

Review for Bertlich et al. „Salinity control on Na incorporation into calcite tests of the planktonic foraminifera *Trilobatus sacculifer* – Evidence from culture experiments and surface sediments“

Bertlich and co-authors present an interesting and important study for proxy development by using Na/Ca ratios of the planktonic foraminifera *Trilobatus sacculifer* to reconstruct salinity using electron microprobe analyses. This study is well designed as the authors present a foraminiferal Na/Ca-salinity calibration curve which is based on culture experiments and compare this curve with actual surface sediment samples from two different tropical Atlantic regions. The culture experiments comprise a wide range of salinity and also test the influence of temperature on Na incorporation into foraminiferal tests. Further controlling factors of Na incorporation are also explored briefly. The results of the surface sediments agree well with the culture experiments which validate the calibration curve presented in this study.

The manuscript is mostly well written, logically organised and clear. The figures are overall nice and clear. I think that this work is an interesting and important contribution and therefore suitable to be published in Biogeosciences. Nevertheless, I would like to see the points below addressed by the authors.

Main points

1) You mention in the manuscript that your intra-test variability of the temperature experiments is less than half than that of the salinity experiments. I am extremely sorry, but I strongly disagree. According to Table B1, the variability between both experiments is similar. The average intra-test variability of the salinity experiments is 10.82% RSD, the half of this is 5.41% RSD, but only 9 out of 27 individual foraminifera results of the temperature experiments have actually lower RSDs than 5.41%. So please change those sentences (L260-262, L382-384) or make clear what you mean.

2) Although the data is good and relevant, the authors did not convince me of their results in the discussion, especially Sections 4.3 and 4.4. The authors introduce an interesting train of thought but then did not think it through, instead they start a new line of thought or connect one idea with another seemingly unrelated. I really like the first section of the discussion because the influence of biological processes/response is brought into focus which is important for this study, considering that Na⁺ ions are essential for ion channels/pumps and for the general functioning of cells and could therefore influence/bias the incorporation into calcite tests. However, Section 4.3 did not address these and other biological aspects further and the reader is left with a lot unanswered questions. Furthermore, the authors jump back and forth in this section which makes it hard to follow each line of thought. Your data is great! You just need to sell it better.

3) Your calibration indicates an increase in Na/Ca ratios by 2.25% per salinity unit. However, you intra- and inter-test variability is much higher than that ranging from 1.83-16.21% and 3.19-11.51% (according to Table B1) when using electron microprobe (or other micro-analytical techniques). Could you please give an estimate on how many individual measurements are needed to distinguish ± 0.5 -1 salinity units analytically and statistically?

4) You say that dissolution and early diagenetic processes do not influence the foraminiferal Na/Ca ratio of your surface sediments, however, you state in the Material and Method section that you only chose sites, where $\Delta[\text{CO}_3^{2-}]$ is $>30 \mu\text{mol/kg}$, which in turn is above the critical calcite saturation value given by Regenberget al. (2006, 2009). Therefore, please explain how you can address the effect of dissolution on Na/Ca ratios.

In this regard, it would be of benefit if you could insert the $\Delta[\text{CO}_3^{2-}]$ values for your stations in Table 1. Have you tried to plot your Na/Ca values from Table 1 against $\Delta[\text{CO}_3^{2-}]$ to see if there is a relationship?

Further, did you check (visually, by SEM) the tests of the surface sediments for any signs of dissolution/early diagenesis?

I guess, this is difficult to address with EMP, but do you see differences in test wall thickness, test size or thickness of primary calcite between specimens from shallower and deeper stations in the Caribbean Sea (similar to the results from Johnstone et al. 2011, Sadekov et al. 2010)? Assuming you did measure some tests by using EMP...

Minor points

L24-25 better to say "...indicating salinity to be/is one of the dominant factors..." as I think the biological component on Na incorporation into calcite is still unclear.

L26-27 Considering that the biological influence is still unclear, maybe replace "reliable proxy" with "potential proxy".

L74-76 It would be interesting to see if *T. sacculifer* and *T. triloba* actually have a similar geochemical signature. Did you test this? If so, could you please provide these data in the supplements? This would then be the first time such a comparison has been done.

L91-94 Were the (SCUBA dive-) collected specimens of *T. sacculifer* juveniles or young adults? Please indicate.

L104-105 Your "slight" increase in salinity of 0.5-0.8 units during the 29.5°C experiment is actually the salinity range you say you can resolve with your calibration! Please delete "slight". What does this mean for your error bars in Figure 5 if you include the related uncertainty?

