Interactive comment on “Carbonate “clumped” isotope signatures in aragonitic scleractinian and calcitic gorgonian deep-sea corals” by J. Kimball et al.

Anonymous Referee #1

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This article presents clumped isotope measurements in scleractinian and gorgonian deep-sea corals. The data are very interesting, but I think that the discussion needs to be rewritten. As it is, the discussion gives the feeling that gorgonian and scleractinian share identical processes of biomineralisation, which absolutely not the case. The discussion should be clearly separated between the two types of deep-sea corals. For example, as far as I know, calicoblastic cells were not detected in gorgonian corals, as well as ECF (see Noé and Dullo, 206). There are also a lot of imprecisions in the text.


In this section, I found it very unclear what is attributed to gorgonian or scleractinian.

19122-l6: Replace 'was' by 'were' 19122-l27: What do you mean by 'sufficient'? 19123-l25: It is Henkes et al (2014) in the ref 19125-l8-9: Is it in PDB? 19126-l6: 'Tables' instead of 'Table'. I am not sure that you have to refer to Table 3 here. 19126-l12-13: R2 instead of R. It is not consistent with the rest of the paragraph. 19126-l25: 'Noé' instead of 'Noe' 19130-l4: AFF is not defined. 19132-l3: Please add references. 19132-l10: It is Roark et al (2005) in the ref. In this article, I did not see any d13C and/or d18O data. Please verify. Please add references to Lutringer et al (2005), Rollion-Bard et al (2003, 2010). Between the centres of calcification and fibres, in scleractinian corals, you can have these two end-members. So why do you write that the mixing would be between
less extreme differences? Also, note that there are no COC in gorgonian corals.

Again, for this section, it would be clearer to separate the discussion between gorgonian and scleractinian corals.

19133-l18: Is there any reference for the observation of calicoblastic cells in gorgonian corals? Same remark concerning the scheme for the calcifying region. This model was developed for scleractinian corals, not for gorgonian.

19134-l19: It is 'Mavromatis et al'. This article is only about fractionation factor for Mg-calcite. I do not see why it is cited here. 19135-l4: Are you sure that brachiopod shells are aragonitic? 19135-l24: Please add 'e.g.' before the list of references as a lot of studies deal with this aspect. Here McConnaughey is misspelled. Is it 1989a or b? Watson (2004), DePaolo (2011), Gabitov et al (2012) and Watkins et al (2013) study inorganic precipitations. Why are they cited here concerning the calcification processes in calcifying organisms?


Please note that the model of Adkins et al (2003) is not compatible with boron isotope data (see Blamart et al, 2007; Rollion-Bard et al, 2010).


Between Figures 4 and 5, please use the same colors for the symbols. Figure 6: Precise if it is Defliese et al 2015a or b. Please add error bars. Figures 7, 8, 9: Please add error bars. Figure 9: Please enlarge the symbols. Figure 11: Please specify that this model is for scleractinian corals. For example, the data of Farmer et al (2015) are not in favor of an elevation of pH.

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