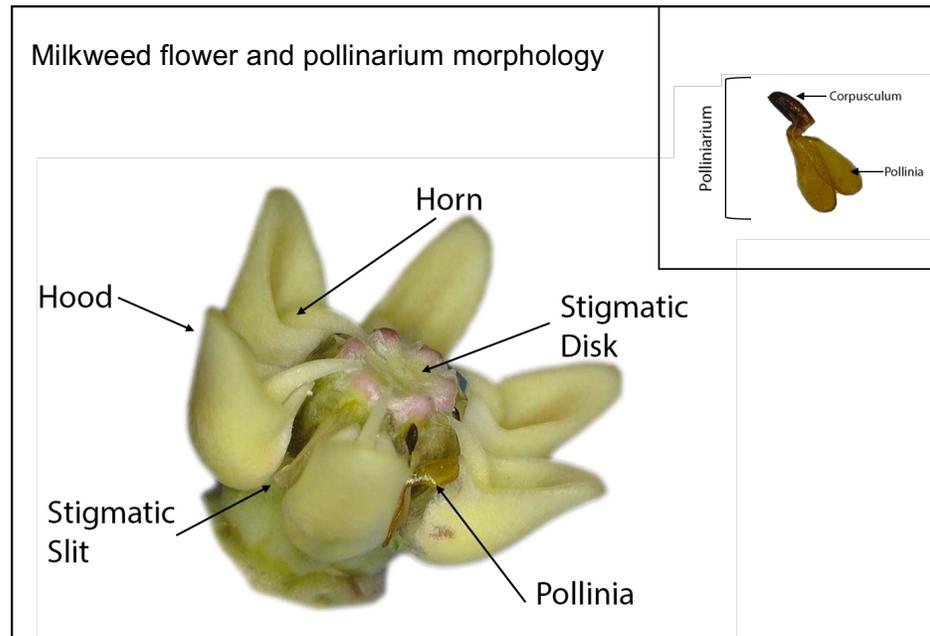


MILKWEED POLLINATORS AT BORDERVIEW FARM

Asclepias syriaca, or common milkweed, is a perennial plant that is native to Canada and the continental United States (USDA Plants database). Milkweed can be found in a multitude of plant communities such as open woods, forest edges, riparian zones, meadows, and prairies (Borders et al. 2013). Common milkweed reproduces via underground shoots and can be propagated from both seedlings and rhizome cuttings. Propagated milkweed typically blooms in its second year (USDA Plants database).

Unlike most insect-visited flowers, milkweed flowers package pollen into pairs of small waxy sacs known as pollinia (Borders et al. 2013). Pollinia are found in stigmatic slits, five vertical grooves along the flower's corona. Both pollinia (pl. pollinaria) are attached to nectar-

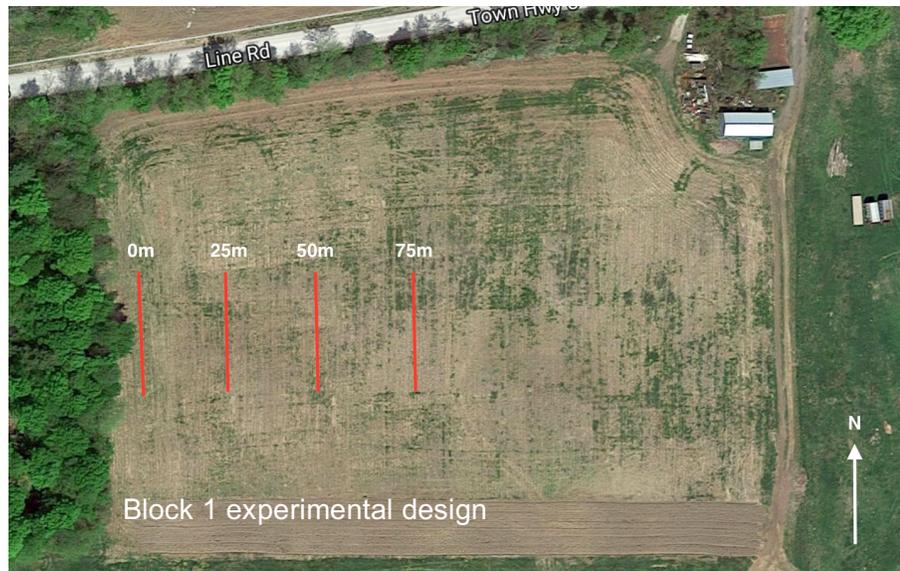


foraging insects when mouthparts or legs slip into the stigmatic slits. Pollinia are then transferred to other flowers as the insect continues to forage. Packaging pollen into pollinia may discourage self-pollination, because pollinia remain adhered to insects over many flower visits thus increasing the likelihood of pollen outcrossing. One study concluded that once a bumble bee received pollinia from a milkweed flower, it was took over 1000 subsequent visits for the pollinia to be inserted into another flower (Morse 1982).

