

Biogeosciences Discuss., referee comment RC1
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Comment on bg-2022-98

Anonymous Referee #1

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

General comments

The paper addresses the impact of Collembola presence on bacterial communities in permafrost soils, and its impact on CO₂ 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 CO₂ 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 CO₂ 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.