

Interactive comment on “Effect of increased temperature on carbon and nitrogen uptake of two intertidal foraminifera (*Ammonia tepida* and *Haynesina germanica*)” by Julia Wukovits et al.

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Review of "Effect of increased temperature on carbon and nitrogen uptake of two intertidal foraminifera (*Ammonia tepida* and *Haynesina germanica*)" by Julia Wukovits and others

Authors have tried to observe food uptake of two foraminiferal species from brackish water by laboratory feeding experiment with carbon and nitrogen isotopic labeling method. Though their experimental setup itself are not so novel, the method has been established to obtain the robust result. Even though the compound level isotope measurement was also possible to estimate the metabolic pathway, the current method is enough to observe uptake of nutrient into foraminiferal cell. Some physical separation

C1

among cell body, taken food material and its derivatives must be necessary to do such metabolism analyses. I think these will be future topic for authors.

This study succeeded to show that the energy uptake and usage are variable between studied two species (Fig. 7). Double spike of carbon and nitrogen could efficiently clarify this difference. Authors' strategy is correctly functioning. I can identify this is the major finding of the study. The authors can emphasize this point with positive tone of writing.

All topics, the carbon and nitrogen circulation in the tidal flats, the energy dynamics by meiofauna and metabolism of the foraminifera, are included in the scope of BG and are also acceptable to the reader with great interesting. The study should be published in BG. I would like to recommend authors put some summarized numbers, e.g. carbon and nitrogen flux of both species, in abstract and conclusion for readers' convenient.

P1Title: The authors find the variable usage of nutrient with two species. I think authors can reflect this finding on the title to increase the impact.

P2L20 Such influence of bacteria can be estimated by a control condition without foraminifera. L25 "microalgae" Capitalize "m"

L35 "earth?s" Fix question mark.

P3L14 Could you see reproduction event during the course of experiment?

L31 Remove psu if you follow SI unit system. How about the deviations of Temperature and Salinity? Deviations are also necessary for other measured numbers.

P4L12 This parenthesis is not closed.

L20 Add "without sediment" if there are no sediment in culture system.

L25 Could you avoid hypoxia? Mention about the DO level even qualitatively.

L29 HgCl₂, perhaps?

C2

P5Fig1 You never measure with "unusual" individuals? Show the values if you have.

P5L6 Could you show the pictures of the individuals? The color of cytoplasm visually support to know foraminiferal uptake/digestion of algae.

P6L6 All C and N is directly transferred from algae to foraminifera? I expect some of them is transferred via other small organisms what also eat labeled algae. I would like to recommend authors describe such all possible path of uptake.

How do you think about the contribution of bacterial decomposition. Discussion can be done with isotopic composition of inorganic carbon in the cultural water.

P6L22 Close this parenthesis.

P7L9 Capitalize "s"

P7L21 Put "-" between 25°C and 30°C.

P10Fig 4 Why Ammonia's results are combined? Statistically identical?

P12Fig 7 A nice discovery. *A. tepida* just stored food in cytoplasm ? Degradation is rapid in *H. germanica*? This difference between species is not revealed without ¹⁵N labeling. I can identify this is one of the key result of this study. Could you support this difference by other observation (e.g. cytoplasmic streaming, pseudopodial activities)? Include the description of observation in Result and Discussion, if so.

P13L11 (actual 11) Foraminiferal flux can not explain this? I expect *H. germanica* can quickly remineralization of carbon because the ¹⁵N:¹³C ratios show unproportional distribution. This may make ¹³C enrichment in DIC of water though the authors mentioned the influence of microbial activity. I also agree the bacterial influence, too. That would be proofed with control experiment without foraminifera in future study.

P13L27 I agree this opinion of authors. Could you observe the qualitative change of cellular volume under binocular? It is nicer if you show the pictures of individuals at 2nd and 4th day.

C3

P15L14, 15 Italicize genus name.

P15L16 I agree the authors' consideration. I thought that the descriptions of ecological observation of foraminiferal individuals under binocular are valuable to support the consideration. The behaviors of pseudopodia, appearance of individuals, the color of soft tissue and others are really important to document with isotopic measurement.

P15L23 Be not italicized "sp".

P15L24 mm² "2" should be superscript.

P16L6 Italicize "*A. beccarii*"

P16L9 Remove "." after Fig 1.

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