

ABSTRACT OF THE THESIS  
Life History Variation  
of Alliaria petiolata in  
a Range of Habitats in New Jersey  
by Diane Linda Byers M.S.

Thesis Director: Professor James A. Quinn

Alliaria petiolata, an obligate biennial of moist woods, has recently expanded its range of habitats which differ in the light and water available to the plants. Survivorship, flowering phenology, biomass allocation, seed quality, and other reproductive characteristics may be affected by colonization of these drier, and more open, habitats. Variation in survivorship and reproductive ability of a species in a range of habitats may arise from genotypic differences, environmental effects, or a combination of the two. To examine if reproductive characteristics are affected by the drier habitats four populations of A. petiolata were studied. Results of two generations showed that A. petiolata had lower survivorship in the drier habitats. Flowering was later and seed quality, as determined by weight and germination, was lower in these habitats. Plants in drier and earlier successional habitats allocated a greater proportion of biomass to reproduction than plants in the floodplain habitat. To examine if the

observed population differences were due to genetic variation or to environmental modification, a reciprocal transplant experiment utilizing the two most different populations was established. This experiment showed that it depended on the particular character being examined as to whether the plants exhibited a plastic response to the environment or whether genetic differences appeared to exist. The results of this study indicate that the increase of habitat range of A. petiolata appears to be at a reproductive cost.