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OPEN-TOP WARMING CHAMBERS REDUCE ANIMAL POLLINATION OF TWO SUBALPINE HERBS

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Open-top chambers (OTCs) are a method for studying the effects of climate change on plant performance through passive warming. They are widely used due to their efficacy, cost-effectiveness, and ease of deployment. However, little is known about their effects on pollination, which is concerning since negative effects could lead to unintended reproductive side effects. Our study aimed to determine whether the effects of OTCs on plant reproduction might be confounded with their impact on pollinators

We placed OTCs in a subalpine meadow near the Rocky Mountain Biological Laboratory in Gothic, Colorado, observing pollinator visitation rates to flowers both inside and outside of the chambers. Our study species were two perennials – dwarf larkspur (*Delphinium nuttallianum*) and cinquefoil (*Potentilla pulcherrima*) – which each have different pollinators. We collected stigmas from both species inside and outside of chambers to obtain pollen counts.

In both species, we found that flowers inside of the OTCs had significantly lower pollinator visitation rates than flowers outside. Additionally, there was less pollen on the stigmas of *Delphinium* flowers that had been in OTCs. The same was not true in *Potentilla*, possibly because the species is capable of self-pollination.



Open-top warming chambers (OTCs) deployed in a subalpine meadow near the Rocky Mountain Biological Laboratory

Our results demonstrate that open-top warming chambers can reduce animal pollination, possibly by acting as a physical barrier to insect pollinators. We suggest that studies using OTCs to investigate the effects of climate change on plant reproduction should exercise caution to avoid confounding the warming effects of OTCs with their pollination effects