# Effects of Invasive Aphids on Common Milkweed Ecology

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## Background

*Common milkweed*

Common milkweed (*Asclepias syriaca*) is frequently found on roadsides and open fields, but much of their habitat is being lost to human development. The invasive oleander aphid (*Aphis nerii*) targets milkweed species and can potentially weaken these plants. This may have downstream effects on other insects relying on milkweed, including the declining monarch butterfly (*Danaus plexippus*), which uses milkweed as a host plant. We surveyed milkweed populations to determine overall prevalence of the invasive aphid and identify possible effects of the aphids on milkweed and monarchs.

## Key questions

Is the abundance of aphids, monarchs, or other invertebrate taxa related to milkweed patch size?

Do oleander aphids affect the growth of milkweed or the presence of monarch caterpillars?

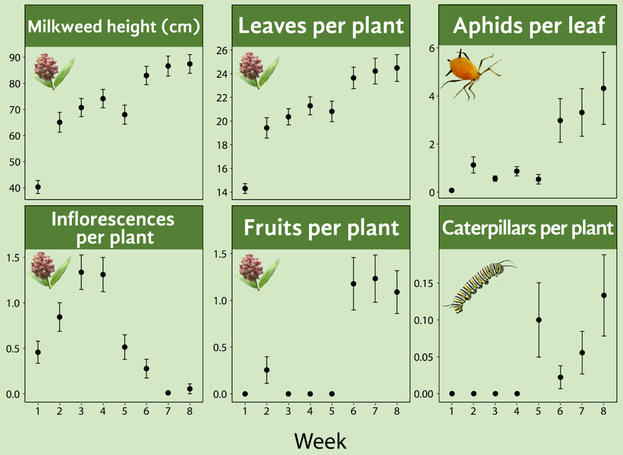
## Methods

*Counting oleander aphids on milkweed*

In Fall 2018, we conducted an initial survey of *Danaus plexippus* and *Aphis nerii* abundance in 23 populations of *Asclepias syriaca* in northeastern Pennsylvania, USA.

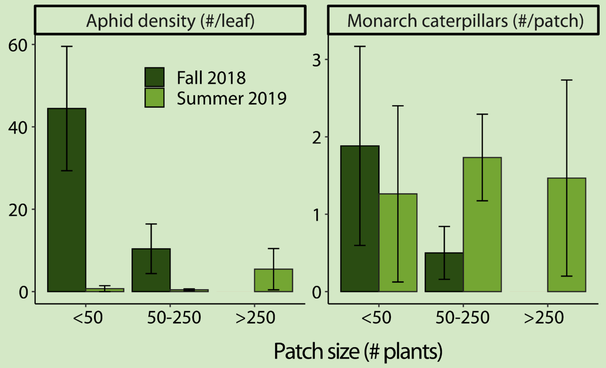
In Summer 2019, we conducted regular monitoring of milkweed plants and associated insects in nine *A. syriaca* patches in northeastern Pennsylvania. In each patch, ten plants were tagged and measured weekly for height and number of leaves. Density of aphids was recorded on leaves and fruits, as well as abundance of monarch caterpillars. We also recorded the presence of other invertebrate taxa.

## Results

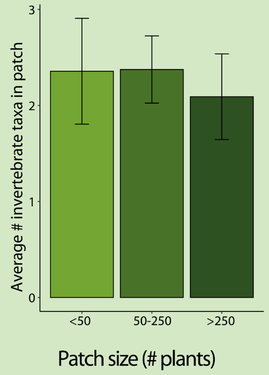



*Milkweed growth, aphid abundance, and monarch caterpillar abundance across the sampling period.*

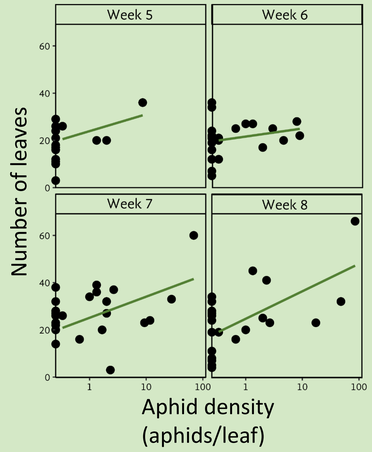
Aphids and caterpillars became abundant at roughly the same time, after the peak milkweed flowering period.




In fall, aphids and monarchs were more abundant in smaller patches. There was no clear relationship between patch size and aphid or monarch abundance in summer.

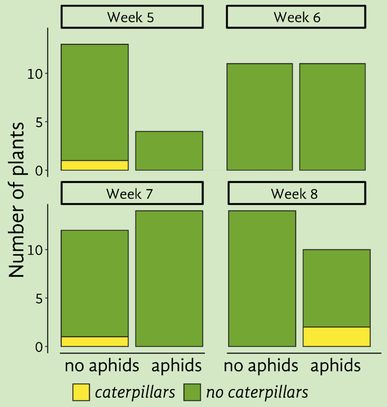



Invertebrate species richness did not differ significantly among milkweed patch sizes.




Aphid density was positively related to number of leaves on a plant (controlled by week, $p<0.001$).

Monarch caterpillars were rare, and their abundance was not related to aphid presence.




## Conclusions

*High aphid density on a milkweed stem*

Milkweed population size did not have a clear relationship with aphid abundance, monarch abundance, or overall richness of invertebrate taxa on the plants.

Aphid density was positively related with the number of leaves on a plant, but did not appear strongly related to plant height or fruit production (not pictured).

*Measuring milkweed at Cherry Valley Wildlife Refuge*

Aphid density did not appear to influence likelihood of monarch presence.

These results suggest that aphids may not have strong effects on milkweed growth or downstream effects on the availability of milkweed as a host for monarchs, but they may be attracted to (or reproduce more quickly on) plants with more leaves.

## Acknowledgments

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