

Field Identification Guide

European mountain ash ringspot associated virus



Photograph: Adrian Fox, FERA Science Ltd

European mountain ash ringspot associated virus

The European mountain ash ringspot associated virus (EMARaV) is a pathogen that infects mountain ash trees (*Sorbus aucuparia*). The pathogen attacks the leaves of its hosts where it causes mottling and discoloration. In extreme cases the productivity of the tree can be affected, which can result in its gradual decline.

Species affected	Mountain ash (or rowan) is the main host for this disease. The virus is also known to infect other <i>Sorbus</i> species including whitebeam (<i>S. aria</i>), wild service tree (<i>S. torminalis</i>) and service tree (<i>S. domestica</i>). Additionally, the virus has been reported from ornamental <i>Sorbus</i> species.
Signs and symptoms	The main symptom of this disease is a discoloration and mottling of the leaves in infected hosts. Early symptoms are a chlorotic speckling of the leaves, which develops into mottling, ringspots and oak leaf patterning. In addition, infected trees may eventually decline as productivity is reduced and they become more susceptible to other damaging factors. A general decline in mountain ash trees can also be caused by abiotic factors such as drought and root compaction and biotic factors such as honey fungus (<i>Armillaria</i> spp.) which affect the root systems of the tree. Chlorotic discoloration of mountain ash leaves can also be caused by abiotic factors such as an excess of lime or chalk. However, this chlorosis occurs in a uniform way and does not present the patterning of EMARaV-induced chlorosis. The leaves of mountain ash can also be affected by mountain ash juniper rust (<i>Gymnosporangium cornutum</i>), to which it is a secondary host. This fungus can be distinguished from EMARaV because it causes concave yellow spots on the leaves with outgrowths on the lower leaf surface. The rowan gall mite (<i>Eriophyes sorbi</i>) can cause a similar chlorotic speckling on the leaves of mountain ash to that of EMARaV. However, on close inspection irregular swellings/galls can be seen on the undersides of the affected leaves, which do not occur in EMARaV infections. Light green/yellow galls of the pear leaf blister mite (<i>Eriophyes pyri</i>) and the gall mite (<i>Phyllocoptes sorbeus</i>) can also occur on mountain ash foliage.

Timing	Symptoms are visible on the foliage during the growing season and branch dieback can be visible all year round.
Biosecurity	Vegetative transmission is typical for plant virus infection, and it is thought that EMARaV can move between hosts via grafting wounds and cuttings. Transmission via seed, pollen or soil has not been reported. It is unclear whether mites are involved in the introduction of the virus to new hosts and spread of the disease. Full biosecurity measures should be followed at all times. Clean and disinfect all pruning/sampling tools between trees. Clean and spray boots with disinfectant before and after any site visit. Remember to check clothing such as collars, inside boots, hoods and outer pockets too for any tree-derived debris. Keep vehicles on hard tracks and ensure that they are kept clean so that they are easier to disinfect when necessary and check them over for any plant material before leaving an infected site.
Reporting requirements	If you find this disease, please report it through Tree Alert (https://treealert.forestresearch.gov.uk). In Northern Ireland please report via the TreeCheck website (www.treecheck.net) or phone app, or by emailing planthealth@daera-ni.gov.uk For traded plants and any non-tree hosts please email planthealth.info@apha.gov.uk (England & Wales), or hort.marketing@gov.scot (Scotland).

Based on information available in November 2017.

Signs and symptoms



Photograph: Adrian Fox, FERA Science Ltd

Mountain ash leaf infected by European mountain ash ringspot associated virus.

Signs and symptoms



Photograph: Adrian Fox, FERA Science Ltd

'Oak leaf' pattering and ringspots on mountain ash leaflets caused by European mountain ash ringspot associated virus.

Signs and symptoms



Photograph: Adrian Fox, FERA Science Ltd

Mottling of leaf tissue caused by the European mountain ash ringspot associated virus (the small patches of dead tissue are probably caused by activity of other organisms).

Look-alike signs and symptoms



Photograph: Thelma Evans, Forestry Commission

The symptoms shown here are typical of the rowan gall mite (*Eriophyes sorbi*) and the pear leaf blister mite (*E. pyri*).

Look-alike signs and symptoms



Photograph: George Gate, Forest Research

Damage to the upper surface of a mountain ash leaf caused by the mountain ash juniper rust fungus (*Gymnosporangium cornutum*).

Look-alike signs and symptoms



Photograph: George Gate, Forest Research

Rust outgrowths from the lower surface of mountain ash leaflets.

Look-alike signs and symptoms



Photograph: Robert Strouts, Forestry Commission

Damage to mountain ash leaflets caused by the fungal pathogen *Venturia aucupariae*.

Look-alike signs and symptoms



Photograph: Robert Strouts, Forestry Commission

Yellow mottling of leaflets of mountain ash caused by feeding activity of leafhoppers.

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Observatree aims to create a tree-health early-warning system using citizen science.

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This booklet forms part of a set that supports Observatree volunteers when out looking for priority pests and diseases. It supplements face-to-face training and is not intended as a full or detailed description. It will also be useful for others who have some knowledge of the particular pest or disease and understand how to look for these. Further information is available online from the websites listed below:

www.observatree.org.uk

www.forestresearch.gov.uk/tools_and_resources/fthr/pest-and-disease-resources/

www.gov.uk/guidance/prevent-the-introduction-and-spread-of-tree-pests-and-diseases

<https://planthealthportal.defra.gov.uk>