

sDiv working group meeting report

"sPSF"

Working group overview and meeting summary

The overarching goal of our working group is to synthesize theory and data to enable predictions of global change impacts on microbially mediated plant dynamics. During our first meeting, we had established two core projects towards this goal. The first is a meta-analysis to evaluate whether plant root traits relate to individual species performance, and whether these traits help predict the outcome of species interactions. The second project aims to develop a trait-based theoretical framework that integrates the effects of abiotic variation and soil microbial impacts on plant community dynamics. During this second meeting, we made substantial progress on both projects. For the meta-analysis, we finalized our dataset (including conducting a fresh round of database searches to identify new studies that were published since our last search), and all participants have agreed on a structure for the statistical model. For the theoretical paper, we had substantial discussions on the best approach to link theory and empirical requirements. Following this, we established the structure and approach to the problem, agreed on a set of equations governing plant-microbe communities, and have a working draft of the code for simulations.

Structure of the working group meeting

Seven out of eight participants were in-person at Leipzig for our meeting, while one participant (Yadugiri VT) joined remotely from India. We began the week with a whole-group "plenary" type session in which the PIs led presentations sharing updates and all participants discussed both projects. On the following days, most of our time was spent working in separate small groups on the two projects. To ensure that all group members remained fully abreast of progress on both projects, we ended each day with a whole-group check-in where designated reporters from each group shared that day's progress/roadblocks and plans for the next day, with deep discussions of each project. Group members largely concentrated their time and efforts on the same project over the week, though some group members did choose to switch between projects. We found this structure to be quite efficient, as it enabled substantial progress on both projects while also allowing all group members to contribute to both efforts.

Next steps and upcoming deliverables

Given the substantial progress we made on both projects, and the relatively clear path for progress, we feel confident that both projects can be submitted for publication by early-2024. To help achieve this goal, we devoted some time on the final day of the working group meeting to collectively develop a schedule for the next few months, which includes small-group zoom calls as well as whole-group check-ins. We also had open conversations about who will act as first/co-first authors for the two projects. Both subgroups aim to have a core set of results for the manuscripts developed before the 2023 winter holidays, which will be

shared with all group members. We also agreed that our group would greatly benefit from an additional in-person meeting in ~March 2024, which we would use as a writing retreat to help finalize and submit both papers.

Other working group outcomes

In addition to the two core projects, this working group has also helped foster a number of collaborations between group members that otherwise would not have been possible. For example, based on conversations at the first working group meeting, group members Meghna Krishnadas, Adriana Corrales and Gaurav Kandlikar proposed a Special Issue on plant-microbe interactions in tropical and subtropical systems for the American Journal of Botany. Submissions for the Special Issue are expected in October 2023. There are several other such collaborative efforts that we expect to be coming to fruition in 2024.

Logistics and sDiv support

All working group logistics worked well, thanks to the many efforts of the sDiv staff. We found June to be a wonderful time to work and visit Leipzig. We were also deeply grateful to Yadu for participating very actively despite the time zone differences between Germany and India. We hope to have a third in-person meeting where all members can gather.