The Lusty Spring Wildflowers

by

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> The month of May was come, when every lusty heart beginneth to blossom, and to bring forth fruit; for like as herbs and trees bring forth fruit and flourish in May, in likewise every lusty heart that is in any manner a lover, springeth and flourisheth in lusty deeds. For it giveth unto all lovers courage, that lusty month of May.
> Sir Thomas Malory (*Le Morte d'Arthur;* 1485)

The lusty month of May will soon be here and just as "a young man's fancy lightly turns to thoughts of love" (Lord Alfred Tennyson, *Locksley Hall*), so too will the wildflowers in the Arboretum. Though love may be "beginneth to blossom," springtime in Minnesota is a challenging time of the year for botanical romance. The unpredictable, often cold weather, coupled to the limited availability of pollinators and the small number of days during which it's warm enough for them to fly, means that spring wildflowers require more than a box of chocolates or a romantic dinner date to ensure a successful mating season.

First, spring wildflowers can't afford to be choosy when confronted by limited pollinators and cold weather. Most wildflowers are visited and successfully pollinated by a variety of small insects particularly solitary bees and flies. Some species, like false rue-anemone (*Isopyrum biternatum*) and spring beauty (*Claytonia virginica*), are visited by 20 or more pollinators. On a single feeding run a pollinator may visit as many as four different species of wildflowers. In contrast, only about 10% of the spring wildflowers, such as Dutchman's breeches (*Dicentra cucullaria*), are specialists. Their flowers are visited and pollinated by a single kind of insect which is often a queen bumblebee. The wildflowers that rely on a single pollinator typically form extensive colonies. Since many individuals occupy a site, once a pollinator locates the patch it will more likely visit other individuals of the same species.

As a consequence of sharing suitors, the flowers of spring wildflowers share many characteristics. Most have flat, bowl-shaped flowers that allow easy access by an assortment of pollinators. In contrast, Dutchman's breeches which has a specialized pollinator, has similarly specialized flowers that can only be forced open by a bumblebee. Further, most spring wildflowers have white flowers. The reason for this trend is not completely clear. One likely explanation is that the white color gives the flowers higher visibility against the forest floor so that they can be more quickly located by a foraging pollinator. This is perhaps the botanical equivalent of a neon sign in a red-light district. The flowers of many spring-flowering species also produce pigments that can only be seen under ultraviolet light. Though hidden to our eye, bees readily detect the striking contrast between the dark-colored, UV-absorbing pigments usually in the center of the flower and the lighter-colored, non-UV absorbing areas that surround it. This bulls-eye pattern provides additional floral advertising. The convergence of floral features (*e.g.,* color, shape, UV-pigment distribution) among the spring wildflowers suggests that conformity works well when you're trying to attract a limited number of mates, who have the same preferences, with limited time to forage.

Many spring wildflowers offer a reward to their pollinator. Trout-lily (*Erythronium albidum*), toothwort (*Dentaria laciniata*), and bellwort (*Uvularia* sp.) are among the species that produce nectar to entice pollinators to their flowers. This reward pays off because they receive more visitors than those species like hepatica (*Hepatica americana*), bloodroot (*Sanguinaria canadensis*) and rue-anemone (*Anemonella thalictroides*), that don't produce nectar. The fact that the latter species look similar to nectar-producing ones is often cited as an example of mimicry and a means by which these clever, non-nectar producing species trick pollinators into visiting them without the burden of making nectar. As any mom will tell you, it pays to choose your friends wisely.

Another floral adaptation to limited pollinators is self-compatibility. Many spring wildflowers are self-fertile which means that they don't require pollen from a different individual to produce viable seeds. The drawback of self-pollination is the loss of genetic diversity. Considering that pollination is such an especially risky endeavor at this time of year, self-compatibility is an excellent fail-safe strategy to guarantee seed production in the absence of a pollinator. Bloodroot which is one our earliest spring-flowering species and the one least likely to find a pollinator, produces virtually all of its seed by self-pollination. Not surprisingly, this strategy is also used by alpine and other plants that live in similarly harsh environments.

On a spring walk through the Arboretum you will find a diversity of wildflowers. Though these beautiful plants may look sweet and innocent, as we've seen they employ a variety of "lusty deeds" to "bring forth fruit and flourish in May."