

## Horse chestnut leaf miner Identification, Biology & Management

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The horse chestnut leaf miner (*Cameraria ohridella*) is a moth of the lepidopteran family Gracillariidae. Its origins are unknown (probably Asia), and was first reported in Europe in 1985. Its larvae are leaf miners on the common horse chestnut (*Aesculus hippocastanum*), causing significant aesthetic damage to the tree.

### Symptoms

Larvae of *C. ohridella* mine within the leaves of horse chestnut (Figure 1). Up to 700 leaf mines have been recorded on a single leaf under favourable conditions. The larva tunnels into the leaves of the tree, causing physical damage to leaf tissue and stunting of future growth. Infected leaves are covered in small brown patches which spread rapidly across the entire tree, giving an autumnal appearance (these patches are similar to damage caused by the fungus *Guignardia aesculi*, but can be distinguished by their more regular size and shape). Severely damaged leaves shrivel and turn brown by late summer and fall early, well before normal leaf fall in the autumn. When new leaves grow they are also infected. The spread and establishment of *C. ohridella* is of particular concern because once established, the moth appears always to maintain exceptionally high rates of infestation without any evidence of decline. In European towns and cities there has been no decrease in populations even after many years, and severe damage to horse chestnuts has occurred on an annual basis, greatly impairing the visual appearance of the trees (Figure 2). Over time repeated infestation can kill young trees and/or show a progressive decline in health as a direct consequence of attack. Climate and/or interactions with other pests and diseases can influence the impact of *C. ohridella* on trees.

Figure 1: Symptoms of horse chestnut leaf miner



### Causal Agent

Adult moths appear from April onwards. They emerge in the early morning and fly to the tree trunks where they mate. From May until August the females lay their eggs along or near the lateral veins of the leaves on the upper epidermis. A female can produce on average 20-40 eggs which hatch after 2-3 weeks. Larval development takes up to 4 weeks to complete. During this time larvae feed on the inside of the leaves but leave the upper and lower epidermis intact. Pupae develop in a silken cocoon for 2 weeks before they are fully developed however, the overwintering generation can remain at this stage for 6 or 7 months.

Figure 2: Disfigured tree caused by severe infestation



The moth is able to live at temperatures as low as -23 °C, although it thrives in warmer climates, where it can achieve as many as five generations a year. The hotter and drier the climate the quicker the lifecycle and consequently the higher number of generations.

## Control

Check for the presence of this pest. The leaf should be held up to the light. If it is a horse chestnut leaf miner burrow, it will be possible to identify a larva, chrysalis, or larval frass within the leaf.

Damage can be reduced by removing fallen leaves during the autumn and winter and either composting them thoroughly, to destroy the overwintering pupae, or if the leaves are collected into smaller heaps, by covering them with a layer of soil or other plant material to prevent adult emergence in the following spring. Burning of infected leaves is also recommended.

Its natural enemies are parasitic wasps, but there are few species present in Europe. Consequently, natural control measures based on bio-control are limited.

Contact insecticides such as spray oil in combination with a synthetic pyrethroid offer the best form of control. They are mainly formulated as water based sprays and applied when leaf miners are present.

The insect growth regulator Dimlin Flo is highly recommended due to its persistence within the tree providing long term control. Dimlin Flo kills only moths and caterpillars, having no effect against beneficial insects. Application early in the growing season is recommended when adult moths are observed.



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