

The Outside Story



Gentians Provide Fall Color – and Bumblebee Food By: Meghan McCarthy McPhaul

The deep purple caught my eye, an unexpected color amid the autumn-hued palette of gold, red, and orange. I stooped to look more closely, thinking perhaps someone had dropped some manmade thing on this grassy, well-traveled path along a hardwood stand. But, no, it was a flower, its summery-colored petals closed up tightly, like a new tulip bud in springtime.

The five purple flowers I saw rising from a whirl of pointed leaves were likely *Gentiana clausa*,

one of three species of the genus *Gentiana* growing in New Hampshire and Vermont. Along with the very similar species *Gentiana andrewsii*, which is less common in our area, *G. clausa* is known commonly as a closed gentian or a bottle gentian. These names refer to the constricted formation of the flower's corolla; unlike the petals of a spring tulip bud, which will spread apart during warm days to reveal the flower's pollen, the petals of these fall-blooming flowers remain tightly closed.

This configuration poses a challenge to pollinators, since the nectar and pollen are not easily accessible. During a time of year when other blooms have largely passed, however, bumblebees seem willing to put in the work required to breach gentian flowers and access the goodness within.

"These plants are pollinated almost exclusively by large bees, which are strong enough to push their way through the somewhat closed opening of the flower," said Arthur Haines, senior research biologist for the Native Plant Trust. "The bees must climb inside and work their way around, getting covered with pollen in the process."

In his book "Swamp and Bog: Trees, Shrubs, and Wildflowers of Eastern Freshwater Wetlands," wildlife biologist John Eastman pointed out that many flowers that attract bumblebees are a similar hue as closed gentians – which range from deep violet to blue-purple – and that these pollinators are well-suited for gaining entry to the closed flowers, which are rich in nectar.

"Tubular gentian flowers...are especially adapted for bumblebee pollination," he wrote. "This

powerfully built insect can shoulder its way past the entrance obstacles that discourage smaller, less efficient pollinators... The bee pries head-foremost into the flower, then backs out, combing the pollen from head and thorax into the baskets on its hind legs.”

Sometimes, however, bumblebees and other insects bypass this effort by creating a hole in the base of the flower to access the nectar and pollen. Haines suggests the timing of gentian blooms is likely related to supply-and-demand. By blooming after many other wildflowers have already faded, gentians are one of the few options for bumblebees during the fall.

“This late season may allow gentians to avoid competition with other flowering plants,” he said. “These pollinator-plant relationships have co-evolved for a long time.”

Eastman noted that gentian species rarely “grow in great abundance anywhere.” Both *G. clausa* and *G. andrewsii* prefer moist, rich soils and areas such as fields and meadows, along roadsides, and open areas of forests, where sunlight can reach the plants. The third *Gentiana* species in our region, narrow-leaved gentian (*G. linearis*) generally grows in bogs, fens, and floodplains, as well as in fields and meadows and along the shores of lakes and rivers. The Northeast is also home to *G. rubicaulis*, the red-stemmed gentian, which in our region grows only in certain areas of Maine.

While the pollen and nectar of closed gentian flowers attract persistent bumblebees, the plants have little value to other wildlife. The

seeds are too small for birds to bother with – and are dispersed by simple gravity when the seed pods split open and release them. The plants’ roots and leaves are bitter, so most animals don’t eat them. One exception is white-tailed deer, which may nibble the tops of young, tender gentian plants before they flower. In response to this browsing, gentians may sprout side branches that grow and eventually produce flowers.

Whether those flowers grow atop the original stem or from deer-inspired side branches, they add a startling – and lovely – pop of purple-blue to autumn’s palette.

Meghan McCarthy McPhaul is assistant editor for Northern Woodlands. The illustration for this column is by Adelaide Murphy Tyrol. The Outside Story is assigned and edited by Northern Woodlands magazine and sponsored by the Wellborn Ecology Fund of the New Hampshire Charitable Foundation: www.nhcf.org.

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