

**The New England Botanical Club  
Graduate Student Research Awards  
2019 AWARD WINNER**

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**The potential impacts of increased warming and nitrogen on *Alliaria petiolata* (garlic mustard) physiology across a latitudinal gradient**

*Alliaria petiolata* (Bieb.) Cavara & Grande (garlic mustard), is an invasive forb that has drastically altered the composition of native plant and soil communities in New England and the eastern United States. The mechanisms behind the ecological success of *A. petiolata* are a combination of widespread seed and the production of phytochemicals. These secondary compounds inhibit mycorrhizae beneficial to numerous local species. Extensive research has been conducted on the loss and potential recovery of such important native plant-fungal symbioses. However, the increasing effects of climate change within this region warrant further investigation into the physiological responses of *A. petiolata* to these novel environmental conditions. Additionally, exploring ecotypic variation of *A. petiolata* plants from different latitudes may inform predictions regarding global change effects on potential geographic range shifts in this species. Seeds from three different states (MA, VT, and PA), which represent a distinct temperature gradient within *A. petiolata*'s range, will be grown in common garden conditions. Physiological, growth, and environmental measurements will be taken on plants subjected to four randomized factorial global change parameter treatments including soil warming, nitrogen, combined soil warming + nitrogen, and a control. Comparisons will be made to *in situ* plants ultimately addressing the following questions: 1) Does the combination of increased soil temperature and available nitrogen influence *A. petiolata* productivity? and 2) Is there phenotypic variation associated with the physiology of latitudinal *A. petiolata* ecotypes?

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The New England Botanical Club offers each year up to \$6,000 total in support of botanical research to be conducted by graduate students. The awards are made to stimulate and encourage botanical research on the New England flora, and to make possible visits to the New England region by those who would not otherwise be able to do so. It is anticipated that two to three awards will be given, although the actual number and amount of awards will depend on the proposals received. The awards are given to the graduate student(s) submitting the best research proposal dealing with systematic botany, biosystematics, plant ecology, or plant conservation biology.