The Outside Story

Turtlehead Tests Bumblebees' Mettle

By Colby Galliher

Among the blooming perennials of late summer is one that guards its secrets closely. The lockbox blossoms of white turtlehead (*Chelone glabra*), a native plant in the plantain family, are an ideal match for the powerhouses of the pollinator world: *Bombus* (bumblebee) species. Turtlehead is found along waterways and other wet areas.

As the plant's name suggests, turtlehead's flowers resemble the crania of their namesake critter. This resemblance is so strong that the genus name, *Chelone*, comes from the Greek for "tortoise." The oblong flowers, white and lavender-tinged and roughly the size of a thumb, grow in clusters atop stems that can measure up to four feet tall.

The flowers' structure makes turtlehead a bumblebee specialty. Their reproductive organs lie within a restrictive clasp of petals that must be pried open for access to the pollen and nectar inside the flower. Many insects are simply too small to muster the strength to part these petals and venture into the bloom – but some are up to the challenge.

"*Chelone glabra* is an important resource for bumblebees," said Ulrich Lorimer, director of horticulture at the Native Plant Trust. "The shape of the flower, the positioning of the stamens [male reproductive organs] and the pistil [female reproductive organ] make *Bombus* species the most efficient pollinators."

Turtlehead and bumblebees enjoy a symbiotic relationship. The bees benefit from the pollen and nectar turtlehead offers, and the plant relies on the bees to facilitate reproduction. Turtlehead flowers are protandrous, which means that each flower has a separate male and female flowering phase, and the plant is self-compatible, meaning that pollen from the male-phase flowers can pollinate female-phase flowers on the same plant.

When a bumblebee enters a turtlehead flower in its male phase, which comes first, the fine hairs on the bee's body and legs accumulate pollen from that flower's stamens. When the bee, with its stowaway pollen load, buzzes along to other flowers on the same plant, some of which will have advanced to the female phase, the bee moves the plant's reproductive cycle forward.

A 2015 study by Leif Richardson and Rebecca Irwin, published in the *Journal of Pollination Ecology*, indicates that while multiple bumblebee species feed at turtlehead flowers, half-black bumblebee (*Bombus vagans*) workers, thanks to their specific body shape, are best able to squeeze through the flowers' tight architecture to get at the nectar and pollen within.

Other bumblebee and native bee species can gain partial access to turtlehead's floral interiors but cannot crawl in deeply enough to feast on the blossoms' full buffet, which also prevents them from pollinating the plant. Still others, shut out from the flowers' innards, chew their way in from the outside and siphon the nectar with their long tongues, a behavior known as "nectar robbing."

Once a half-black bumblebee worker is inside a flower, it will often "sonicate," latching onto a flower's stamens and vibrating into overdrive. This tactic dislodges more pollen from the flower, boosting the bee's take and the pollen load it will carry to the next flower. The magnified buzzing of this zealous dance is often audible if you listen closely once a bee enters a turtlehead flower.

Turtlehead is vital to more than just bumblebees. The plant is the chief larval host of the Baltimore checkerspot, a striking butterfly that lays its eggs on turtlehead leaves, as well as of at least two species of sawfly. Turtlehead's flat, winged seeds, which form in brown capsules that split open in late fall, are also food for microscopic insects. Opinions on the plant's appeal to deer and other herbivores are mixed, but in my experience, browse isn't much of an issue.

There are no special conservation concerns for turtlehead, which remains common along waterbodies across northern New England. But its pollinator partners are in trouble, which makes the species an attractive, slow-spreading option for gardeners hoping to boost native insect populations. Come late summer, you'll have a front-row seat to a showcase of bumblebee might – and a fascinating example of symbiosis.

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