Resource Avail/Apparency

Species-dependent apparency across XX plants

Limitation of this study is limited herbivory species.

Extreme example such as Stone plants avoid herbivores by blending in with their environment.

But we did not include such species in our study.

Figure2.  The solid line and shaded area show Linear Mixed Model (LMM) (b) and Generalized LMM (d) predictions and their 95% confidence interval

Results

10 plant genera belong to 9 plant families across four states in the United States were selected in present study. The proportions of leaf damage by herbivores ranged from 0-50.4%, and varied greatly across different plant genera. On average, *Bidens alba* suffered the greatest proportions (15.1%) of herbivore-induced damages, followed by Salix, Zea, Solidago, Solanum, Citrus, Litchi, Asclepias, Ligustrum, and with Raphanus being the least damaged plant species.

Fig1. The proportions of herbivore-induced leaf damage of ten plant genera sampled at ten sites. The data were analyzed using ANOVA followed by Tukey post hoc tests with Bonferroni correction. The statistical significance was annotated by asterisk. \*\*\*\*, *P*<0.0001; \*\*\**P* <0.001; \*\**P* <0.01; \* *P*<0.05.



Methods

Sampling

A class project involving 17 students and 1 instructor at University of Florida sampled the data at nine different sites across three states in the United States. The plant samples and the leaf damage were sampled from September to October in year 2020. The data contain 10 plant genera ranging from urban area, to agriculture habitat, and to open disturbed teaching unit. The Primary HerbVar Survey Protocol was applied in the entire study. In brief, 20 plants were randomly chosen at each sample site. Subsequently, the plant life stage (seedling, vegetative and reprodutive), plant height, total number of leaves, and the herbivore damage of 10 samples of leaves were recorded. For herbivore damage quantification, we applied two approaches. The first approach is visually estimating the herbivore damage per leaf. Another approach is using software BioLeaf (Android system) or LeafByte (IOS system) (Cite) to estimate the proportion of damage per leaf. The later approach was used as standard reference for calibration during the visual sampling. Presence or absence of plant diseases, the number of leaf mines, galls and herbivores such as grasshoppers, caterpillar, hoppers, aphids and whitefly/mealy bug/scale were also scored in some plant species.

Statistical analyses

All data analyses were conducted in the computer programming R (Version 4.0.1). The pairwise comparisons of proportional leaf damage of plant genus were analyzed using ANOVA followed by Tukey post hoc tests with Bonferroni correction depending on the results of a Shapiro-Wilk normality test. To test the hypothesis that whether the plant heights are correlated with plant leaf damage, the data were fitted into a linear model, a generalized linear model (GLM) with gaussian distribution, and a generalized mixed effects model (GLMM). Type II Wald chisquare tests of the GLM or GLMM were performed using function “Anova” implemented in R package car (Version 3.0.10). The statistical outcomes such as p-values, coefficient of determination and AIC of linear models for each plant genus were conducted in R package ggpmisc (Version 0.3.6). All figures were plotted with R package gglot2 (Version 3.3.2).