

GARLIC MUSTARD: AN UNREMARKABLE ENGLISH WILDFLOWER CONQUERING AMERICA. Steven G. Hallett, Associate Professor, Department of Botany and Plant Pathology, Purdue University, 915 West State Street, West Lafayette, IN 47907.

It has become increasingly apparent that invasive plants can have devastating impacts upon ecosystems, but it is not always clear how their impacts are mediated. For some plants there are intuitive explanations, such as salt cedar (*Tamarisk* spp.) which modifies the hydrology of riparian systems, and cheatgrass (*Bromus tectorum*) which modifies fire regimes. For other plants, however, the process and impacts of invasion are more difficult to explain. In Europe, garlic mustard (*Alliaria petiolata*) is an unremarkable wildflower; common but not weedy. Yet it has invaded North America from the eastern seaboard to the Midwest. The explanation for the garlic mustard invasion seems to lie underground. The relationships among garlic mustard and its associated soil biota in Europe are the result of millennia of coevolution. The relationships among garlic mustard and its associated soil biota in North America are very recent. Thus, the North American soil biota are completely naïve to the biological weapons that garlic mustard has evolved in its perpetual battle against the Europeans. It turns out that garlic mustard has evolved a potent arsenal. Allelochemicals from garlic mustard have only a modest effect on soil microbial communities from Europe, presumably because they have evolved avoidance, tolerance and/or resistance mechanisms. In contrast, the allelochemicals of garlic mustard are devastating to the naïve soil microbial communities of North America. One particularly important group of soil microbes is the arbuscular mycorrhizal fungi (AMF), a group of symbionts from which many plants derive significant nutritional benefit. The negative impact of garlic mustard upon North American AMF may hold the key to understanding the remarkable invasion ecology of this otherwise unremarkable plant.