

Garlic Mustard *Alliaria petiolata*

About

Garlic mustard (*Alliaria petiolata*) is an edible invasive herb native to Europe. It was introduced to North America in the late 1800s as a food and medicine source but has escaped cultivation and is now present throughout many US states and several Canadian provinces. Garlic mustard is a threat to native understory species as it is able to grow rapidly and change soil chemistry, outcompeting native species and altering the ecosystems it invades.

Distribution

Native to Europe, Garlic mustard was first recorded in North America in the late 1800s and is now present in 30 eastern and midwestern states, as well as Ontario, parts of Quebec, and parts of western and Atlantic Canada. In BC, it is reported from the Okanagan, Lower Mainland and the Victoria area.

Legal Status

BC Weed Control Act, Community Charter — A Provincial Containment species by the BC Inter-Ministry Invasive Species Working Group.

Identification

First Rosettes: Plant is a short rosette (2.5-10 cm off the ground). Root and leaves release garlic scent when crushed, which is strongest when the plants are young. This scent can be an important key for differentiation from similar species.

Second Year: In the spring of the second year, rosettes grow flowering stems.

Flowers: Small white flowers (6 mm diameter) with four petals (6 mm long) appear in early spring.

Stems: Flowering stems are thin and sparsely hairy and in second year reach up to 1.2 m tall.

Leaves: First year leaves are kidney-shaped with scalloped edges. Second year leaves are triangular-shaped with jagged edges and become smaller towards the top of the stem.

Fruits: 2.5-6 cm long seed pods appear in mid-summer with black seeds about 3 mm long.



R. Routledge; Bugwood.org

Biology

Habitat: Able to proliferate in a wide range of soil types (such as clay, loam, and sand), but is relatively intolerant to acidic soils. It occurs in both moist and dry areas but grows best in damp areas. It is found on disturbed (such as roadsides, logged forest, and urban areas) and undisturbed areas, including mature forests. Higher levels of light generally produce larger plants with more seeds.

Reproduction: It is an obligate biennial, meaning that seeds germinate in early spring, then develop into basal rosettes and overwinter in this stage. The following spring, the plant matures and produces flowers, which produce seeds throughout the summer, after which the plant dies. Plants produce up to 150 seed pods, with up to 22 seeds per pod (up to 3300 seeds per plant). Seeds usually drop within 2 m of the parent plant and remain dormant for at least one year before sprouting. Seeds are viable in soil for up to five years.



L. Mehnhoff; Bugwood.org

Dispersal: Spreads naturally via “satellite populations” of one or several plants 6-40 m away from a main infestation, which then expands to fill the space in between. Dispersal is aided by natural disturbance events such as wind and flooding. Deer prefer native understory species to Garlic mustard and aid dispersal by feeding on native competitors while carrying seeds to new locations on their fur. Disturbances by human activities, including logging and construction of roads, fences, and trails, aid in dispersal. Seeds are also carried on clothes, shoes, and pets. Only one plant is required to start a new population.



Impacts

Ecological: Garlic mustard is allelopathic, meaning the plant produces compounds that change soil chemistry, inhibiting understory plants and mycorrhizal fungi species from growing nearby and may reduce young tree growth. These chemicals also deter herbivores from eating the plant, increasing its success. Because seedlings grow early and rapidly in the spring, they often outcompete native species for space. Garlic mustard can become the dominant understory plant in a previously uninvaded forest in 5-7 years, directly competing with spring wildflowers and other native species.

Economic: Being allelopathic, its establishment in forests can inhibit tree growth and change stand dynamics through time. This can have lasting effects on the market value of timber. Garlic mustard can carry diseases that may spread to other garden plants, damaging urban gardens and agricultural crops. Garlic mustard that is consumed by cows results in tainted milk and is unmarketable due to its garlic flavour.

Integrated Pest Management

Prevention: To ensure against accidental spread, always examine clothing, footwear, pets, and equipment for seeds and plant parts after being outdoors or moving from place to place. Brush off footwear and pets thoroughly and spray mud and dirt from equipment and vehicle tires on site.

Mechanical Control: First, focus removal on second-year plant satellite populations (or isolated individuals). It is best to pull before or while the plants are in flower, which will likely occur from May to June, depending on temperature and location. To remove, pull the entire plant, including the S-shaped taproot, to prevent regrowth. Place the pulled plant material in sealed plastic bags and dispose of it in municipal landfills or waste bins. Never compost garlic mustard or other invasive species, as many plants will still go to seed after being pulled.

Biological Control: A search for potential bioagents is ongoing.

Chemical Control: Herbicide recommendations and use must consider site characteristics and be prescribed based on site goals and objectives. Herbicide labels and other sources of information must be reviewed before selecting and applying herbicides.

1-2% glyphosate can provide effective control of Garlic mustard seedlings and rosettes when plants are actively growing. As glyphosate is a non-selective herbicide, it will kill or damage other plants it contacts. Caution must be taken to ensure the herbicide does not come into contact with other plant species, including stems of woody plants. There are currently no available selective herbicides that are registered for use on Garlic mustard.

Residents do not require an applicator certificate for uses of domestic class glyphosate on private land. **Note** – Application of pesticides on Crown land must be carried out following confirmation of use of a Pest Management Plan (*Integrated Pest Management Act*) and under the supervision of a certified pesticide applicator. <https://www2.gov.bc.ca/gov/content/environment/pesticides-pest-management>.

Reporting

Report Garlic mustard by using the mobile Report-Invasives-BC app for Apple and Android platforms, <https://bcinvasives.ca/take-action/report/>.

Report online to the Province or the ISCBC at info@bcinvasives.ca or 1-888-933-3722.

References/Links

Invasive Species Alert Government of BC. https://www2.gov.bc.ca/assets/gov/environment/plants-animals-and-ecosystems/invasive-species/alerts/garlic_mustard_alert.pdf

Garlic Mustard Best Management Practices in Ontario. https://www.ontarioinvasiveplants.ca/wp-content/uploads/2016/07/OIPC_BMP_GarlicMustard.pdf

Invasion pattern of the herb garlic mustard (*Alliaria petiolata*) in high quality forests. <https://link.springer.com/article/10.1023/A:1010009514048>

E-Flora BC: Electronic Atlas of the Flora of British Columbia. <https://linnet.geog.ubc.ca/Atlas/Atlas.aspx?sciname=Alliaria%20petiolata#:~:text=In%20BC%2C%20it%20is%20reported,garlic%20odour%20of%20crushed%20leaves>

BC Ministry of Environment Integrated Pest Management Program 2016. <https://www2.gov.bc.ca/assets/gov/environment/pesticides-and-pest-management/pesticide-use/guidelines/the-rules-have-changed-guide-for-residents.pdf>

Government of BC Pesticides & pest management. <https://www2.gov.bc.ca/gov/content/environment/pesticides-pest-management>

How to Remove Garlic Mustard, Invasive Species Centre. https://www.invasivespeciescentre.ca/invasive-species/meet-the-species/invasive-plants/garlic-mustard/?gclid=CjwKCAiAmsurBhBvEiwA6e-WPOPJQ4V66DnY171j2YuNWajlL5Sb1hhrDK9CJZMcJ8MEDaKrETS8RoCYREQAvD_BwE

