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# Percentage leaf herbivory across vascular plant species

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*Abstract*. Herbivory is viewed as a major driver of plant evolution and the most important energy pathway from plants to higher trophic levels. Therefore, understanding patterns of herbivory on plants remains a key focus in evolution and ecology. The evolutionary impacts of leaf herbivory include altering plant fitness, local adaptation, the evolution of defenses, and the diversification of plants as well as natural enemies. Leaf herbivory also impacts ecological processes such as plant productivity, community composition, and ecosystem nutrient cycling. Understanding the impact of herbivory on these ecological and evolutionary processes requires species-specific, as opposed to community-level, measures of herbivory. In addition, species-specific data enables the use of modern comparative methods to account for phylogenetic non-independence. Although hundreds of studies have measured natural rates of leaf consumption, we are unaware of any accessible compilation of these data. We created such a data set to provide the raw data needed to test general hypotheses relating to plant–herbivore interactions and to test the influence of biotic and abiotic factors on herbivory rates across large spatial scales. A large repository will make this endeavor more efficient and robust. In total, we compiled 2641 population-level measures for either annual or daily rates of leaf herbivory across 1145 species of vascular plants collected from 189 studies. All damage measures represent natural occurrences of herbivory that span numerous angiosperm, gymnosperm, and fern species. To enable researchers to explore the causes of variation in herbivory and how these might interact, we added information about the study sites including: geolocation, climate classification, habitat descriptions (e.g., seashore, grassland, forest, agricultural fields), and plant trait information concerning growth form and duration (e.g., annual vs. perennial). We also included extensive details of the methodology used to measure leaf damage, including seasons and months of sampling, age of leaves, and the method used to estimate percentage area missing. We anticipate that these data will make it possible to test important hypotheses in the plant–herbivore literature, including the plant apparency hypothesis, the latitudinal-herbivory defense hypothesis, the resource availability hypothesis, and the macroevolutionary escalation of defense hypothesis.

*Key words: browsing; climatic variation; defoliation; folivory; global census; grazing; latitudinal gradients; leaf age; leaf consumption; plant–herbivore interactions; primary consumption; trophic interactions.*



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