

Working Title: Variability in herbivore damage to reproductive structures

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Co-Leaders: HerbVar Steering Committee

Abstract: Although research on herbivory has historically focused on leaves, plants face threats from numerous consumers that specialize on different plant parts, including flowers, fruits, and other reproductive structures. Compared to leaves, reproductive structures are often highly nutritious, ephemeral, composed of multiple tissue types, and primarily damaged by specialist herbivores. Damage to reproductive structures can affect their attractiveness to pollinators and seed dispersers and have direct consequences for plant fitness when potential offspring are destroyed. Yet, we have a limited understanding of the extent and variability in reproductive damage across plant species and ecosystems. In this study, we will use data from the HerbVar network focused on surveying damage to reproductive structures to ask the following questions: 1) How is reproductive damage distributed within and across plants in a population? 2) How does the distribution of reproductive damage compare to that of leaves? 3) How do abiotic conditions shape the distribution of damage to reproductive structures? and 4) How do plant traits shape the distribution of damage to reproductive structures? By quantifying the patterns and variation in reproductive damage, both within and across plants, this study will improve our fundamental understanding of species interactions, plant population dynamics, and the selective pressures shaping plant traits over evolutionary time.

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

Response variables:

Reproductive damage per plant

Reproductive damage per structure

Leaf damage per plant

Leaf damage per structure

Variability in damage across structures within plants

Variability in damage across plants within populations

Predictor variables:

Phylogeny

Latitude

Biome

Climate variables

Structure type (leaf, flower, fruit, seed, etc)

Number of structures

Plant size

Growth form

Others...

Authorship model: Opt-in: Limited. All HV Site PIs that collect and contribute **reproductive data** will be invited to join as co-authors. We will involve coauthors 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

Conception and planning: 2024

Data collection: 2025-26

Data processing and analyses: 2026

Writing: 2026-27

Submission: Early 2027