0.30$  ‰ (C.I. of mean) respectively.
- (2) Reviewer2,-P6L7: This reviewer does not see the relevance of presenting Rayleigh-type fractionation. The authors respond that this is to emphasize that sponge Si isotopic fractionation does not follow Raleigh (should be spelled Rayleigh) type fractionation observed in diatoms. Up until this point, the authors do present anything related to diatoms or Rayleigh-type fractionation, and thus the comment appears to be out of context. I recommend that the authors either remove this comment about Rayleigh-type fractionation or provide a better argument within the text as to why it has been presented (e.g. explain the Rayleigh distillation model and why it is important for diatoms and paleoceanography).** The comment has been kept into the text with further argument about the Rayleigh type fractionation in order to clarify the sentence. See P6 L 17-19 “Published data have shown  $\Delta^{30}\text{Si}$  varying from  $-0.77$  ‰ to  $-6.52$  ‰ (figure 2b), which follow a non-linear relationship and cannot be described by a diatom-like Rayleigh fractionation (characterised by a constant fractionation factor during DSi utilisation) because isotopic fractionation during the uptake of DSi by sponges is variable, increasing with DSi concentration.”
- (3) Reviewer3: This reviewer wrote “Some questions regarding the dissolved Si concentrations: why are the dissolved Si concentrations for e.g. samples of the GRM location always 15.96  $\mu\text{M}$  although they have a distance of more than 250 km and a depth difference of 400m?” The authors responded: “Unfortunately, it was not always possible to collect co-located sponge and water samples: the water sample closed to the sponge location was analysed.” I think it would be good to mention this in the text under section 2.1 – Sample collection.** This information has been added into the section 2.1, see P3 L 26 “Sponge samples were collected by remotely operated vehicle (ROV) at five stations, EBA, EBB, VEM, VAY and GRM between 298 m and 2985 m (figure 1) aboard the RRS James Cook on the TROPICS cruise (JC094), a West-East cross section in the equatorial Atlantic between  $\sim 5^\circ\text{N}$  and  $\sim 15^\circ\text{N}$ , from the 13<sup>th</sup> October to the 30<sup>th</sup>

November 2013. Seawater was sampled using Niskin bottles attached to CTD rosette system and occasionally by ROV at each station. Whilst best attempts were made to spatially match the sponge and water samples, it was not always possible to collect precisely co-located sponge and seawater samples. The  $\delta^{30}\text{Si}_{\text{DSi}}$  values are reported in table A1 (appendix) and, for each sponge specimen, the closest seawater sample is used to calculate  $\Delta^{30}\text{Si}$ .