

sDiv working group meeting report

"sConsume II"

Working group meeting report

The second meeting of the "sConsume" working-group was held from the 17th to 21st March 2025 at iDiv, Leipzig. This was attended in-person by nine participants and remotely by one participant.

The goal of this second meeting was to follow-up on and test the framework for plant diversity-consumer relationships that was created in the first meeting and subsequently published in the journal *Trends in Ecology & Evolution* (Halliday, F. et al. 2025). At our second meeting, we began to confront our recently published conceptual framework with empirical data from four separate experiments: The Jena Experiment, The Nutrient Network, PaNDiv, and BugNet. The four existing datasets provide an opportunity to explore how our framework applies to empirical systems in which biodiversity is manipulated locally (Jena; PaNDiv) versus occurs naturally in a globally distributed experiment (NutNet; BugNet), as well as experiments that manipulate nutrients (NutNet; PaNDiv) or do not (Jena; BugNet). Group participants, who collectively curate these datasets, devoted time before the meeting to prepare the data for a standardized set of analyses. A large portion of our second meeting was devoted to discussing details of how to implement these analyses, including both a generalized approach that would work for all four datasets and specialized approaches tailored to each experiment independently.

The group delved right into discussions regarding testing the framework with the data in hand. A majority of the first day was spent in discussing how to harmonize variables across datasets, create composite variables, and choose the relevant scales for analyses (species vs community). We also discussed each predictor and response variable in detail, parsing out what they actually mean vis-à-vis biodiversity-consumer interactions. Subsequently, we broke-up into smaller groups to perform specific analytical/data tasks. Over the next couple of days, we really dug deep into the analyses coming back together as a group frequently to discuss any road-blocks we encountered. For example, this included an in-depth discussion on how plant-diversity is related to structural complexity of the vegetation, how we expect structural complexity to affect consumer damage, and finally, how best to quantify structural complexity with the data available across datasets.

After a couple of days of data wrangling, the different sub-groups brought the results of their analyses to the whole group. Thereafter, we spent a considerable time identifying commonalities and insightful points-of-departure across the different datasets. In between the deep dives into data and analyses, we also took time out to discuss other possible

manuscripts that could come out of these datasets, and the possibilities of having a postdoc join our group to really pursue some of these ideas.

Next steps and upcoming deliverables

One important dichotomy that emerged in our recent TREE paper – which was also recapitulated in discussions at our second meeting – is that different factors may regulate damage at the plant species scale versus plant community scale. In other words, a subset of the fundamental factors that we propose matter for damage at the level of a plant species seem likely to affect damage at the scale of the entire plant community. Through group discussions at our second meeting, we realized that it is not clear how 1) Density of a Focal Plant maps on to the community level damage. Consequently, it became clear to us that while we were ready to begin applying our framework to analyze community-level damage in these four experiments, we were not ready to apply our framework to damage at the plant species scale. By the end of the second meeting, we generated preliminary results of applying our framework to damage at the community scale in three of the four experiments. We envision that these analyses, once complete, will be the topic of the second paper which we write as a group. We spent the last day of the meeting chalking out plans on how to move forward – this included requesting some early review of the analyses and interpretation by senior experts in the field who are PIs of the experiments we have used data from. Our goal is to have a full draft of this manuscript by February 2026.

The group also expressed enthusiasm for a potential third meeting in March 2026 to follow up on ideas discussed in the second meeting. The primary goal of the third meeting would be to conceptually and analytically grapple with the question of how to apply our framework to consumer damage at the plant species scale. We envision this to take the form of a third manuscript arising out of our working group.

We would like to take this opportunity to once again thank sDiv for all the help and support in making our first two meetings highly productive and fun. We look forward to hopefully another meeting at iDiv in 2026.

Best wishes and thanks,

sConsume