

‘Host of the month’ is a series of information sheets and blogs that highlight a tree host and their associated priority pests and diseases that are best seen and recorded in that month. For October we’re looking at Maples (*Acer* species), Asian longhorn beetle, and Citrus longhorn beetle.

Aside from seeds and fruits there are few food sources derived from trees, but several species of maple provide what is arguably the best known, Maple syrup. Three species provide the majority of syrup made in north-eastern North America: Sugar maple (*A. saccharum*), Black maple (*A. nigrum*), and Red maple (*A. rubrum*). Trees are tapped in late winter as sap starts to rise, each tree producing up to 12 litres of sap per day (fig. 1). It takes around 40 litres of sap to make 1 litre of syrup, the excess water traditionally being driven off by heating and concentrating the sugars and distinctive flavours.



Figure 1: Maple sap harvest (T. Davis Sydnor, The Ohio State University, Bugwood.org)

Maples are a part of the *Sapindaceae*, a diverse family which also includes the Horse chestnuts (*Aesculus*). There are around 132 maple species, many of them native to Asia though they are also found across Europe and North America. Most species have the familiar palmately lobed leaves, with some exceptions like Box-elder (*A. negundo*) and Paperbark maple (*A. griseum*) which have trifoliate leaves, or Hornbeam maple (*A. carpinifolium*) which has simple leaves with pinnate veins. However, all species have leaves arranged in opposite pairs on their shoots and winged fruits known as samaras – or more commonly ‘helicopters’.

In the UK only Field maple (*A. campestre*) is regarded as native, but there are two other common species, Sycamore (*A. pseudoplatanus*) and Norway maple (*A. platanoides*), the best characters to separate them being leaf (fig. 2) and fruit (fig. 3) characters. Sap colour of the leaf stalk (petiole) can be helpful, in Sycamore it is clear whilst in the Norway and Field maple it is a white latex. In late spring and early summer flower arrangement and timing can also be useful; Norway maple for example flowers before the leaves emerge, clothing branches in acid-green that are recognisable from quite a distance. In comparison Field maple and Sycamore flower once the leaves are out.

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Figure 2: Left to right - eaves of field maple (left), sycamore (middle), and Norway maple (right) - £1 coin for scale.



Figure 3: Winged fruits of field maple (left), sycamore (middle), and Norway maple (right)

Priority pests – Asian longhorn beetle (*Anoplophora glabripennis*) and Citrus longhorn beetle (*A. chinensis*)

In 2007 an amateur entomologist reported seeing an adult Asian longhorn beetle (ALB) near Paddock Wood in Kent, but the beetle evaded capture and the record couldn't be verified. In 2009 an adult ALB was captured in a nearby garden which triggered annual surveys in the area. No other beetles were found in 2010 or 2011 but in 2012 Forest Research scientists discovered larvae in a Grey willow (*Salix cinerea*) which were identified as being ALB. During the subsequent eradication programme Sycamore was identified as the main host species, a single tree at the centre of the outbreak had 498 exit holes, 98% of all exit holes recorded. The same tree contained 155 live larvae! Following felling of 2229 trees and extensive monitoring the eradication programme was declared successful in 2019.

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Maples are a preferred host for both ALB and Citrus long horn beetle (CLB) though they have also been found on a wide range of other broadleaved trees. Both beetles are native to eastern Asia and have now been reported in the USA and across Europe with the main entry pathways being wooden packaging materials (ALB) and live plants (CLB). Neither ALB nor CLB are currently known to be present in the UK.

Identification

The adult beetles are very similar in appearance but one character that distinguishes them is the rough patch of raised bumps at the front end of the elytra (wing-cases) in CLB, in ALB they are completely smooth (fig. 3). Both are 2 - 4 cm long and glossy black with pale yellow or white markings. The segmented antennae are longer than the body and are also glossy black but with light blue-white banding (fig. 4).

Adult females chew 'egg pits' into the surface of host trees, often near branch junctions (fig. 6). The uniformly pale cream-coloured larvae hatch and tunnel into the stem, eventually growing to 3-6cm in length (fig. 4) As they grow they chew out tunnels which can be 30cm long and 1 cm in diameter, and these disrupt the movement of water and nutrients in the tree. Once mature the larvae pupate, emerging as adults via 1cm diameter perfectly circular exit holes (fig. 6). In ALB the exit holes are on the branches and upper parts of the stem, in CLB they're on the lower part of the stem and any exposed roots.



Figure 4: Left to right - Asian Longhorn beetle (*© Crown copyright, Forest Research*), citrus longhorn beetle (*David Crossley FBIPP QEP, © Crown copyright courtesy Fera Science Ltd.*) and ALB larva (*Thomas B. Denholm, New Jersey Department of Agriculture, Bugwood.org*).

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Symptoms

Much of the life cycle of these beetles feed within the tree with few external symptoms until infestations reach very high levels which makes them relatively difficult to detect. However, there are six symptoms that may be seen; crown/branch dieback, exit holes, egg-pits, frass, bark cracking and adult feeding damage.

