

DAFM Plant Pest Factsheet

Peronospora aquilegiicola



Fig 1: *Peronospora aquilegiicola* symptoms on *Aquilegia* leaves

Pest Characteristics

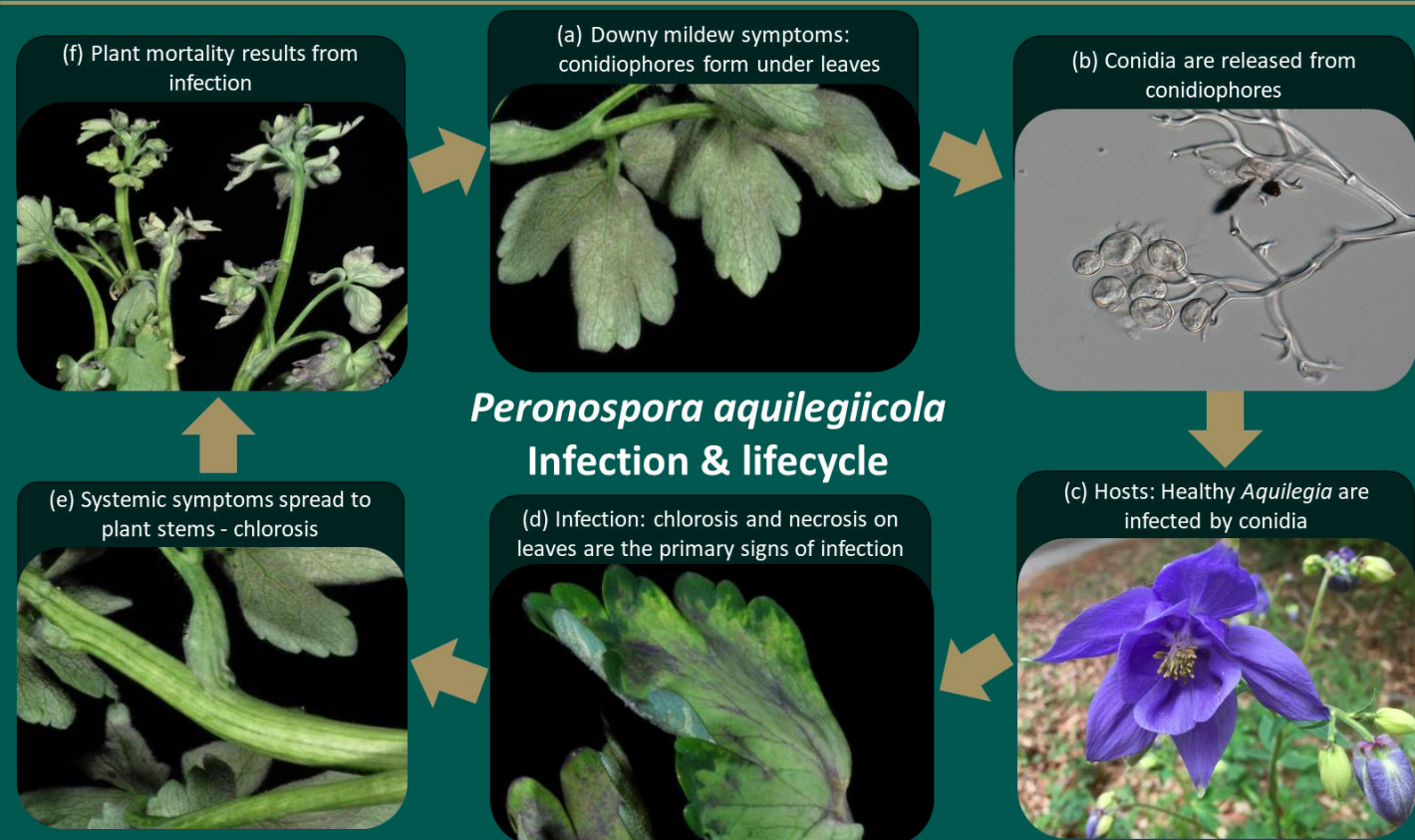
- **Pest:** *Peronospora aquilegiicola*
- **Hosts:** Columbine flowers (*Aquilegia* species) including *A. alpina*, *A. buergeriana*, *A. flabellate*, *A. vulgaris* and *Semiaquilegia adoxoides*.
- **Invasive Risk:** Symptoms of a downy mildew disease afflicting ornamental *Aquilegia* plants were first reported in the UK in 2013. Downy mildew on *Aquilegia* was unknown prior to these reports and this led to the discovery of a new oomycete pathogen: *P. aquilegiicola*. The pest appears to have originated in Eastern Asia, though how it was introduced into the UK is still unknown. This pest is now widespread throughout England and Wales, and has since spread to Germany. *Aquilegia* plants are widely used in Ireland as ornamentals and *A. vulgaris* is a widespread native wildflower.
- **Entry Pathways:** The pest is highly likely to be introduced via trade in *Aquilegia* plants and seeds between the UK and Ireland. The pest could also be spread from the UK to Ireland via natural dispersal (wind).
- **Adaptability:** The disease has been recorded throughout England and Wales, indicating it will be well suited to establishment in the Irish climate.
- **Impact:** Most reports of the disease are from UK gardeners, there have also been several outbreaks in Germany which are likely to be the result of spread from the UK. One reported outbreak in Germany was on a nursery production site which led to the destruction of over 87,000 infested plants.
- **Visual Symptoms:** *Aquilegia* downy mildew initially appears as chlorosis on the surface of leaves, infestation leads to necrosis (dark patches) on leaves (Fig 1 & 2). Eventually, a visually distinctive coat of conidiophores develops on the underside of infested leaves.



