

Flower Pollination

One of the largest and most successful groups of plants is the angiosperms, or flowering plants. (For purposes of contrast, examples of plants that do NOT fall into this group include conifers, mosses, ferns, and lichens.) Like animals, flowering plants reproduce sexually by producing sperm and egg cells. The male structures of the plant are collectively called the stamen and the female structures the pistil. Depending on the species of plant, flowers may include only male structures, only female structures, or both. The flowers shown in the examples in the pollination Gizmo contain both the male and female structures in a single flower.

The vast majority of flowering plants cross-pollinate, usually relying upon an animal pollinator to deliver pollen between plants. Many of these pollinators are insects, like butterflies and bees, but birds, bats, and even lizards can fill the role. The benefit for the pollinator is often a meal in the form of nutritious nectar contained deep within the flower. The insect first gets dusted with pollen while diving for the nectar on one plant, then deposits the pollen on the sticky stigma of a second plant while looking for a meal there.

Plants have evolved a variety of adaptations to attract pollinators. While the patterns on a flower's petals can invoke the perception of beauty in human observers, to an insect those patterns often map the route leading to a good meal. Insects are far more perceptive of UV (ultraviolet) light than humans are, and the appearance of a flower can be quite different when photographed using UV technologies. A flower's distinctive scent might also help to attract potential pollinators.

Historical Connection

Gregor Mendel is famed as the founder of modern genetics. His work was built upon a series of experiments involving cross-pollination in pea plants. To carry out his experiments, Mendel had to control each cross.

Mendel carefully snipped the anthers from each female parent, and used a tiny paintbrush to collect pollen from the male parents to transfer to the female parents. In doing so, Mendel was essentially playing the role of an insect in the pollination process. To prevent contamination of his crosses, Mendel wrapped each flower in a small sack.

Environmental Connection

The United States is currently experiencing an alarming decline in both its wild and its commercial honey bee population. This is a serious problem because honey bees are responsible for pollinating up to 30% of the nation's food supply. Crops that depend on the honey bees include apples, peaches, soy beans, carrots, broccoli, almonds, and many others. California almond growers, responsible for 80% of the world's almond supply, have taken to trucking bees in from other areas.

There appear to be several reasons for the decline in honey bee populations—among them a parasitic mite and the use of pesticides on crops. Unfortunately, the same pesticides that can reduce the damage caused to plants by insects can also impact insects that are critical for the plants' pollination.

Selected Web Resources

Interactive site on all aspects of plant life: <http://www.urbanext.uiuc.edu/gpe/index.html>

Flower dissection lab: <http://www.middleschoolscience.com/flower.pdf>

Gardening with kids: <http://www.kidsgardening.com/>

Growing peppers: <http://www.flower-and-garden-tips.com/growingpeppers.html>

Plant biology: <http://www.mbgnet.net/bioplants/main.html>

Animals as pollinators: http://www.smithsonianeducation.org/educators/lesson_plans/partners_in_pollination/index.html

Plant photos in visible and UV light: http://www.naturfotograf.com/UV_flowers_list.html

Comprehensive site on Gregor Mendel: <http://www.mendelweb.org/>

Bee population decline: <http://www.npr.org/templates/story/story.php?storyId=6299480>