L113 Please insert that the water depth is also given in Figure 1 and Table 1 as this is important concerning the preservation state of the tests. As mentioned in the main points, could you please include the $\Delta[\text{CO}_3^{2-}]$ values for your stations in Table 1?

L196-198 Can you please give the concentration of your hydrazine solution?

L211-212 This sentence reads odd. Do you mean your measured value is $19.79 \pm 0.51 \text{ mmol/mol}$? If not, which reference did you use and what is your analysed value for Na of the JCp-1?

L213-214 When you say "every sample solution was measured 5 times", do mean your foraminifera samples only or also the JCp-1? Please be more precise.

L233-234 Reference Figure 3a to be precise. You also have a comparably large range in your temperature experiments $19^\circ\text{C} < x < 24^\circ\text{C}$ for salinity 36 according to Figure 3b and Table B1. Please mention this here or in the section about the temperature experiments.

L260-262 As mentioned in the main points, please delete this sentence as this is not true according to Table B1: Only 9 experiments out of 27 have actually lower intra-test variability.

L269-270 The value of 4.71 ± 0.21 mmol/mol is not listed in Table 1, the lowest value in Table 1 is 4.64 ± 0.25 mmol/mol.

L281-283 Please explain briefly what the salinity uncertainty of the Gulf of Guinea surface sediments means, illustrated by horizontal error bars, as this is only mentioned in the caption of Figure 4. Why is there no such uncertainty for the sediment samples from the Caribbean Sea? Is the error bar as big as the symbol? If yes, please say so.

L285-287 Could you please give an explanation why the stations GIK 16860-1/16864-1 have higher Na/Ca values than station GIK 16865-1, although they are all close to the river mouths, similar to your explanation in L270-273?

L293-294 According to Table B1 your Na/Ca intra- and inter-test variability varies between about 2-16% (lowest value: 1.83%).

L300-303 You can also reference Hathorne et al. 2009 here.

L303-305 Please reference Spero et al. 2015 here.

L306-309 I do not think that Figure 4 shows that the lowest intra-test variation is obtained at conditions close to those at the natural habitat. Reference only Figure 3 here.

L306-314 I really like that you discuss here the possible biological response to increased stress levels. You say that increased stress levels could lead to higher intra-test variability. Could that have influenced your Na/Ca values at low and high salinities (like seen in Figure 3 – high variability at $T < 24^{\circ}\text{C}$ and at $S \geq 41$)? Could this, in turn, result in a lower or steeper slope of your calibration curve?

L328-330 Mention here, that you assume that the observation of Branson et al. (2016) could also be valid for *T. sacculifer* and other planktonic species.

L347-349 Please indicate here how many individual measurements are necessary to achieve resolving a salinity change of about 1 unit using EMPA, as addressed in main point 3).

L350-351 What do you exactly mean with “little small-scale variability”? The intra- or inter-test variation itself or compared to the higher variability of Mg/Ca?

L356-357 As said before and in main point 3): Please state the minimum number of individual analyses to actually resolve a salinity change of ± 0.5 -1 units?

L379-380 I would not be so hasty, the study of Mezger et al. was a field calibration which means there are most likely several factors that induce stress or otherwise influence the Na^+ incorporation compared to a culture study with rather stable conditions. The different results between the field and the culture studies implies to me that there are other controlling factors than salinity alone. The results from Mezger et al. could also be region-specific or relate to the variation in salinity within one transect as the authors mentioned. But this needs to be discussed in more detail as mentioned in main point 2).

L382-384 As said in main point 1), your intra-test variations are similar between the salinity and temperature experiments. Please delete this sentence.

L433-435 As mentioned in the main point 4), you state in L140-143 that you have only used sediments from sites with $\Delta[\text{CO}_3^{2-}] > 30 \mu\text{mol/kg}$, which is higher than the critical calcite saturation level. So, how do you know that dissolution did not affect your Na/Ca ratios? Did you check those samples for any signs of dissolution/diagenesis (visually or by SEM)?

L435-437 I think what you mean here, is that your surface sediment samples fit nicely to your calibration curve, but the sediment samples themselves form a cloud if you look at Figure 6. Therefore, these data do not show any trend or even a slope as you state here. Please rephrase this sentence. I also think that you should reference Figure 5 here as well, as this figure shows a good comparison of your culture data and the sediment samples including their similar variability.

L449-451 Can you please give examples of which kind of biogenic calcite is meant here? A specific species or a species group? And was this relationship found a specific (regional) setting?

