

## Beech (*Fagus* spp.) diseases

### Beech Leaf Disease (BLD)



#### Introduction

This disease affects native and ornamental beech (*Fagus* spp.) trees, and can kill beech trees of all ages, causing a big impact on forested areas.

The causative agent of beech leaf disease is *Litylenchus crenatae*, a nematode species native to Japan.

First reported in Ohio in 2012, the disease rapidly spread into neighbouring areas. The disease is spreading through forest areas in Easter USA and Canada [[See distribution map](#)].

The disease is primarily spread through movement of infested plant material including beech nuts, and potentially spread with feeding from birds and insects. Human-mediated transport, such as contaminated tools, footwear, clothing, and vehicles carrying plant debris or soil from infested areas, is also considered a likely pathway of spread.

#### Host

The disease was first reported on America beech (*Fagus grandifolia*), but it has also been observed in European beech (*Fagus sylvatica*) and oriental beech (*Fagus orientalis*). Additionally, Chinese beech (*Fagus englenaria*) is also considered to be a potential host. The disease may also affect other *Fagus* species.

#### Biology

BLD is caused by the foliar nematode *Litylenchus crenatae*, which has been isolated from the symptomatic buds and leaves. However, in few cases, the nematode has also been found on asymptomatic bud and leaf tissue.

Nematode populations increase in the leaves during the trees' growing season, showing a peak in numbers in late summer and early autumn. After numbers have built up, nematodes migrate to the newly formed buds.

The nematodes spend the autumn and winter in the buds and can also overwinter on leaves on the ground. The nematodes feed on the bud tissue, causing tissue deformation that affects leaf development and leads to reduced leaf expansion. In severe or repeated infections, trees may experience reduced canopy density, progressive decline, and potentially mortality, particularly in young or stressed individuals.

#### Symptoms

For details of the symptoms, scan or click on the QR code to access the accompanying poster.



#### More information

- Observatree: [https://www.observatree.org.uk/media/1694/22\\_0001\\_one-off-literature-observatree-guide-beech-leaf-disease\\_wip08.pdf](https://www.observatree.org.uk/media/1694/22_0001_one-off-literature-observatree-guide-beech-leaf-disease_wip08.pdf)
- EPPO Global Database: <https://gd.eppo.int/taxon/LITYMC>
- Forest Pathology: <https://doi.org/10.1111/efp.12599>Digital Object Identifier (DOI).
- Penn State Extension: <https://extension.psu.edu/beech-leaf-disease>
- Cornell Integrated Pest Management: <https://cals.cornell.edu/integrated-pest-management/outreach-education/fact-sheets/beech-leaf-disease>

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## Petrakia leafspot (*Petrakia liobae*)



### Introduction

*Petrakia* is a pathogenic fungus (*Petrakia liobae*) that causes leaf spot disease on beech trees (*Fagus* spp.). The disease spread relatively slow and is unlikely to result in the death of mature trees. However, it reduces tree health and visual appeal, especially young beech trees.

The fungus was first discovered in Switzerland and Germany in 2008, and has subsequently been found in Austria, France, Slovakia and Slovenia. It was thought to be originally from Japan, but research has shown that it is a different species from the closely related *Petrakia fagi*, so the origin of the species remains unknown. It therefore remains unclear whether this is an overlooked native pathogen now becoming more apparent due to environmental change, or an introduced invasive species.

Dispersal is primarily through fungal spores, and potentially through the movement of infected plant material.

### Host

It has been found on European *Fagus* species: *F. sylvatica* and *F. orientalis*.

It has also been reported on hornbeam (*Carpinus betulus*) in heavily infested areas.

### Biology

*Petrakia liobae* is an ascomycete fungus with two reproductive phases: sexual and asexual.

The fungus can overwinter in infected leaf litter, and spread to nearby hosts during the following growing season.

In spring, dark, blackish-brown sexual fruiting bodies develop on fallen, infected leaves in the litter layer. Around April–May, coinciding with the emergence of new beech foliage, spores are released and dispersed by wind, leading to primary infections of young leaves, particularly in the lower canopy and on young beech trees.

Following infection, small brown lesions develop on the leaves. Later in the season (typically June–October), white asexual spore bodies are produced on these lesions. These asexual spores drive secondary infections within the same growing season.

The pathogen is polycyclic, meaning it can undergo multiple infection cycles within a single growing season, particularly under humid conditions that favour its spread.

### Symptoms

For details of the symptoms, scan or click on the QR code to access the accompanying poster.



### More information

- EPPO Global Database: [Petrakia liobae \(PTRKLI\)\[Overview\]](#) | EPPO Global Database
- Gov.UK: <https://planthealthportal.defra.gov.uk/assets/factsheets/Pest-Alert-Petrakia-liobae.pdf>
- Wald Wissen.net: <https://www.waldwissen.net/en/forestry/forest-protection/invasive-species/petrakia-liobae-leaf-spot-of-common-beech>

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