Flowers and their friendly visitors

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Garden Tales

Why does Queen Anne's lace (*Daucus carota, wild carrot*) often have a small dark spot in the center of its lacy white flower cluster? A recent scientific study supports the idea that the dark spot mimics a beetle, which serves to attract real beetles that pollinate the flowers. This experiment demonstrated that removing the dark spot resulted in fewer beetles visiting the flowers (Goulson et al, Plant Species Biology, 2009).

Many flowers are visited by insects and other animals which transfer pollen to other flowers of the same species, thereby affecting cross-pollination. Flowers are believed to have co-evolved with their pollinators, offering rewards such as nectar and pollen, and having colors, scents and shapes adapted to specific pollinators. Some flowers are generalists and are pollinated by a variety of insects, while others are more specialized. Listed below are examples of different classical pollination syndromes.

Beetle pollination is thought to be a generally unspecialized "primitive" form called "mess and soil," in which beetles walk around and eat parts of the flowers, but at the same time also transfer pollen between the flowers. Beetle-pollinated flowers are typically large, dish-shaped, light in color and scented. Magnolia is an example of a beetle-pollinated flower.

Bees pollinate a great variety of flowers, including important crops like cucumbers and apples. Some bee flowers are colored blue and yellow, and also have ultra-violet "nectar guides" that are invisible to humans. Bee-pollinated flowers like mints, violets and foxglove have a lower lip "landing platform" for the pollinator, and offer pollen and nectar rewards that are hidden within the flower. An unusual and highly specialized form of pollination is found in certain wasps that attempt to mate with orchids that look and smell like female wasps.

Butterflies are typically attracted to showy, colorful (red, lavender, etc.), scented flowers that offer nectar hidden in tubes that the butterflies sip with their long mouthparts.

Birds are also attracted to red and orange, but most don't have a good sense of smell. Ruby-throated hummingbirds pollinate trumpet-creeper vine (*Campsis radicans*), wild columbine (*Aquilegia canadensis*), and cardinal flower (*Lobelia cardinalis*), which are red and have no scent. The hummingbirds get nectar from tube-shaped flower structures while hovering.

Moth-pollinated flowers, such as evening-primrose (Oenothera biennis), are generally white or light-colored, and scented, so they can be found by the moths, which are active in the evening and night.

Bats also are nocturnal, and bat-flowers are also light-colored and scented, and large and strong enough to be grasped by

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Submitted photo/**Michael Maciarello**
The black spot in the center of Queen Anne's lace (*Daucus carota*) may serve to attract insect pollinators.

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bats.

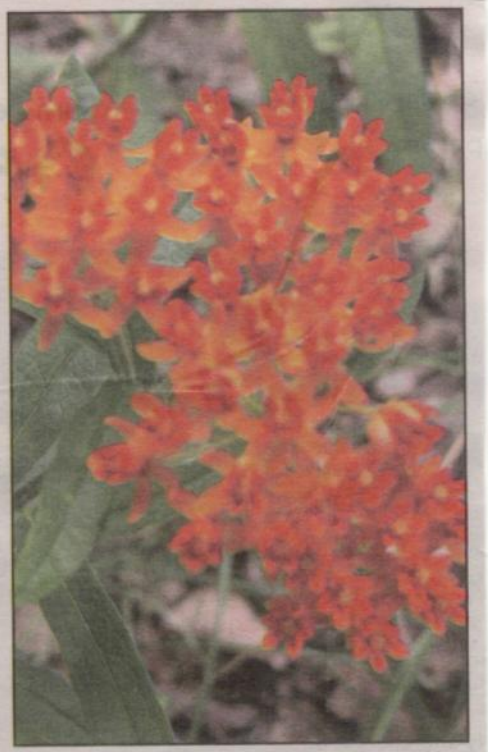
Surprisingly, some flowers smell like rotting meat or dung, and are pollinated by flies. These flowers, such as skunk-cabbage (*Symplocarpus foetidus*), "stinking Benjamin" (*Trillium erectum*), and pawpaw (*Asimina sp.*), are also typically colored reddish-brown, like meat.

Even rodents can be pollinators. The green, nectar-producing tropical flower *Blakea chlorantha* is pollinated at night by a rat!

In contrast to animal-pollinated flowers, the flowers of wind-pollinated plants like ragweed, grasses and oaks are tiny and not colorful. It is mainly such wind-dispersed pollen that causes allergies like hay fever.

Without pollinators, most plants wouldn't be able to produce fruits and seeds!

On the campus of Delaware State University, the Claude E. Phillips Herbarium is Delaware's center for research, education, and outreach about plant identifications, locations, and uses. Call 857-6452 (Dr. Susan Yost, Herbarium Educator) to arrange a tour of the herbarium, or for more information about this article.



Submitted photo/**Susan Yost**
Butterfly-weed (*Asclepias tuberosa*) is well-named, as its colorful flowers and nectar attract butterflies which pollinate the flowers.