

Garlic Mustard



Alliaria petiolata (Bieb.) Cavara & Grande

Alternate Names

Sauce-alone, jack-in-the-hedge, poor man's garlic

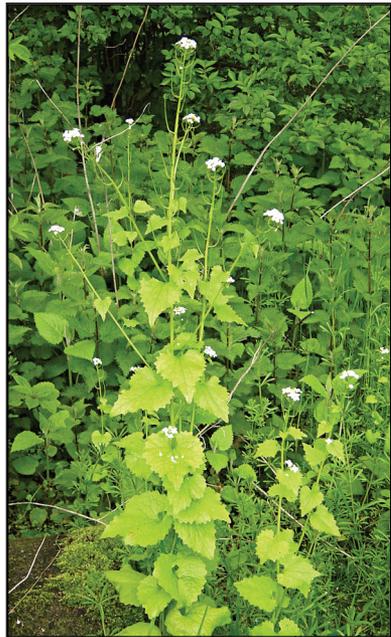
Synonyms

Alliaria alliaria (L.) Britt.,
Alliaria officinalis Andrzej.
 ex. Bieb., *Erysimum*
alliaria L., *Sisymbrium alliaria* (L.) Scop.

Description

Garlic mustard is a taprooted, herbaceous biennial plant with an erect stem that is unbranched below the inflorescence. It can grow to over 3 feet tall but is generally between 12 and 18 inches tall. First year plants are rosettes of dark green, kidney-shaped leaves up to 4 inches in diameter with distinct leaf veins and scalloped edges. Second year plants have basal leaves that are kidney-shaped and slender-stalked; the stem leaves are 2½–4 inches wide, heart-shaped, and alternate and gradually decrease in size. Second year plants have few- to several-branched stems, which are sparsely hairy below. Garlic mustard has short racemes of white, 4-petaled flowers, ½ of an inch in diameter.

Plants flower in April–June with siliques produced in June–August. This species gives off a strong garlic odor when crushed and is tolerant of cool temperatures.



USDA Forest Service photo by Tom Heutte

Similar Species

There are a number of white-flowered mustards in Alaska, but no others have large, well-developed, and toothed stem leaves or are garlic-scented. Large-leaved avens (*Geum macrophyllum* Willd.) is a native species that is commonly mistaken for garlic mustard rosettes. Avens can be distinguished by their highly dissected leaves divided all the way to the petiole base.



USDA Forest Service photo by Tom Henette

Garlic mustard rosette.

Ecological Impact

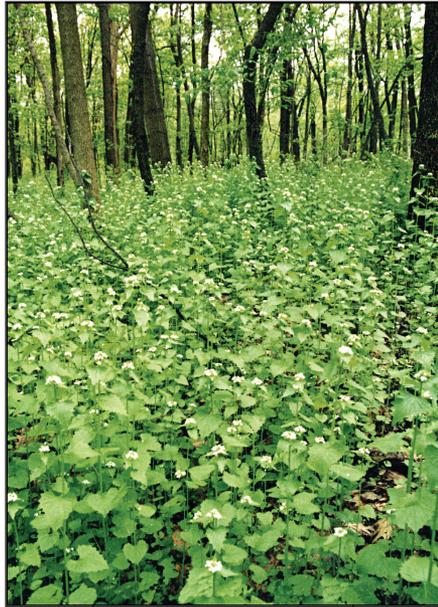
Garlic mustard can dominate the understory of forested areas and out-compete native species for light, moisture, nutrients, and space. It readily spreads into undisturbed forests and species-rich sites in the midwestern and north-eastern United States, where many impacted species are threatened or endangered. Garlic mustard appears to alter habitat suitability for native birds, mammals, and amphibians and may affect populations of these species (Nuzzo 2000). For example, it reduces foraging sites for deer and other large herbivores. Garlic mustard also produces allelopathic chemicals that may interfere with the growth of native species. Garlic mustard is regarded as one of the worst invasive plants in many states because of its ability to colonize natural areas.

Biology and Invasive Potential

Garlic mustard flowers readily self-fertilize in the absence of insect visitation, but can also be cross-pollinated by a variety of insects. Its seeds are shiny-black and cylindrical with 8–10 per pod; an individual plant can produce up to 8,000 seeds. Seeds may remain viable for 4–5 years in the soil (Nuzzo 2000, Byers and Quinn 1998). Continued disturbance promotes greater seed production, which in turn promotes larger populations. In the absence of disturbance, garlic mustard gradually declines to a low,

stable level, although it can rapidly become more abundant with renewed disturbance (Blossey 2003, Nuzzo 2000). It can resprout after removal of the aboveground material (WDNR 2004b). Wind dispersal is limited, and seeds do not float well, although they readily attach to moist surfaces. Garlic mustard may be dispersed by rodents, birds, and deer (Nuzzo 2000). The small seeds are also transported by boots and clothing, as well as by roadside mowing, automobiles, and trains (Rowe and Swearingen 2003).

Garlic mustard is adapted to sand, loam, and clay soil textures, and it frequently grows in well-fertilized sites with pH levels ranging from 5.0 to 7.2. It is successful in many habitat types, however it is usually associated with calcareous soils and does not tolerate high acidity. Garlic mustard prefers moist shaded soils, but can do well in open areas. A cold-stratification period is required for germination. Garlic mustard is listed as a noxious weed in Alabama, Minnesota, Vermont, and Washington and is considered to be “ecologically invasive” in Wisconsin.



Garlic mustard infestation.

Photo by Elizabeth Czarapata, *Invasive Plants of the Upper Midwest*, University of Wisconsin Press.

Distribution and Abundance

Garlic mustard was introduced to the United States for food and medicinal purposes and later escaped from cultivation. Currently, it is distributed from Maine to South Carolina and west through the midwestern states to Washington and Oregon. Garlic mustard is a plant of roadsides, yards and gardens, abandoned fields, river floodplains, forests, forest openings, and wet meadows. As of early 2005, it has only been found in two locations in Alaska, both in Juneau. Garlic mustard is native to Europe and has also been introduced to North Africa, India, and New Zealand.

Management

Hand-pulling, cutting, burning, and herbicide treatments can be successful in controlling or eliminating garlic mustard. During control events, extreme care should be taken to prevent seeds from being moved from the site. Hand-pulling is effective if the entire root is removed through careful pulling; if the upper half of the root remains in the soil, plants will resprout. Hand-pulling is best done in early spring before other plants overgrow a site and make access difficult. Exercise care when using non-selective herbicides that will harm native species. Damage can be reduced by applying herbicides early in the growing season before other plants have sprouted or by using a sponge or wick applicator rather than broadcast spraying. In Southeast Alaska, garlic mustard remains alive and green through the winter, growing immediately after snowmelt. It is essential that an area be monitored for at least 5 years after initial control efforts due to recruitment from the seed bank. Studies are underway to determine effective biological control agents, which may include weevils or flea beetles. If approved by the USDA, these biological control agents may become an option by 2007 (Blossey et al. 2002).

Notes

Juneau residents are fighting an uphill battle (literally) to eradicate garlic mustard from Alaska. There are several infestations near the governor's mansion in Juneau that have been hand-pulled several times a year for the last three years. The plant is edible and was traditionally used in soups and salads.



USDA Forest Service photo by Michael Shephard