L461-463 Can you please briefly explain what you mean by the biological control on Na incorporation is smaller than for Mg? Or delete the last part of this sentence as you compare and discuss D_{Na} and D_{Mg} in L468-473.

L464-465 Can you please explain this in more detail? Up to this point, you always said that the Na/Ca values at salinity 44 are low because of the precipitation of gametogenic calcite. So, what other biological aspects can influence the Na incorporation?

L464-467 You said that you only found gametogenic calcite at salinity 44 and that such high salinities could impact the growth of the test and therefore, the Na incorporation. So, what does that mean for your highest salinity experiment at $S = 45$? Do you see gametogenic calcite in those samples and if not, do you have an idea what makes $S = 44$ so special? Or why do the samples at $S = 45$ fit to your calibration and those at $S = 44$ not, if high salinity has an impact on Na/Ca?

L488-490 What about all the other possible controlling factors? In Section 4.3, you discuss that the cleaning procedure, the photosynthetic rate of symbionts, thermal stress and potentially dissolution can impact the Na/Ca values. Can you rule out some of the factors? If so, please mention this in Section 4.3.

L493-494 the same as in L433-435.

Table 1 Is the salinity and temperature record of the World Ocean Atlas (2013) that imprecise that your values have an error of $\pm 30 \text{ m}$? Please include the $\Delta[\text{CO}_3^{2-}]$ value for each station, as mentioned in main point 4).

Figure 7 You show 3 different regression lines for *T. sacculifer*, which suggests that there could be other influences on Na/Ca than only salinity, in my opinion. You give several potential explanations in Section 4.3, but could you please explore the potential (unknown) impact of biological processes on Na/Ca as mentioned in main point 2)? What makes your calibration the most reliable one? Consider your big advantage of culture and surface sediment samples.

Table B1 I am confused. Why does this table give different values and uncertainties for the individual measurements than Tables 4 and 5. Not all values are the same as listed in Tables 4 and 5. Does this result in slightly different intra- and inter-test variabilities?

Style and language:

1) Please check your grammar and word order in your sentences. It is sometimes hard to follow what you mean. And please try to avoid nested sentences, they are confusing, e.g. L64-67. It is better to split those sentences into two to be more clear. For more examples, see also minor points below.

2) The discussion, especially Sections 4.3 and 4.4, needs to be better structured. As mentioned before, the arguments should be linked better. Additionally, the authors jump back and forth in this section which makes it hard to follow each line of thought.

L40-41 In the entire manuscript, you cite the references in chronological order but here alphabetically. Please change this to be consistent.

L58-60 better to say "The high spatial resolution of the microprobe technique..."

L64-67 As mentioned above, please avoid such nested sentences and make 2 sentences here as this sentence is confusing and somehow reads more like a list.

L82-84 better: "Prior to gametogenesis at the end of its life cycle, a process related to reproduction, *T. sacculifer*..."

L118-120 I would delete the part of the sentence about the Subtropical Underwater mass as I do not think you need this information, since *T. sacculifer* lived in the Caribbean Surface Water mass.

L120-122 I think you mean: "...entering the NE Caribbean through the Lesser Antilles."

L130-131 If you reference more than one figure, please use plural, e.g. Figures 1b-d. This is valid for all your references to your figures (e.g., L231, L239, L253, L267, L269, L270, L275, L280, L287,...).

L138-139 Please reference Figures 1b and c here which show salinity at 30 m and with increasing depth as you say in this sentence.

L152-153 If I am not mistaken the abbreviation is "EMPA".

L154-155 "...were covered by a 20 nm carbon coating..." better to say "...were impregnated with carbon coating..."?

L161-162 Please use either "shell" or "test" to be consistent. You mostly use "test" in the manuscript.

L170-171 better to say "Absolute Na/Ca ratios were calculated using..." instead of "quantified"

L170-171 Please delete I_{back} and I_{total} as the abbreviations are not needed, you do not use them again in the entire manuscript.

L171-172 I know what you mean but it sounds wrong to compare intensities with concentrations. I think it is better to state: "The obtained net intensities were converted to concentrations and corrected to known concentrations (in wt %) of referenced materials."

L198-199 "The samples were thoroughly rinsed to remove the chemicals..."

L201-203 Delete "...and dissolved...", it does not really fit with the rest of the sentence.

L205-206 „The machine is..." device?

L206-208 "...these wavelengths were 70.60 nm for Ca, 279.55 nm for Mg, and 589.59 nm for Na."

