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

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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 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?
- This abundance would imply 45 individuals (instead of 449.0) per 10 cm³!
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 individ-
ual present?
- Severe rounding errors of the stated percentages.
These inconsistencies exist through all abundance data of Table 2 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
see page 145 -152, the above suspicion turned true. Species and total abundance (not
population density) data in this Table 2 are by an order of magnitude larger here! (I now
assume all last digits are cut off in Table 2 → single digits vanished completely)

Page 9561 - 9562 Table 3, 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 : abun-
dance 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 e severe copy and paste mistake of the data strip between
Table2 ‘living’ and Table3 ‘dead’ tests in ‘Haynert 2013 – Dissertation?’)

- Starting from page 9563 treatment 1865_C till the end of the table: data is 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 pre-
sented 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

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