

Marin Chapter
California Native Plant Society
www.cnpsmarin.org

WHAT MIGHT BE POLLINATING MY PLANTS?

Although careful study is needed to determine the most effective pollinators of each plant, each kind of flower tends to attract certain kinds of visitors more than others. Many years ago, naturalists discovered that in the most common associations, particular flower traits seem to “fit” particular features of the animals that visit them. Each group of flower and animal characteristics became known as a “pollination syndrome” and is likely the result of reciprocal evolution in the animals and the plants. Here are examples of some pollination syndromes.



SOLDIER BEETLE ON BUTTERCUP

BEETLES

Beetles have smooth bodies and chewing mouthparts; some are large. Bright, open, disk-shaped flowers with abundant pollen are attractive to beetles and many other insects. California buttercups (*Ranunculus californicus*) and California poppy (*Eschscholzia californica*) are good examples. These flowers and their visitors are relatively unspecialized and may represent the simplest and most ancient kind of syndrome. Some beetles are more specialized. Tiny **sap beetles** (family Nitidulidae) burrow into the flowers of our spice bush (*Calycanthus occidentalis*), attracted by its vinegary scent. **Weevils** (family Curculionidae and relatives) have long snouts; some have been shown to be important pollinators outside California.



BEE FLY ON VERVAIN

FLIES

Flies generally have protruding mouthparts. Some primitive flies feed on the blood of animals, but many also feed on nectar. The musty scent and brown and white colors of fetid adder's tongue (*Scoliopus bigeglovii*) are signals easily perceived on dark forest floors and attract **fungus gnats** (families Sciaridae and Mycetophilidae).

Two other groups of flies likely to be seen on flowers are the **hover flies** (family Syrphidae) and the **bee flies** (family Bombyliidae). The hover flies have relatively short, sponging mouthparts that can take up both pollen and nectar; they are often seen at open flowers. Bee flies have long beaks specialized for drinking concealed nectar from tubular flowers; they also often have fuzzy bodies that can transport pollen. Both hover flies and bee flies can hover. Both generally see yellow, blue and white and come to flowers of these colors.



SWEAT BEE IN VENUS THISTLE

BEES, WASPS AND ANTS

Bees have mandibles capable of chewing pollen, but they also have tongues for drinking nectar. Bees can see yellow, blue and ultraviolet and are attracted to flowers of these colors. Bees also like flowers with a place to land because they cannot hover. Bees are generally fuzzier than wasps, with branched hairs on their bodies. Many have patches or clusters of hairs in specific places that help them carry pollen.



HONEY BEE

Small **sweat bees** (family Halictidae) may be some of the most common bees on flowers, but because of their size, they are often overlooked. Although some may show varying degrees of sociality, those that are solitary, like most of our native California bees, may be active for only a few weeks of the year, spending the rest of the time in hibernation and estivation. The adults may thus be restricted to flowers that bloom at their time of activity. Sweat bees of the genus *Agospostemon* have short tongues and tend to be generalist flower visitors.



BUMBLEBEE ON POPPY



LONGHORNED BEE



NORTHERN WHITE SKIPPER



SPHINX MOTH



ANNA'S HUMMINGBIRD

Carder or cotton bees (*Anthidium* species), like other bees of the family Megachilidae, carry pollen among hairs on the undersides of their bodies. They have long tongues. Most species seem to be generalists, but some seem to favor long-tubed flowers.

The family Apidae as it is now recognized includes many species of bees. They all carry pollen on their legs. The best-known is the **honey bee** (*Apis mellifera*), which was introduced from the Old World. It is attracted to many kinds of flowers, but it may have some preference for flowers of plants introduced from its homeland, such as brooms of the genus *Cytisus*.

Bumblebees (*Bombus* spp.) are also in this family. They are our most familiar fully social bees. Different species of bumblebees have tongues of different lengths, and those with shorter tongues may not be able to access resources in deeper flowers. Bumblebee workers must have access to flowers for all the months of the year that their colonies are active. They thus often feed on a series of flowers with slightly overlapping blooming seasons, making them “temporal specialists.” Lupine, lotus, and other plants of the pea family (Fabaceae) have flowers that attract many bumblebees, and these big bees are able to force open the two sides of the flowers to get to the rewards inside.

Other large bees in the same family that are often mistaken for bumblebees are **dainty-footed bees** (*Habropoda*), which include both generalist and specialist species, and **longhorned bees** (*Melissodes*), which seem to specialize on flowers of the daisy family (Asteraceae).

Wasps and ants are usually smoother and lack tongues. Yet some are important pollinators. These include the famous **fig wasps** (family Agaonidae) and some **ants** (family Formicidae) that visit low-growing plants.

MOTHS AND BUTTERFLIES

Moths and **butterflies** both have long tongues and are good at hovering, but for the most part, moths are active at night while butterflies fly by day. Thus, butterflies are attracted to tubular flowers that are red, pink or violet, the colors their eyes can see in daylight. At night, white flowers are better seen by a moth's eyes, and those emitting strong perfumes are better sensed by their feathery antennae. Although primitive moths such as the famous yucca moths (*Tegeticula*) collect pollen, adults of most of our common butterflies and moths do not. Thus they often prefer clusters of flat-topped flowers that produce abundant nectar and provide a place to land.

MAMMALS AND BIRDS

Vertebrate animals evolved long after the insects. They probably adapted to flowers that were already visited by different groups of insects, later specializing on some of them. Flowers now visited by **hummingbirds** are probably descendants of flowers originally visited by bees and flies. Likewise, flowers now visited by **bats** are probably descendants of those visited by moths.

Compiled by Paul da Silva for Marin CNPS, August 2025. Photos by Paul da Silva and Marc Kummel; sphinx moth by Andreas Schoellhorn