L208-209 Delete one "with".

L209-210 Delete "Hence" at the beginning of sentence.

L211-212 You give only one values, so please use the singular. Also, provide the value together with its uncertainty using " \pm ". Please use the past tense in this sentence. Please be also consistent in how you report units. Here you use "mmol/mol" whereas you mainly use "mmol mol⁻¹" in the manuscript. This is also valid for the tables in which the units are reported in one or the other version. You always use "mmol/mol" for your plots, but could you also change the unit to "mmol mol⁻¹" to be consistent throughout the entire manuscript?

L227-228 Space between 13.2 and %. Please be consistent, whether you use a space between numbers and the % symbol or not.

L230-231 I do not think that Figure 4 represents the low variability of the experiment at 26.5°C and salinity 36. I guess, it would be better to cite Section 2.3 here where you describe the natural habitats.

L237-239 Reference Figures 3a and 4.

L251-252 Delete "...within the same temperature interval.". The interval mentioned in the sentence before is your entire range of T experiments, so this bit of text is not needed, on the contrary it is confusing.

L257-258 This information is already said in L228-230, however, fits better here in the T experiment section. Hence, delete sentence in L228-230.

L259-260 Reference Figure 3b here.

L272-273 You are always very precise with reporting differences between Na/Ca values, so please say here " \pm 0.16 mmol/mol" or say "about 0.2 mmol/mol". Further move "noticeable" to after "increase of about 0.2 mmol/mol".

L278-280 better to say "...as the inter-test variability indicates of specimens from..."

L290-291 Please decide whether you use "shell" or "test" in your manuscript. I think, it is better to stick to one expression to be consistent. You mainly use the term "test".

L306-308 I would rephrase this sentence a little bit: "Transferred to our study, higher Na/Ca intra-test variations may occur between maps within single wall cross sections of each salinity experiment compared to the temperature experiments (Table B1) due to higher stress levels of (individual) foraminifera in culture."

L315-316 Delete "more or less". I think it is not important here how much GAM calcite is produced, only that it is precipitated.

L318-320 Delete "probably" and say instead: "...their biomineralisation mechanisms could be fundamentally different."

L320-321 Insert "at salinity 44" at the end of the sentence to make it clear. Also "Figures 3, 4".

L327-328 Rephrase this nested, confusing sentence, e.g.: "...dark layers in benthic foraminiferal calcite, most likely comprising the primary organic sheet, which in turn is located between the primary and secondary calcite."

L339-341 In your plots and other parts of the manuscript, the word "versus" is spelled out and not written in italics. Please be consistent throughout the manuscript. Further, maybe insert "their" between "for" and "*T. sacculifer*" to make clear that only Allen et al.'s study is meant here.

L341-342 Reference Figure 7 at the end of the sentence.

L342-344 Also reference Figure 7, best right after "Allen et al. (2016)" and reference Section 4.3 at the end of the sentence as you discuss in detail the difference between those previous studies in that section.

L351-353 As mentioned before, please use either "test" or "shell" in the manuscript.

L360-362 Please spell "YD" out as it is only used this once in the entire manuscript.

L362-363 "...a salinity decrease of ~2-4 salinity units." I am not sure if you need the "salinity" in front of "units" as you already said it is about salinity.

L364-366 Please make 2 sentences out of this nested sentence as it is confusing. You also used " $\delta^{18}\text{O}_{\text{IVF-SW}}$ " before instead of " $\delta^{18}\text{O}_{\text{IVC-SW}}$ ". Please stick to one term.

L366-367 Desirable instead of "helpful"?

L367-369 "Instead, the addition of Na/Ca..."

L374-376 "In contrast, the Red Sea study..."

L377-379 As mentioned before, please use either "test" or "shell" in the manuscript.

L381-382 Reference Figure 3b here.

L387-438 As said in point 2) (Style and Language) please re-structure this section. I think it might be easier to list all potential factors first and then explain them in detail, as it is not clear until L392-393 what you mean with the first sentences. Please make separate paragraphs when you start discussing another potential controlling factor.

In L394-400 you discuss that several carbonate system parameter could influence the Na/Ca values and then in L406-409 you talk again about the influence of carbonate system parameters on Na/Ca ratios. Please combine these parts.

You also need to link your sentences better in this section, as sometimes (see listed below) it is not clear what you mean.

L390-392 Better to move "for the overlapping salinity intervals of 30 to 38" to the end of the sentence and insert the reference to Figure 7 right after "Allen et al. (2016)".

