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Extended Plant Metarhizobiome: Understanding Volatile Organic Compounds Signaling in Plant-Microbe Metapopulation Networks

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Transaction Report:

(Note: With the exception of the correction of typographical or spelling errors that could be a source of ambiguity, letters and reports are not edited. The original formatting of letters and referee reports may not be reflected in this compilation.)

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Prof. Wei Zhong
College of Resources and Environmental Sciences, Nanjing Agricultural University
Nanjing
China

Re: mSystems00849-21 (Extended Plant Metarhizobiome: Understanding Volatile Organic Compounds Signaling in Plant-Microbe Metapopulation Networks)

Dear Prof. Wei Zhong:

Reviewer comments are found at the end of this letter.

Your minireview is likely to be accepted once the indicated changes are made.

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Sincerely,

Heather Bean
Editor, mSystems

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Reviewer comments:

Reviewer #1 (Comments for the Author):

The paper is much improved with this draft. The expansion of references to support the presented ideas was just what was needed.
There are a number of minor grammatical errors that should be cleaned up, such as agreement of number between subject and verb, and choice of prepositions to clarify the relationship between clauses. Details are provided in the attachment.

Reviewer #2 (Comments for the Author):

The authors have addressed most of the comments raised by the referees. The authors have softened several of the hypotheses proposed in the previous version of the manuscript and have included a number of new references that provide experimental support to the hypotheses

presented in this mini-review. The manuscript reads well and I only have minor comments on this manuscript.

- Line 52: pathogenic microorganisms have not been listed within the rhizosphere microbial community.
- Line 92: Change "VOCS" to "VOCs"
- Line 298-299: As indicated in previous evaluation reports, VOCs emission by plants and/or rhizospheric (micro)organisms will not cause an increase in the total volume of the rhizosphere, but affect the metabolism/physiology of (micro)organisms beyond the rhizosphere environment.

Third review of Raza et al.

L52. Do references 2-4 cover suppressive soils? I don't have these references handy, but don't see anything that obviously supports microbial disease suppression. There are hundreds of references to choose from.

L196. Nothing can be 'more unique' or less unique. If it is unique, it is the only thing like it.

L212-213. 'In this case, also the rare microbiome (taxa present in low relative abundances) could be important as already small concentrations…' Should be simplified to 'In this case, taxa present in low relative abundances could be important contributors as low concentrations…'

L243-244. I suggest changing, 'This could potentially allow myriad of interactions and generally larger plant-rhizobiome networks.' to 'This could potentially result in a large range of interactions across generally larger plant-rhizobiome networks.'

L273-275. Suggestion: 'blurring the plant control on the rhizobiome' to 'blurring the boundary of plant control over the rhizobiome'. Similarly, plant root VOCs can influence rhizosphere microbial community composition (15, 72) and this effect could extend to…'

L277-278. 'while plants can in turn attract natural enemies of herbivores by emitting herbivore-induced plant VOCs'

L299-301. I suggest changing 'For example, identifying potential keystone microbial species that have relatively strong VOC-mediated interactions at the community level could be potentially used as microbial inoculants, while VOC-mediated interactions could be especially important in intercropping.' to 'For example, identifying potential keystone microbial species with relatively strong VOC-mediated interactions at the community level that could be used as microbial inoculants could be especially useful during intercropping periods.'

L306. It is highly unlikely that any naturally-produced VOC could be used as a biofumigant, in part because of some of the points you have made in the manuscript, but mostly because anything toxic enough to fumigate a soil environment is likely to be nondiscriminating in its killing, and if not so toxic, then unlikely to eliminate pathogens. In our experience VOCs are static agents rather than cidal, so once the agent is removed one would expect rapid recovery of the target populations. However, the idea has merit not as a fumigant but perhaps as a way to give seedlings a chance to establish in the presence of seedling disease fungi. Perhaps changing 'biofumigant' to 'a transient and ecologically compatible biological control agent' or 'an ecologically compatible stimulant of the plant's immune system' would suffice.

L310-311. Why not just say something like, '…a combination of existing and emerging omics and computational technologies' rather than giving a list that is likely to be soon outdated or that leaves out an important 'omics', like 'volatilomics'?

L337. The sentence doesn't make sense. I think the wrong word was deleted.

August 9, 2021

Prof. Wei Zhong
College of Resources and Environmental Sciences, Nanjing Agricultural University
Nanjing
China

Re: mSystems00849-21R1 (Extended Plant Metarhizobiome: Understanding Volatile Organic Compounds Signaling in Plant-Microbe Metapopulation Networks)

Dear Prof. Wei Zhong:

Your manuscript has been accepted, and I am forwarding it to the ASM Journals Department for publication. For your reference, ASM Journals' address is given below. Before it can be scheduled for publication, your manuscript will be checked by the mSystems senior production editor, Ellie Ghatineh, to make sure that all elements meet the technical requirements for publication. She will contact you if anything needs to be revised before copyediting and production can begin. Otherwise, you will be notified when your proofs are ready to be viewed.

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Sincerely,

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