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Interactive comment on "The effect of salinity, light regime and food source on C and N uptake in a kleptoplast-bearing foraminifera" *by* Michael Lintner et al.

Anonymous Referee #3

Received and published: 18 September 2020

Manuscript ID: bg-2020-306 Title : The effect of salinity, light regime and food source on C and N uptake in a kleptoplast-bearing foraminifera MS Authors: Michael Lintner, Bianca Lintner, Wolfgang Wanek, Nina Keul, and Petra Heinz

Global comment: The manuscript by Lintner et al. investigates under controlled conditions the effect of salinity, light regime and food source on C and N uptake in a kleptoplast-bearing foraminifera. This is a relevant topic for all marine biologists working on benthic foraminifera species especially in brackish habitats. It will be also of interest for some biogeochemists working on forams. I found that the paper had interesting data but I had some difficulty to link the ability to deal with variable salinity and

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Discussion paper

the presence and discussion around the ability of Elphidium excavatum to keep or not functional kleptoplasts.

Major Concerns: Elphidium excavatum is now considered as a species complexes (Darling et al 2016. https://doi.org/10.1016/j.marmicro.2016.09.001). Please could you add SEM or genetic data to ascertain the species: E oceanese or E selseyense or E. clavatum .... See darling et al.. This is highly important if you want to discuss the ability of an Elphidium to use or not its kleptoplasts as there is a large difference between Elphidiidae regarding their ability to use or not their kleptoplasts (discussed in Jauffrais et al 2018. https://doi.org/10.1016/j.marmicro.2017.10.003)

In the discussion: line 331 .Please modify the use of the reference to Lopez et al. 1979, as she demonstrate that I cite Inorganic carbon "Uptake could not be demonstrated in E. excavatum." To my knowledge, there is no article that demonstrate the functionality of kleptoplast in Elphidium excavatum. In the introduction and discussion some recent and relevant articles on Elphidium, kleptoplasty and feeding behavior/strategy of forams are missing: Chronopoulou et al 2019 (https://doi.org/10.3389/fmicb.2019.01169) , Jauffrais et al 2019 (https://doi.org/10.1093/femsec/fiz046), darling et al 2016, Jauffrais et al. 2017 (https://doi.org/10.1371/journal.pone.0172678), tsuchiya et al 2020. (https://doi.org/10.3389/fmars.2020.00585), Salonen et al. 2019 https://doi.org/10.1038/s41598-019-48166-5 I have some concern with the microalgae used to feed the forams, could you argue about this choice and how much algae did you give? The experimental part is not well explained and with the actual information, it is impossible to repeat the experiments (food?, light?...). Other minor comments Introduction: Line 57 & 58: Thierry et al 2016 should be Jauffrais et al 2016. Not only H. germanica but also E. williamsoni. Not only spectral signatures but pigment composition and also DNA for E. williamsoni.

Materials Line 106: could you specify the light penetration depth in the fjord? As mentioned by many authors light history is highly important regarding kleptoplast retention

and functionality. Line 131: Could you specify the time between sampling and the experiments? Line 142: how much food did you give? Every day? Line 145: How much light did you give during the experiment? The source of light? How did you measure it? Line 151-152: the use of distilled water may cause an osmotic shock and the loss of N and C compounds. Did you observed this effect or consider it? How many forams did you used for the isotope analysis?

Results Could you increase the size of the figures. Table 2 exp 2, salinity is not mentioned and tested , why?

Discussion Line 321: you cannot extrapolate your data to all Elphidia. Line 331: please read again Lopez et al, what you wrote is not correct. Line 336. You cannot say that with your data. It seems that you are making a confusion between presence of kleptoplast and functionality. You did not measure the functionality of your kleptoplasts. To my concern, you cannot even say that they contain kleptoplasts. The presence of kleptoplast is highly variable in kleptoplastic species and in some species quickly digested. . . Line 353. According to Jauffrais et al. (2016) the number of chloroplasts plays a minor role. What do you mean? Line 368. You speak of planktonic diatom, thus when the bloom is over they are dying, so forams are feeding on dead diatoms. How can forams use this kleptoplasts?

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