

Cameraria ohridella

Horse chestnut leaf miner



A leaf-mining moth whose larvae feed between the upper and lower surfaces (epidermises) of the leaf leaving damaged tracks or mines behind. The lower canopy is usually first to show symptoms.

Mines appear translucent. With repeated attacks mines can merge and reduce photosynthetic ability to the extent that the leaf dries, curls and falls prematurely. Early leaf fall can affect 70% or more of the tree which can appear autumnal by August. From a distance damage may be confused with *Guignardia aesculi* but on closer inspection is considerably different.

Adult moths appear from April onwards from overwintered pupae. They are only 5mm long and lay eggs along the lateral veins on the upper surface of the leaf. Larvae moult up to 5 times whilst feeding in the leaf over a 4-week period, and finally pupate for 2 weeks – although pupation can take up to 6–7 months when overwintering. Further generations are produced throughout the year: up to 5 have been recorded. Pupae overwinter in fallen leaf litter and are extremely tolerant of low temperatures.

Trees can become very disfigured quickly and repeatedly, leading to pressure for removal. However, there is no evidence to suggest a significant impact on tree health as they re-flush normally despite many successive years of leaf-miner damage. The moth will colonise an area quickly and can be transported many miles to set up new areas of infection by passive means: vehicles, trains and prevailing wind direction.

Distribution: Widespread throughout the UK and will spread to all areas.

Species affected: Principal host is *A. hippocastanum*. Other Asian horse chestnuts appear to be moderately resistant as do the majority of the North American species. Hybrids vary in resistance but *A x carnea* shows a significant resistance to this pest.

Treatment: See Table 1a.



Pseudomonas syringae pv. *aesculi*

Bleeding canker of horse chestnut



A bacterial canker that causes bleeding from the bark of any part of the trunk or main branches in trees of all ages.

The common horse chestnut and red horse chestnut are particularly susceptible with other species being less so, notably *Aesculus indica* and *Aesculus flava*. Young trees are particularly vulnerable as necrosis can completely girdle the main stem in a short time. Mature trees can be seriously disfigured, owing to the death of large sections of the crown as a result of disease in the supporting vascular tissues. Even very large trees can be killed in a few years but there are many trees in which the disease has stabilised, remaining only in localised patches of bark. Individual trees vary in susceptibility, some succumbing very quickly whilst others either never develop the symptoms or recover after an episode of the disease.

In the early stage of bark-killing, the only externally visible sign is usually the appearance of scattered bleeding points, from which drops of gummy liquid ooze. When this exudation begins, often in the spring, the liquid is dark but transparent, but later it becomes more opaque and acquires a rusty red, yellow-brown or blackish colour. As the fluid accumulates during the

summer it can run some way down the tree before drying to leave a dark, brittle crust near the point of exit. Renewed bleeding may be seen later in the year, often in autumn. This suggests that pathogen activity is greatest under the moist, mild conditions of spring and autumn.

In some cases, the bark death associated with bleeding extends for many metres along the length of the affected branch or stem. The branch or stem may eventually die as a result of continued bark-killing, where this leads to girdling. The affected areas of inner bark can be seen by paring away the outer layers. They show an orange-brown discolouration, containing numerous dark lines, where the host appears to have laid down temporary barriers to the spread of the bacteria. A spreading lesion will usually show a diffuse edge, while a stabilised lesion will have a sharper boundary with the surrounding healthy bark.

The extent of the lesions becomes increasingly apparent after several months, when the affected areas of bark begin to crack and eventually fall away. Strongly developing rolls of new bark and wood develop along the edges of the exposed wood if the disease is stabilising. Secondary decay can set in later, as shown by the appearance of fruit bodies of wood-rotting fungi.

Distribution: Widespread and common.

Species affected: Common horse chestnut and red horse chestnut are particularly susceptible with other species being less so, notably *Aesculus indica* and *Aesculus flava*.

Treatment: There is currently no commercially available treatment. Affected trees should be individually monitored in order to see whether their condition stabilises. The risk of spreading the bacterium between trees should be reduced by sterilising tools and by burning bark and arisings from affected trees. Improving soil conditions and thereby the vitality of the tree can help the recovery of infected trees.