Start a new paragraph after "...further study." in L394 as you then start discussing the influence of the carbonate system parameter on Na/Ca ratios and not the impact of cleaning procedures.

L395-398 What are those "many co-varying factors"? Please give some example. Is it pH, DIC? Say this here and you have a nice link to your next sentence.

L398-400 Please insert "in the Red Sea" between "...foraminiferal Na/Ca ratios" and "(Mezger et al., 2016)" to make clear this still relates to the study in the Red Sea. Also start a new paragraph after this sentence as you go on about Na heterogeneity in tests.

L403-405 Please rephrase this sentence, it sounds odd. E.g., “Previous studies possibly provide a mixed Na/Ca signal because chamber wall calcite and spines were analysed together for elemental composition of foraminifera tests.”

L406-407 Delete “also” after “...confidence interval)”. Further, link this sentence better to the next as you jump from increasing $[\text{CO}_3^{2-}]$, DIC and pH to element partitioning and calcification rates. Hence, it is best to combine this paragraph (L406-409) with the paragraph in L394-400 where you actually say that an increase in DIC, pH, $[\text{CO}_3^{2-}]$ could cause higher precipitation rates.

L410-412 There is also the link between the 2 sentences missing. Here is a suggestion: “...micro-environment of foraminiferal tests, driven by photosynthetic activity of symbionts. This activity depends on nutrient concentration and light intensities and thus can actively change ...”

L412-414 This sentence reads also weird. Maybe: “Higher photosynthetic rates influence test geochemistry which has been demonstrated by(?) boron...species, such as *O. universa*...”

L414-417 This sentence needs to be restructured. The part “although within...error of the mean” should go to the end of the sentence (between “specimens” and “(this study,..)”). Also, put a comma after *T. sacculifer*. However, I do not really understand what you mean to say here. Do you suspect different photosynthetic rates to explain that offset between culture experiments and surface sediments/in situ grown chambers? Then start a new paragraph after this sentence, you then discuss the influence of light intensities. Or better link it to this paragraph (L410-417).

L420-421 If the discussion of the light intensities belongs to the part before, start now a new paragraph as you talk about thermal stress. If the part about the intensities is meant to go with the following paragraph (L420-425) you need to better link these ideas, as I do not see a connection between light intensities and thermal stress.

Also, insert this entire sentence “We speculate...culture experiments.” after the next sentence “Previous studies...(Edgar et al., 2013).” and maybe connect it with “Hence, we speculate...”. Then maybe start the next sentence “This warming/thermal stress impacts the...”.

L426-428 Delete “for example” and change “or” into “...Cd/Ca, and Ba/Ca...”.

L428-430 Use a comma instead of semicolon to cite more than 1 publication of the same author (here, Regenberg). I would change this sentence a little bit “...report a decline in planktonic foraminiferal Mg/Ca below ~2500-3000 m...”

L431-438 Here, you do not need a new paragraph as you continue to discuss the effect of calcite dissolution. Again, use comma for “Regenberg et al. 2009, 2014”.

L432-433 This is no full sentence, there is the main clause missing or do not start this sentence with “as”. Further, move “(± 0.25 mmol/mol)” to the end of sentence, just before the reference to your figure and table.

L433-435 better: “Although the calcite saturation state is quite different in bottom waters, we suspect...” Full stop is missing here.

L441-444 It is better to split this sentence into 2, using “alternatively” as the beginning of the second sentence. Better: “In this case, two...”, “...accompanied by anions, such as Cl...”

L444-447 Put “so far” after “...experiments of aragonite, so far, in which...”

L447-449 missing commas "...biogenic calcite, such as foraminifera...~5 mmol/mol), and aragonite, such as corals..." Further, link this sentence better to the next, there seems to be no connection between what you just said and the next sentence.

L451-453 "...with increasing(?) growth rates of inorganic calcite..." Do you mean it that way?

L454-456 It is better to give the D_{Na} value of foraminifera first before you compare it to the inorganic value. Or start your next sentence saying that the inorganic D_{Na} value is higher than your foraminifera equivalent and then give your calculated value.

L456-457 better: "..., using $Na/Ca_{seawater}$..."

L457-458 Who do you mean by "their"? Delaney et al. or Busenberg and Plummer? Please specify. Also: "...and of this study."

L458-460 Delete "listed in the following" and maybe put a colon after each D_{Na} value instead of a comma, like this: " $D_{Na} = 0.1 \times 10^{-3}$: *T. sacculifer*, *G. ruber*..."

