

## ***Interactive comment on “Response of benthic foraminifera to ocean acidification in their natural sediment environment: a long-term culturing experiment” by K. Haynert et al.***

**Anonymous Referee #2**

Received and published: 5 August 2013

Dear Editor,

You asked me to review the following manuscript:

Response of benthic foraminifera to ocean acidification in their natural sediment environment: a long-term culturing experiment

K. Haynert, J. Schönfeld, R. Schiebel, B. Wilson, and J. Thomsen

The here presented study describes a long term OA experiment (6 months) with temperate benthic foraminifera within their natural habitat (silty surface sediments of the nearshore Baltic Sea). I consider the general idea of the study as quite relevant to the

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scientific community. By including sediment conditions in their study the authors aim to mimic more realistic habitat conditions for benthic foraminifera than was previously achieved by single cell (sole individual) experiments. Also I consider the presented data, methods and scope of the study as suitable for publication in BG.

However, due to serious lack of clarity, as well as severe discrepancies/incorrectness in the presented dataset, I cannot recommend the manuscript for publication in Biogeosciences as it currently stands.

Before these discrepancies have been resolved, neither a thorough review, nor publication of the here presented manuscript is possible as the data set is not defined.

The major shortcomings which prevent me from understanding the presented data are summarized in the following:

Page 9557 – 9564, Table 2 and 3:

- Beside the ‘%’ indication, it is not clear what the presented numbers actually stand for? Labels / explanation in table title, legend or the like are completely missing. I assume these tables are meant to show abundance data of the individual species for the different months of the experimental period, as explained in 3.2.1, right?

(the following is stated under this assumption)

The abundance data is incorrect and non conclusive.

Example: Page 9557 Table 2, row ‘430\_A’:

the table implies a presence of 68 individuals of *A.aomoriensis* per ‘15. cm3’ in June = ‘total number of living species’

Problems:

- These numbers are extremely low
- What does ‘15.’ mean?

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- This abundance would imply 45 individuals (instead of 449.0) per 10 cm<sup>3</sup>!

Looking at July we see 64 individuals of *A.aomoriensis* and 33 of *E.incertum* = a total of living / calcareous individuals 97 (not 67).

Additional problems:

- How can 0.3% and 0.1% of *Elphidium excavatum* exist, if there is not a single individual present?

- Severe rounding errors of the stated percentages.

These inconsistencies exist through all abundance data of Table2 and led me to believe in a 'systematic / order of magnitude error'

After consulting primary literature of 'Haynert 2013-Dissertation', available at

[http://eldiss.uni-kiel.de/macau/receive/dissertation\\_diss\\_00012460](http://eldiss.uni-kiel.de/macau/receive/dissertation_diss_00012460)

see page 145 -152, the above suspicion turned true. Species and total abundance (not population density) data in this Table2 are by an order of magnitude larger here! (I now assume all last digits are cut off in Table2 → single digits vanished completely)

Page 9561 – 9562 Table3, does not suffer from this mistake.

Unfortunately the comparison turned out additional complications:

Page 9562 - 9564 Table 3 'dead foraminiferal species':

- Starting from Page 9562 Treatment 907\_B to page 9563 Treatment 1865\_B : abundance data stated in 'Dissertation Haynert 2013' and the submitted manuscript are quite different. Abundance values changed in some instances by > 45 fold! These differences cannot be explained by the above mentioned 'digit mistake', but must have a different source. Please elaborate in a resubmission on this point.

(I expect this stems from a severe copy and paste mistake of the data strip between Table2 'living' and Table3 'dead' tests in 'Haynert 2013 – Dissertation?')

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- Starting from page 9563 treatment 1865\_C till the end of the table: data in both versions of Table 3 are in unison again.

These errors/uncertainties are logically carried over to all presented data in Figure 3 and 4 and Table S2.

The abundance data of Table 2, 3, Table S2, Figure 3, 4, however, form a major/large part (and a very important one) of the findings of this manuscript. Due to the large uncertainties rising from the above problems, a reasonable evaluation of the here presented data is therefore not possible.

Before a thorough review of this manuscript can commence, the authors need to decide which of varying datasets / versions they deem correct and justify their decision.

Yet, I encourage the re-submission of a corrected and updated version of this manuscript to BG.

Yours sincerely

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Interactive comment on Biogeosciences Discuss., 10, 9523, 2013.

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