



Color In the Garden

by Carol Barany

For the last two weeks, every morning at dawn, I take my cup of coffee and head to the garden to harvest 'Lauren's Grape' (*Papaver somniferum*) poppies. Yesterday, I stopped counting after I cut 200 stems. These poppies just might be my favorite flower. Maybe I love them so much because their season is so short. A cool season annual, their

splendid display will end as soon as the hot weather arrives.

Embellishing the table where my book group would gather for dinner and discussion that night, the rich Welch's Grape Jelly color of those gossamer petals was savored as much as the wine and asparagus tart.

Flowers captivate and inspire us. And any gardener will tell you that flower color just might be the biggest influencer in what flowers they choose to grow. Hot pinks, sunny golds and oranges, deep purples and blues, or white and cool pastels; we all have our preferences.

Yet pleasing gardeners with their colors has never been the reason for a flower. Flower color is a matter of evolutionary survival. At least 85% of 300,000 species of flowering plants rely on insects, birds, or bats to reproduce. Many of these pollinators seek out flowers partly by recognizing their colors.

It's all part of the plan. Unlike animals, plants can't move from place to place to reproduce. Over millions of years, the angiosperms adapted to survive by producing flowers with colors and scents to attract the specific pollinators they needed. Think of flowers as airport landing lights for pollinators, and nectar and pollen as the rewards for flying in to take a closer look.

Beetle-pollinated flowers typically have a dull color but a strong odor.

Bee-pollinated flowers are usually blue or yellow. They often have distinctive patterns that bees can recognize. These include “honey guides”, special markings that indicate the location of the nectar, and other distinctive markings that are normally invisible to the human eye.

Flowers pollinated by moths and butterflies often have a long corolla tube.

Bird-pollinated flowers produce large amounts of nectar and are often red and odorless because the sense of smell is poorly developed in birds. This explains why the nectar portals on hummingbird feeders are always red.

Bat-pollinated flowers produce copious nectar and have dull colors and strong odors.

Wind-pollinated flowers produce no nectar, have dull colors, and are relatively odorless.

Genes in a plant’s DNA direct cells to produce colorful pigments. Red-petaled flowers have a pigment that absorbs all colors of the spectrum except red. When you look at a red rose, it reflects red light, so it appears to be red.

A flower’s color is usually most intense when the blossom is fresh and the pollen is ready for release. Pigment molecules have a short lifespan and begin to break down after fertilization occurs. Every gardener has observed how



flower color fades as the blossom ages. The color change sends a message to pollinators that their services are no longer needed, since flower’s mission has been accomplished.

The pigments most responsible for flower color are the flavonoids, from which anthocyanins and anthoxanthins are derived. Flower colors in the indigo to red range,

such as blue delphiniums and red geraniums, are formed from anthocyanins. Yellow and some white flowers get their color from anthoxanthins.

Flavonoids aren't found solely in flower tissues. These pigments contribute to the color changes we look forward to in autumn. Chlorophyll, the pigment responsible for the green color in leaves, is dominant and masks the colors of other pigments that may be present in the leaf during the growing season. When night length increases, chlorophyll production slows down and then stops. The carotenoids and anthocyanins in the leaf are then unmasked and can display their colors.

The carotenoids are pigments that produce the rich, vibrant yellow and oranges of sunflowers and California poppies..

Other floral pigments include tannins, which give rise to browns and blacks, betalains, and chlorophyll. Betalains are found in a limited number of plant families, primarily the cacti and related species, and produce a range of colors. Chlorophyll, the pervasive green pigment in plant foliage can color a flower green as well.

Floral colors are among the most highly saturated colors found in nature, beguiling anyone who passes by. Insects, birds, bats, or gardeners, we're all captivated.

Photos by Carol Barany