Milkweed is an essential resource to the monarch butterfly. Adult female monarch butterflies lay their eggs on the underside of milkweed leaves. After consuming the plant for up to two weeks, caterpillars form chrysalises and later emerge as adult butterflies. In addition to monarchs, a variety of other insects forage on common milkweed and contribute to pollination. Milkweed flowers are visited by numerous insect orders, and attracts both diurnal and nocturnal pollinators due to its high nectar production (Jennersten and Morse 1991). Some insects observed carrying the pollinia of common milkweed include honey bees (*Apis mellifera*), *Bombus griseocollis*, the

great golden digger wasp (*Sphex ichneumoneus*) and the great black wasp (*Sphex pensylvanicus*) (Struven et al. 1994).

We aimed to study the diversity and abundance of common milkweed pollinators with an focusing bee species present. Our study included both blocks of common milkweed at Borderview Farm. At the time of our study, Block 1 was approaching its third year and Block 2 was



approaching its second year. We caught pollinators seen on milkweed flowers to sample for diversity. We also conducted eight 10-minute observations at 4 distances classes in each block (Fig. 1). We noted the number of individuals and flower visits for different eight morphospecies of pollinators: *Apis*, *Bombus* (queens), *Bombus* (workers), *big black bees*, *slender black bees*, *tiny black bees*, *Lepidoptera*, *wasps*, *flies*, *beetles*. In order to study the effectiveness of bee pollination, we also conducted catches in which we recorded the number and placement of pollinia on individual bees.

RESULTS

- We sampled each block 3 times between 7/3-7/11/2017
- Our collection effort focused on bees. We collected individuals belonging to the genera: *Apis*, *Andrena*, *Augochlora*, *Augochloropsis*, *Bombus* and *Osmia*
- We observed bees, butterflies, beetles, flies, and lacewings visiting milkweed flowers
- Although different bee species were present at Borderview farm, *Apis mellifera* (honeybees) were the dominant species and made >95% of observed visits
- We found few bees other than honey bees with attached pollinaria. On average honeybees had 2.25 pollinaria attached
- In terms of point of attachment, pollinaria were more often found on the front legs of honeybees (Fig. 1)

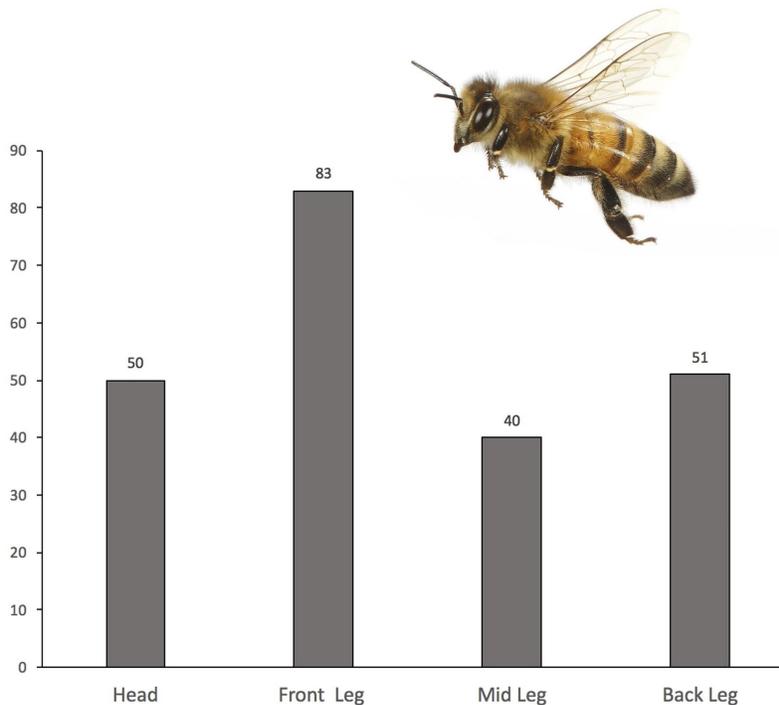


Figure 1 Number and placement of milkweed pollinaria on *Apis*

REFERENCES

- Borders, Brianna, Allan Casey, John M. Row, Rich Wynia, Randy King, Alayna Jacobs, Chip Taylor and Eric Mader. "Native Milkweeds." (2013): 3-4. Xerces Society for Invertebrate Conservation.
- Jennersten, O., & Morse, D. H. (1991). The quality of pollination by diurnal and nocturnal insects visiting common milkweed, *Asclepias syriaca*. *American Midland Naturalist*, 18-28.
- Morse, D. H. (1982). The turnover of milkweed pollinia on bumble bees, and implications for outcrossing. *Oecologia*, 53(2), 187-196.
- Struven, R. D., James E. Wall, and Francis B. Heitler. "Insect pollinators of 12 milkweed (*Asclepias*) species." *Proceedings of the thirteenth North American Prairie Conference. Department of Parks and Recreation, Windsor, Ontario, Canada. 1994.*
- USDA Plants*. United States Department of Agriculture & Natural Resource Conservation Service.