



Native Plant Society of Northeastern Ohio
Holden Arboretum
Garlic Mustard Workshop
22 April 2023

Garlic Mustard Work Shop, April 22, 2023

By Judy Barnhart

After a rainy drive to Holden, A small intimate group enjoyed Holden Forests and Gardens Natural Areas Biologist Rebecah Troutman's presentation in the education center on the newly discovered aphid enemy of the invasive garlic mustard at Holden's Working Woods, where forest research is on-going. Becah's enthusiasm for her topic made the power point presentation enjoyable and easy to understand. Both garlic mustard *Alliaria petiolata* and the garlic mustard aphid *Lipaphis alliariae* are native to Europe and Asia.

As many know, Garlic Mustard is impacting our native forests by reducing the growth of spring wildflowers. By producing numerous seeds which remain viable for up to ten years, they are transported by both humans and water. As a biennial, the first-year rosettes with kidney-shaped leaves are interspersed with emerging wildflowers, the following year the stem elongates with triangular shaped leaves and small white 4-petalled flowers typical of members of the mustard family, followed by 2-3" seed pods.



An authentic-looking construction paper model Becah made of the garlic mustard plant complete with leaves, flowers, seed pods and aphids graced the table for reference.

Discovered in 2021 while pulling garlic mustard, a daily occurrence for Becah in Holden's natural areas, she noticed some leaves were wrinkled or puckered and the seed pods twisted. After careful examination she noticed "bugs" on the leaves. Not an entomologist, she sent them off to Doris Lagos Kutz (USDA-ARS) who confirmed they were garlic mustard aphids, the first location in the United States. Becah shared the aphid's life cycle from egg to 5 instars then adult. Unusual in most insect species a wingless adult can give live birth. Winged adults fly off to new locations to spread the pest around. The turnip aphid is

also found on garlic mustard. It is lighter olive green while the GM aphid is dark blueish/green. Both species have tail pipes and a cauda. However, the cauda shape of the turnip aphid is skinner and spoon shaped while the garlic mustard aphid is wider and pointed.

To find out more about the relationship between the aphid and garlic mustard, the Research department studied the plants: They pulled the leaves off both infested plants and unaffected control plants scanned them to compare specific leaf area and leaf mass- which was found to not differ statistically. They also took measurements of height, weight, and counted seed pods (siliques). Plants with aphids were shorter, weighed less and had fewer seed pods. This year they will be planting seeds from affected plants in a lab setting to see if the seeds in the twisted pods are viable.

Some people believe the wrinkled leaf may be from a virus that is transferred by the aphid, which is the next research step. Stay tuned.

Given the importance of controlling garlic mustard, Holden is trying to better understand the impact this species has on garlic mustard. Could it be a desperately needed biocontrol agent? The objective is to quantify the impact of this novel aphid on garlic mustard and map its current distribution.

Holden is looking for people to help with the distribution of the garlic mustard aphid. They have set up an EDDMaps mapping survey form that is easy to follow. Contact Becah if you'd like to help with research at rtroutman@holdenfg.org.

The rain had stopped for our hike into the woods to look to see if we could find any aphids. A few 1st year rosettes were found, but no aphids could be found. Instead, we enjoyed the diversity of spring wildflowers, including a huge patch of Great White trillium protected from deer inside a grape vine tangle. Upon returning to the building, Becah had preserved specimens we could look at under the microscope.

We thank Becah for taking time out of her busy day to share this new-found research project.

Judy Barnhart

Garlic Mustard Aphid Photos: by Rebecah Troutman



Photograph by Rebecah Troutman



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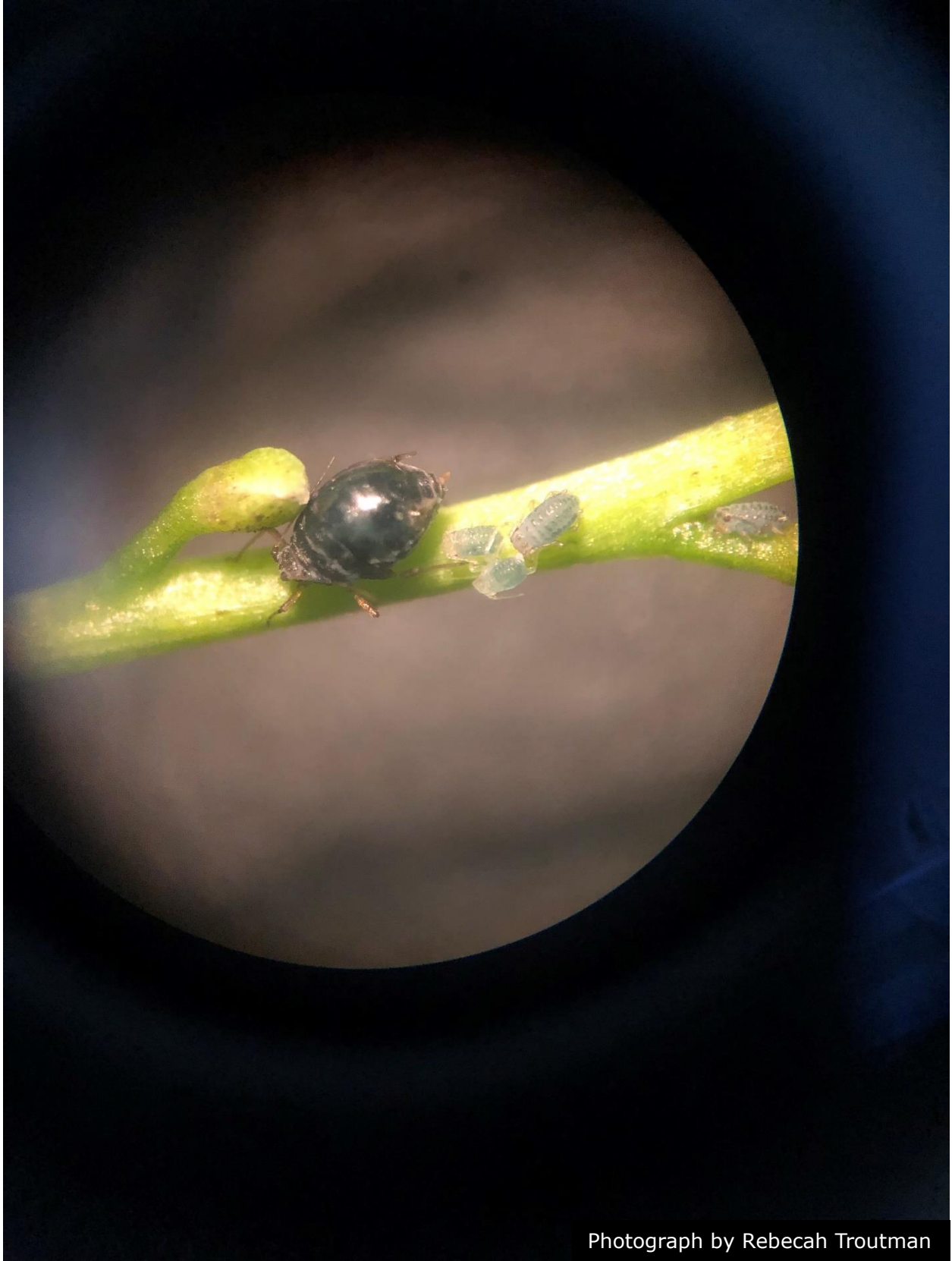
Photograph by Rebecah Troutman



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