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Various insects visiting and probably pollinating flowers of New Jersey Tea, *Ceanothus americanus*. 1. A sweat bee, *Lasiglossum* sp. (family Halictidae). 2. A bumblebee, perhaps *Bombus griseocollis* (family Apidae). 3. A longhorn beetle, *Brachyleptura rubrica* or a similar species (family Cerambycidae). 4. A flesh fly (family Sarcophagidae). 5. A hover fly from the genus *Syritta* (family Syrphidae). 6. Another hover fly, *Toxomeris marginatus* (family Syrphidae).

Celebrating NJ Tea's unspecialized pollination

Article by W. John Hayden, Botany Chair

Specialized pollination systems are the source of some of the most compelling stories in natural history. There is something appealing to the human psyche about what seems to be a reciprocal agreement between a given plant and its dedicated pollinator: the plant attracts a pollinator and provides ample nectar and/or pollen as a reward for the pollinator's service in moving pollen from anthers to stigmas while foraging for food. Of course, these organisms have neither signed agreements nor memos of understanding. Instead, it has merely proven to the benefit of the plant, over time, to form certain floral structures, and to produce excess pollen and/or nectar. Likewise, certain behaviors by the pollinators have proven, in the long run, beneficial to the survival of the pollinator. To put it in human terms, each is acting in its own self-interest, but together they are like pieces of a puzzle that fit together perfectly. Thus, for example, Cardinal Flower (*Lobelia cardinalis*, the 1991 VNPS WOY) is bright red, a color highly attractive to hummingbirds, the flower is zygomorphic (bilaterally symmetric), which channelizes the hummingbird's approach to a direct, head-on orientation, from which the anthers are positioned in just the right spot to dust pollen on the face of the hummingbird as it probes deeply into the flower for a

sip of nectar; a second visit to another flower will smear some of that pollen directly onto a perfectly positioned stigma. Mission accomplished!

As intriguing as they are, specialized pollination symbioses are not the only game in town. What might be considered the opposite extreme are highly unspecialized pollination syndromes characterized by individual flowers, or groups of closely spaced flowers, that are easily accessible to a wide variety of visitors. Such plants are often characterized as "pollinator magnets." The 2019 VNPS WOY, *Ceanothus americanus* or New Jersey Tea, provides an instructive case in point. Granted, *Ceanothus* flowers are a bit peculiar (see *Sempervirens* Spring 2019: 6-7). Despite their individual oddities, these small flowers occur in clusters and within a given cluster many flowers are open at the same time. A wide variety of insects can alight on a *Ceanothus* flower cluster, probe multiple flowers for nectar, and while clambering around, pick up pollen on one or another body part. The process is repeated upon visiting another flower, but some pollen from anthers of the first flower cluster will rub off on stigmas of the second. And because many different insects can function as effective pollinators, most *Ceanothus* flowers get pollinated and eventually produce seeds.

The accompanying images constitute a celebration of New Jersey Tea and the diverse insects that visit, and probably pollinate its flowers—actually, shown here are just a small portion of its potential insect visitors. Note that while rigorous scientific data are required to demonstrate that any floral visitor is an actual pollinator, I think it is highly probable that the insects illustrated here are indeed effectively transporting *Ceanothus* pollen between flowers. Tom Houser of the Norfolk Botanical Garden graciously provided these images and Dr. Art Evans provided insect identifications. Their assistance is gratefully acknowledged. ❖



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