Fig 2: Healthy Columbine flowers (a), conidiophores with conidia: under microscope (b), on leaves (c)



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- **Lifecycle:** *Peronospora aquilegiicola* produces a layer of conidiophores on the underside of infested *Aquilegia* and *Semiaquilegia* leaves. Conidiophores produce the conidia (asexual spores) from their tips. These conidia are the means of the pathogens dispersal to new locations and infecting new host plants. Conidia are spread from leaves by rain splash and wind. When conidia make contact with a new host plant they germinate: producing growths called hyphae, that penetrate the outer layer of roots or leaves initiating the infection process. The pathogen can overwinter as conidia (these can survive in soil for several years) or infested plant material (including seeds).
- **Distribution:** This pest appears to be native to East Asia: South Korea (and likely China), where there are wild host plants of the genus *Semiaquilegia*, a genus closely related to the genus *Aquilegia*. To date, symptoms of the disease have only been reported in the UK (2013) and Germany (2020).
- **Control:** There are no control options available for treating infestations.
- **If suspected:** If you find a suspected specimen please submit images to DAFM at: plantpestreport@agriculture.gov.ie

Photo credits: All images used in Figures 1, 2 and lifecycle were obtained from the EPPO *P. aquilegiicola* (<https://gd.eppo.int/taxon/PEROQA/photos>) and *A. vulgaris* (<https://gd.eppo.int/taxon/AQIVU/photos>) images repositories.

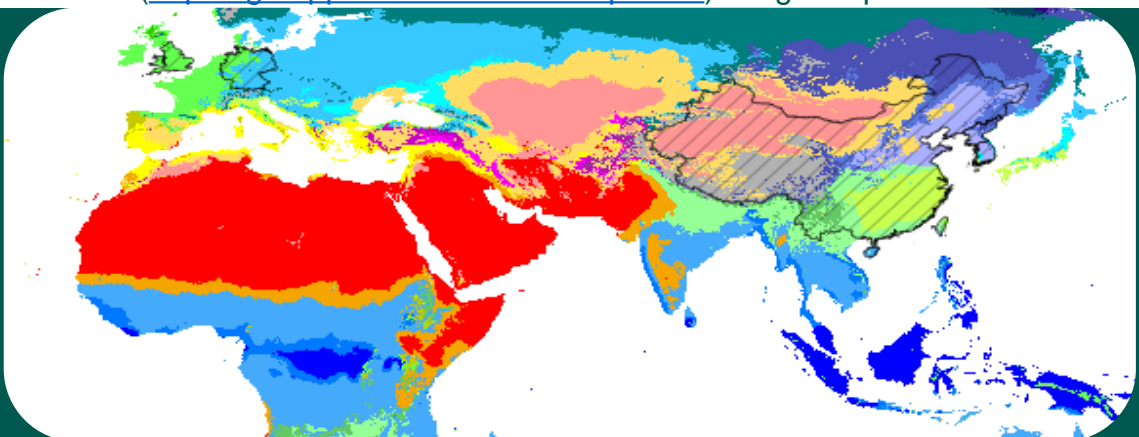


Fig 3: Known global distribution (hashed lines) of *P. aquilegiicola* overlaid on climate classifications of regions



An Roinn Talmhaíochta,
Bia agus Mara
Department of Agriculture,
Food and the Marine