Interactive comment on "Stable isotopic composition of top consumers in Arctic cryoconite holes: revealing different position in supraglacial trophic network" *by* Tereza Jaroměřská et al.

Tereza Jaroměřská et al.

jaromert@natur.cuni.cz

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Dear Prof. Bartels,

Thank you very much for your thorough comments and corrections. We really appreciate your contribution to improving our study!

Regarding your chief concern. Due to the absence of data about the exact composition of the diet of cryoconite consumers (it is the goal of our current research), we had to operate with various sources of empirical and experimental information about the feeding behaviour of studied groups. The suggestion of a higher δ15N in rotifers

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due to a feeding preference of bacteria comes partly from (1) the assumption of a 14N depletion in food for rotifers (bacteria, decomposers) compared to food for tardigrades (mostly algae) (e.g. Kling et al., 1992; Peterson and Fry, 1987; McCutchan et al., 2003) (2) the known higher content of 15N in cyanobacteria due to the fixation of atmospheric nitrogen (e.g. Gu and Alexander, 1993), (3) and from the commonly observed preference for bacterivory in rotifers. We also found a high representation of mostly herbivorous hypsibids which supports the suggestion that the majority of measured tardigrades had fed on algae (e.g. Bryndová et al., 2020). However, all knowledge about the consumers' food we have is based on laboratory experiments, studies of non-glacier species, or experiments with artificial particles. Moreover, as it is evident from the literature, there are many more factors influencing nitrogen stable isotopic ratios in various ecosystems and thus further detailed analyses are needed in cryoconite holes. Therefore, indeed, due to the lack of direct data on composition of the diet our causal explanation of the different isotopic body composition of rotifers remains speculative. We changed the text in order to make it explicit that the mechanism of heavy nitrogen increase in rotifers is an assumption based on indirect empirical data.

Regarding the carnivory of bdelloid rotifers. The only known rotifer predators in cryoconite holes are representatives of the genus Encentrum (Monogonta) which are very rare there. We did not observe any in our study. The Macrotrachella species are as far as we know always microbivores/microfiltrators.

Regarding your last comment about the correlation between cryoconite and rotifer carbon. Indeed, we do not know for sure if bacteria are the major food of rotifers causing this pattern. However, it was a logical conclusion and an indirect evidence based on the assumption of differences in carbon stable isotopic ratios related to the variability in the composition of organic matter between habitats. Moreover, it makes sense in case of tardigrades' consumption of algae which uptake atmospheric CO_2 which is the same everywhere.

Thank you very much once more and we will be pleased to continue the discussion if

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you have any further questions or concerns.

Yours sincerely,

Tereza Jaroměřská (on behalf of the other authors)

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