L460-461 Rephrase this sentence to: "The highest D_{Na} of $0.18-0.25 \times 10^{-3}$ were found in the field calibration study..." or "Mezger et al. (2016) found the highest D_{Na} of $0.18-0.25 \times 10^{-3}$ in their field calibration study..."

L463-467 Can you please restructure these 3 sentences? I was confused about what you mean until you mention the influence of the gametogenic calcite in the last sentence (L466-467). Maybe start with this last sentence and then that you deduced from the presence of the gametogenic calcite that there has to be a biological control on the Na incorporation.

L468-469 "In comparison to foraminiferal D_{Na} , the partition ..." Please give a value or a range for the D_{Mg} .

L474 Maybe better to use "requires" instead of "affords".

L477-479 There is a verb missing in the last part of that sentence. Please rephrase, e.g., "...in seawater are only affected by temperature changes to a limited extent, and hence temperature has minimal influence(?) on Na incorporation..." if I understand your last part correctly.

L484-485 Delete opening parenthesis before 2016: "(Allen et al., 2016)".

L485-487 "In our experiments, we..." I also think your intra- and inter-test variability is ±16%.

L520-719 References: Maybe this is an issue of converting your file into pdf, but could you please use indentation to separate individual references? The way it is at the moment is hard to read.

Table 1 Can you please change mmol/mol into mmol mol^{-1} to be consistent?

Table 3 Please rephrase the sentence "Chambers grown in situ..." because it sounds like that the chambers that grew in situ are different to those which grew in the natural environment. But they are the same, that is at least what you say in the manuscript text.

Figure 1 Can you please insert a line at 30 m in your plots 1c, 1d to make a direct comparison easier between the hydrography plots and surface maps.

Figure 3 caption, better: "(19.5 – 29.5°C)" or "(19.5°C – 29.5°C)" Further, please mention here that the experiment at salinity 44 is excluded because of the precipitation of GAM calcite.

Figure 4 “Related raw data of salinity experiments...” better to say “Related data of individual measurements of the salinity experiments...” because the data presented in Table 3 are not raw data per se (Raw data would be the measured intensities for each element.) but your final, calculated data.

Please say: “Datasets for T = 26.5°C of both temperature experiments (S 33, S 36) were added (Tables 4, 5).”

Insert: “Horizontal error bars of samples from the Gulf of Guinea demonstrate...” But why only for those sediments? What about the surface sediment samples from the Caribbean Sea? Is the error as big as the symbol size? If yes, please say so.

Move your sentence “Data marked by yellow,...” to after you explained those symbols, that is “...Caribbean surface sediments (Table 1).” Those data is not listed in Table 2. Also reference Table 3 for the in situ chambers and Table 1 for the Gulf of Guinea samples.

Figure 5 Similar to Figure 4: better to say “Related data of individual measurements...” instead of “Related raw data...”. Also, “Tables 4 and 5”

The same as in Figure 4: “Horizontal error bars of samples from the Gulf of Guinea demonstrate...” Why only for those sediments?

Figure 6 Can you please label the dashed line in your plot with “95% confidence interval” to make it easier to read this plot?

Figures 4-6 This is a very personal thing, but maybe consider to present the numbers on your axes with the same decimal digits, e.g. 8.0; 7.5; 7.0;...

Figure 7 Please be consistent and use as font style regular instead of italics for “versus”, which you otherwise use in the entire manuscript. Further move “versus salinity” in the first sentence to the end of the sentence, as it is confusing, or incorporate “versus salinity” into a new sentence, e.g., delete from the first sentence and then say “Foraminiferal Na/Ca values are shown versus/against salinity.”

Better “Regression lines are based on the following equations; Wit et al.,...”

The equations are given in R and R². Is this correct?

Figure 8 Please give the salinity of the other studies (Allen et al., Mezger et al.) in the legend of this plot for a direct comparison.

Similar to Figure 7: Move “versus temperature” in the first sentence to the end of this sentence or make a new sentence, e.g., delete from the first sentence and then say “Foraminiferal Na/Ca values are plotted versus/against temperature.”

Table A1 caption “...listed in Tables 3, 4, and 5.”

Table B1 caption “...averaged maps (Tables 3, 4, 5)...” Further, please be consistent and use “Intra-test” and “Inter-test” in the header of your table, like you do in the text.

It would improve the readability of this table if you insert a header for the salinity and the temperature experiments like you do for the in situ grown chamber and maybe separate the different experiments/data by horizontal lines.