

Biogeosciences Discuss., referee comment RC1  
<https://doi.org/10.5194/bg-2022-98-RC1>, 2022  
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## Comment on bg-2022-98

Anonymous Referee #1

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Referee comment on "Dispersal of bacteria and stimulation of permafrost decomposition by Collembola" by Sylvain Monteux et al., Biogeosciences Discuss., <https://doi.org/10.5194/bg-2022-98-RC1>, 2022

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### General comments

The paper addresses the impact of Collembola presence on bacterial communities in permafrost soils, and its impact on CO<sub>2</sub> production, which is a relevant topic for publication in BG. Overall this is a well-written manuscript, with that is easy to follow, and the Authors do a good job in keeping a focussed approach on the main research hypothesis. I see a few aspects which need to be explained or clarified, and have provided my comments on these as well as some other suggested changes to improve clarity, see below.

### Specific comments

#### ABSTRACT

Line 20-23: this sentence is unclear. What do you mean with different treatments? Do you mean growth substrate / spraying? Also, it is not clear what it means "a number of introduced bacteria were found". Do you mean presence/ absence?

Line 25: how was estimated that 13.22% of CO<sub>2</sub> production was a result of priming effect by collembolan? Shortly explain it here.

Moreover, it is not clear if there is a different effect of collembola on permafrost vs. topsoil, both in terms of CO<sub>2</sub> production and bacterial community.

#### INTRODUCTION

- Line 36: can you add reference for this sentence?
- Line 74: The research gap you are trying to fill should be more clearly addressed, in order to better link this paragraph with the next one (from line 75-80). Here you write "To our best knowledge, this has not been explored yet". However, it is not clear what exactly has not been explored. Could you clarify it here?
- Line 75: it would be useful to clarify where the Yedoma domain is located
- Line 81: At point 1, I would specify the collembola presence in permafrost/topsoils

#### RESULTS

- Figure 2: write out in the figure caption the full meaning of the abbreviation ASVs
- Line 264-266: where are the results shown? Add reference to Figure or Table in main

text or Appendix

- Appendix A1: clarify that "RM-ANOVA" means repeated-measures ANOVA

#### DISCUSSION

- Line 340-343: unclear sentence, which could be shortened (e.g. three studies)

#### Technical corrections

- 31: "soil fauna are" to "soil fauna is"
- 32: "this decomposition" to "organic matter decomposition"
- 40: "they" to "collembola"
- 43: consider about shortening the sentence "often considered from the perspective of the huge...."
- 45: "such organisms such as" to "organisms such as"
- 47: consider about shortening the sentence : "Despite this particularity, in the very active field of permafrost research the absence ...."
- 65. "In active layer deepening" to "with the deepening of active layer"
- 289: "It may be that ..." to e.g. "this could be attributed..."
- 340: "their effect"? Could you check this, it is unclear to what the effect it is referred to.