

Herbivory could be making life difficult for a rare alpine plant in Yosemite National Park

Self-Fertilization and Herbivory in a Rare Alpine Plant in California, *Claytonia megarhiza* (Montiaceae)

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Significance: This study provides new information about the reproduction of a rare alpine plant species, *Claytonia megarhiza*. This information can support protection and conservation of this species.



Figure 1: *Claytonia megarhiza*, commonly known as “alpine spring beauty”. Source: CalFlora, 2009 Ron Wolf.

Herbivory may limit the reproduction of *Claytonia megarhiza*, a rare alpine species that can be found in the mountains of western North America.

Alpine environments are a difficult place for plants to live in. Specifically, low temperatures, wind, short growing seasons, limited availability of pollinators, and herbivory make reproduction challenging.

Dena Grossenbacher was studying rare plants in Yosemite National Park when she noticed animals – specifically, ants – visiting the flowers of *C. megarhiza*. In alpine environments, animals can

affect plant reproduction in two ways. As pollinators, animals help plants sexually reproduce by transferring male pollen from one flower to the female parts of another flower, which leads to the fertilization and production of seeds. As herbivores, animals can limit the plant reproduction such as by eating flowers or shortening the amount of time that the plant produces flowers. Grossenbach was curious about whether these ants might be affecting the reproduction of *C. megarhiza*.

She teamed up with two other researchers to study the impact of animals (ants, other crawling insects, flying insects, and vertebrates) on the reproduction of a single population of *C. megarhiza* in Yosemite National Park.

The researchers found that the presence of animals negatively impacted the reproduction of *C. megarhiza*. Specifically, plants produced less fruit and had more leaf damage when animals were present. There was not enough evidence to determine if ants and other crawling insects were acting as pollinators or herbivores. When animals were absent, *C. megarhiza* still produced fruit, which suggested that the species could undergo self-fertilization.

Grossenbacher says these findings can help managers protect existing populations and establish new populations of this species in the future.

More work is needed to understand how this plant reproduces with or without pollinators. If Grossenbacher could do the experiment again, she would change the design of her experiment to better understand how fruit production and leaf damage are affected by variables in the study. She would also expand the study to include more than one population of *C. megarhiza*.