**Relationship Between Plants and Pollinators**

***Entomophilous flowers*** are those flowers that require pollination by insects. Insects have been pollinating flowers for over 100 million years. In fact, plants have coadapted with insects creating a complex network of interactions. To compete for the attention of pollinators, flowers have evolved ingenious methods to entice hungry bees, birds, moths, butterflies, and beetles to inadvertently act as pollen-carrying liaisons between blooms that would otherwise never touch. The amazing diversity of flowers results from their unique adaptations to lure a range of pollinators.

***Flowers communicate with their pollinators by scent.*** *Insects use this scent to determine how far away a flower is, how to approach it, and to identify where to land and finally to feed.*

**Flowers attract insects with patterns of stripes leading to the rewards of nectar and pollen, and colors such as blue and ultraviolet, to which their eyes are sensitive.** *In contrast, bird-pollinated flowers tend to be red or orange.*

**Flowers such as some orchids mimic females of particular insects, deceiving males into pseudo copulation.** *Talk about your chemistry!*

**Flowers' shapes are important for protecting pollen, attracting or precluding certain pollinators, or ensuring that pollen is picked up and transferred**. *For instance, butterflies tend to prefer flat, open surfaces with views (e.g., zinnias), while certain bees seem to like those with special petals that serve as landing platforms (e.g., delphiniums). Open, bowl-shaped flowers (e.g., poppies) can be easily seen by and offer warm access to short-tongued insects such as honeybees and wasps. Drooping, bell-shaped flowers protect their sexual parts from weather and offer food and shelter for honeybees and bumblebees, who can feed while hanging. Some flowers, such as snapdragons, have hinged petals or other mechanisms, to conceal their sexual parts and nectar. They are closed to all but selected pollinators (in this case, certain bees) who have the dexterity, strength, and tenacity to open the flower. Many flowers have shiny patches of ultraviolet on their petals called bee guides or nectar guides. Like airport runway lights, these ultraviolet regions guide the bees to the nectar.*

**Some flowers are pollinated exclusively by a single species of insect.** *Yucca whipplei is pollinated exclusively by Tegeticula maculata, a female yucca moth that depends on the yucca for survival. The moth eats the seeds of the plant, while gathering pollen. The pollen has evolved to become very sticky, and remains on the mouth parts when the moth moves to the next flower. The yucca provides a place for the moth to lay its eggs, deep within the flower away from potential predators. Also, each fig species has its own fig wasp which (in most cases) pollinates the fig, so a tight mutual dependence has evolved and persisted throughout the genus.*

**Pollinator Preferences**

Bees — Yellow, blue, purple flowers; there are hundreds of types of bees that come in a variety of sizes and have a range of flower preferences;

Butterflies — Red, orange, yellow, pink, blue; they need to land before feeding, so like flat-topped clusters (e.g., zinnias, calendulas, butterfly weeds) in a sunny location;

Moths — Light-colored flowers that open at dusk (e.g., evening primroses);

Beetles — White or dull-colored, fragrant flowers since they can't see colors (e.g., potatoes, roses);

Flies — Green, white, cream flowers; many like simple bowl-shaped flowers or clusters;

Carrion-eating flies — Maroon, brown flowers with foul odors (e.g., wild ginger);

Ants — Although ants like pollen and nectar, they aren't good pollinators, so many flowers have sticky hairs or other mechanisms to keep them out.

**The ultimate fate of many plants may depend on preserving their relationships with pollinators.** *Ensure that your pollinators don’t practice Social Distancing…*

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