Oecologia
October 2013, Volume 173, Issue 2, pp 473-482

Attracting pollinators and avoiding herbivores: insects influence plant traits within and across years

By: Amanda Lynn Buchanan, Nora Underwood

Abstract

Perennial plants interact with herbivores and pollinators across multiple growing seasons, and thus may respond to herbivores and pollinators both within and across years. Joint effects of herbivores and pollinators influence plant traits, but while some of the potential interactions among herbivory, pollination, plant size, and plant reproductive traits have been well studied, others are poorly understood. This is particularly true for perennial plants where effects of herbivores and pollinators may manifest across years. Here, we describe two experiments addressing the reciprocal interactions of plant traits with herbivore damage and pollination across 2 years using the perennial plant *Chamerion angustifolium*. We measured (1) plant responses to manipulation of damage and pollination in the year of treatment and the subsequent season, (2) damage and pollination responses to manipulation of plant size and flowering traits in the year of treatment, and (3) plant-mediated indirect interactions between herbivores and pollinators. We found that plant traits had little effect on damage and pollination, but damage and pollination affected plant traits in both the treatment year and the subsequent year. We found evidence of indirect effects between leaf herbivores and pollinators in both directions; indirect effects of pollinators on leaf herbivores have not been previously demonstrated. Our results indicate that pollen receipt results in shorter plants with fewer stems but does not change flower number, while leaf herbivory results in taller plants with fewer flowers. Together, herbivory and pollination may contribute to intermediate plant height and plants with fewer stems and flowers in our system.