

Dear Niels and co-authors

First, apologies for the long time to reach a decision - I had hoped to secure a re-evaluation by one of the original reviewers yet this proved not to be possible.

You have transparently explained in excellent detail how both review reports were addressed, and I think the clarity of the manuscript has improved considerably, in particular regarding the reservations raised by Reviewer #2 regarding the resolution of your data (smoothing issues). This was the main concern and this is now well described in the revised version so that no ambiguity remains and readers can make their own correct assessment on how to interpret this.

I have listed a few minor changes below which I consider technical.

Line numbers refer to the revised (track changes) version

Dear Prof. Steven Bouillon,

Thank you for moderating the review process and for putting in the effort to try to get a second opinion from the reviewer. We highly appreciate you taking the time to go through our manuscript yourself to give us feedback and are glad to read that you consider our revisions acceptable. Below, we will briefly outline how we addressed your remaining points in a point-by-point fashion:

-throughout the text: use mmol mol<sup>-1</sup>, μmol mol<sup>-1</sup>, etc. rather than mmol/mol and μmol/mol, etc. This should be quick to replace.

This has been replaced throughout the text.

-L76-77: the oxygen isotope values --> the oxygen stable isotope composition

Rephrased

-L257 and L 266: remove '\*'

We removed the "\*"

-L473 (Table 1): please provide a more complete Table caption - should be clear without consulting the text. Unless I'm misinterpreting, the different values separated by comma's refer to counts by different people, and values in bold imply correspondence between increments counted on outer surface and in cross sections ?

Correct, these explanations have been added to the table caption.

-L653: (Lorrain et al., 2005) --> Lorrain et al. (2005)

The reference has been updated.

-L670: 'contradicts the assessment': would rephrase to indicate that the finding referred to would then not be generally valid.

Agreed, we rephrased to: "This suggests that the findings by Gillikin et al. (2005) that background Ba/Ca concentrations are a function of environmental conditions and can be consistently subtracted from Ba/Ca records to separate peak from background values may not be generally valid."

-L738:(Carré et al., 2006) --> Carré et al. (2006)

The reference has been updated, this consistent mistake has crept in due to the use of a reference editor and we have tried to amend it throughout the text.

-L745:(Gillikin et al., 2005) --> Gillikin et al. (2005)

The reference has been updated.

-L774: idem

The reference has been updated.

-L776: (Batenburg et al., 2011) --> Batenburg et al. (2011)

The reference has been updated.

-L1253-1254 (Madkour, 2005): reference contains Arabic; I doubt that was meant to be the case. Egyptian Journal of Aquatic Research, 31,45-59

This was indeed not intentional, and the reference has been updated.

-new Figure S13: might be more accessible when choosing a dotted line and full line instead of two line colors. I think this is an important Figure to illustrate your measurement approach and its effect on to the temporal signal of element ratios- you could consider making it part of the manuscript rather than supplement, but leave the choice to you.

We have amended the figure using a full line and dotted line to improve its accessibility, but decided to keep it as a supplementary figure given that the manuscript already contains a lot of figures and to prevent it from growing yet longer than it is.

In addition to the changes listed above in reply to the editorial comments, we took this opportunity to carefully read through the entire manuscript one more time and made several minor textual changes where we saw fit. All these changes were tracked in the new manuscript version using the "track changes" function in Microsoft Word.

Kind regards,

Niels de Winter

On behalf of the authors