

## News & Comments

# Plant Coexistence is Destabilized by Pollinator Competition

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As pollinating insects decline, plants may become less diverse due to competition for attention

Pollinator species such as honeybees and butterflies are declining around the world. Studies have suggested that fewer pollinators will pollinate plants and produce fewer seeds due to this decline in pollinators.

Throughout history, scientists have documented the lengths to which plants will go to attract pollinators, such as their showy petals and sepals, along with specific scents called pheromones.

Despite the fact that many pollinators such as bees and butterflies frequent different plant species, a new [study](#) suggests that the decline of these insects might destabilize coexistence.

As pollinator numbers continue to decline, it is unclear how this will affect plants.

Scientists set up a series of plant plots in Switzerland to investigate how manipulating plant competition for pollinators would affect plant coexistence. They wanted to find out whether a species can maintain itself when it's rare and its competitors are dense.

The importance of plant coexistence can be seen in the fact that there is a decrease in plant diversity when plants can't exist alongside each other.

The researchers controlled how much pollination happened by hand in some plots using 80, 2.25 m<sup>2</sup> plots of paired Swiss annual plant species. Pollination levels in the rest of the environment had to be based on normal environmental factors. In their study, Chris Johnson and his colleagues compared fitness measurements and population measurements.

To simulate pollinator decline, 22 replicate plots with half exposed only to one pollinator species were enclosed. A measure of floral visits by pollinators was also taken for these plots.

According to Johnson and colleagues in their paper, competition for pollinators weakened the stability of niche differences among competitors in nine of ten species pairs. When pollination was reduced, the species didn't adjust their interactions with each other within the shared pockets of the environment to achieve a new balance.



A mathematical model showed that pollinator competition reduced the number of plants that could coexist - based on the number of viable seeds produced - and therefore reduced the diversity of plants. Johnson suggests that there may be a number of reasons for this. It's possible that pollinators favor attractive plants or a common species, and they're benefiting those plants at the expense of others."

Pollination does destabilize coexistence, according to the authors. Despite the results not being surprising, the combination of theory and empirical data used to demonstrate them is a major advance. The results are unsettling given pollinator declines around the world.

#### **KEYWORDS**

Community ecology, Plant ecology, bees, insects, pollinator, insects, butterfly

