

## AN UPDATED INSECT EXCLOSURE DESIGN FOR POLLINATION ECOLOGY

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Floral enclosures, or structures that act to inhibit animals from visiting flowers, are commonly used to determine various effects that insects or other animals have on plants.

With climate change having significant impacts on ecosystems, information obtained from this type of study can be valuable for informing conservation practices.

These types of studies are important for monitoring plant-pollinator relationships over time and are especially important considering climate change has drastic impacts on these systems. However, past studies have used a variety of terms to refer to enclosures, and/or do not give clear descriptions of enclosures. This practice decreases replicability of pollination studies and could inhibit scientific progress in the field.

We summarized previous descriptions of pollinator enclosures in the literature, and field tested an updated design on the Beartooth Plateau, located north of Yellowstone National Park, USA. These enclosures were left on the plateau for the duration of the alpine growing season and

monitored daily. Over 95% of our enclosures remained in place, despite being subjected to extreme weather conditions. Enclosures meant to inhibit pollination worked, with flowers in these enclosures producing fewer fruit. The design was also lightweight, cost-effective, easy to produce, and could be used in many ecosystems. The combination of these findings makes our enclosure design useful for future pollination ecology studies. We also bring to light the issue of repeatable methods, and hope that future studies using enclosures will include the information necessary for replication.



*Exclosures on an alpine meadow, Beartooth Plateau, Montana/Wyoming Border, USA*