Working title:
Is herbivory contagious? The spatial pattern of herbivore damage within plant populations across the globe

Lead:
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Co-leaders:
HerbVar Steering Committee

Abstract:
A common perception among ecologists is that ecological processes have a strong degree of spatial autocorrelation. This assumption underlies much of associational effects theory, an important body of work in plant-herbivore biology that explores how the level of herbivore damage received by a plant is influenced by how its neighbors interact with herbivores. Despite the wide importance of these ideas, we have a poor understanding of how strong spatial autocorrelation in herbivory is in natural systems and no studies have examined how its strength varies across systems with key ecological and environmental variables such as latitude, biome, plant traits, or plant phylogeny. In this project we will analyze the spatial data in the core HerbVar data set, including both the neighbor relationships and spatially explicit location data. We seek to answer two questions: (1) How strong is spatial autocorrelation in herbivory on average? (2) What factors predict how the strength of spatial autocorrelation varies across systems? Answers to these questions will advance our understanding of the spatial aspect of plant-herbivore ecology and reveal what factors may make associational effects more or less important among genotypes within plant species.

Data:
Core HV dataset, combining phase 1 and phase 2

Response variables:
Herbivore damage per plant
Herbivore damage per leaf
Variability in damage within plants

Predictor variables:
Neighbor relationships
Spatial locations
Phylogeny
Latitude
Plant size
Others…

Authorship model / plan for recruiting additional authors:

All HV Site PIs will be included as co-authors because this is a core paper. I will involve co-authors in the analysis and writing process using Google Forms for collecting co-authors ideas and feedback. We may also have a virtual meeting to discuss the paper.

Timeline:
Data cleaning May - Aug 2024
Analyses June 2024 - Apr 2025
Writing Apr - Aug 2025
Submission by Oct 2025