Like many pests and diseases which disrupt water and nutrient transport within a tree there is often discoloration, dieback or death of branches in the crown of infested trees (fig. 5). In ALB and CLB infestations these symptoms are likely to be combined with the most obvious sign of infestation, the large circular exit holes (fig. 6). Binoculars can be helpful when looking for those of ALB which are usually higher up in the tree. Egg pits are less easy to find but can sometimes be accompanied by sap or resin flow.



Figure 5: *left* - maple with signs of crown dieback due to ALB (Dennis Haugen, USDA Forest Service, Bugwood.org), and *right* - maple trunks with a heavy infestation of ALB and multiple exit holes (Pennsylvania Department of Conservation and Natural Resources – Forestry, Bugwood.com)

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Figure 6: left – egg-laying pits (*Dennis Haugen as above*) and right - circular exit hole made by ALB (*Pennsylvania Department of Conservation and Natural Resources – Forestry, Bugwood.com*).

Larval tunnelling activity produces frass (fig. 7) and this can sometimes be found around the base of infested trees, appearing like fine wood shavings. Longitudinal cracks often form in the bark because of callus tissue growth produced by the tree in response to the tunnelling (fig. 5).



Figure 7: left to right – frass from ALB boring activity gathering in a branch fork (*Robert A. Haack, USDA Forest Service, Bugwood.org*), foliar feeding damage by ALB (*Pennsylvania Department of Conservation and Natural Resources – Forestry, Bugwood.org*), and ALB feeding damage on young twigs (*Dean Morewood, Health Canada, Bugwood.org*)

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Adult feeding damage tends to occur high up in the canopy and is therefore the least easy symptom to see. The beetles tend to eat the veins of leaves whilst leaving the leaf blade (lamina) largely intact (fig. 5). Damage to both young bark and foliage has a ragged appearance where the beetle mandibles have torn the surface layers of the bark (fig. 5).

Lookalikes

Goat moth (*Cossus cossus*) and **leopard moth (*Zeuzera pyrina*)** are UK native species with larvae that feed within the wood of host trees that give rise to symptoms similar to those of ALB and CLB. Neither produce the perfectly circular exit holes of ALB and CLB but otherwise extraction and examination of the larvae can be the only way to positively identify them (fig. 8).

Timberman beetle (*Acanthocinus aedilis*) is a native longhorn beetle species that has its stronghold in the Highlands of Scotland. It is similar in appearance to adult ALB and CLB but has a brown body without any white markings (fig. 9). The larvae feed mainly on dead or dying Scots pine rather than live broadleaves trees and create an oval rather than circular exit hole.

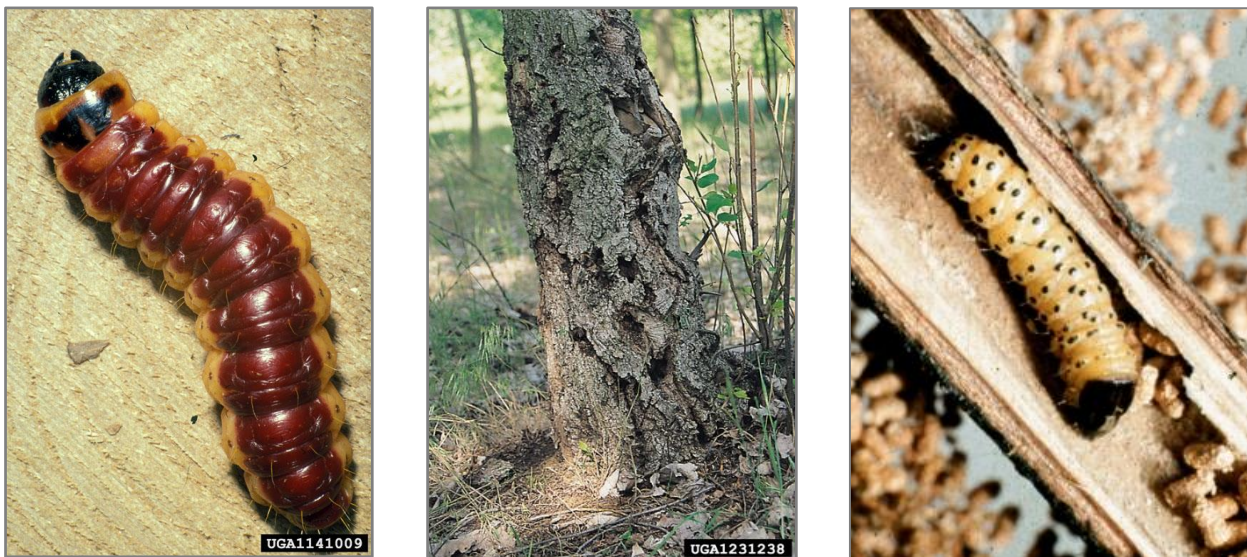


Figure 8: left to right - European goat moth larvae and typical goat moth damage (both images by Gyorgy Csoka, Hungary Forest Research Institute, Bugwood.org), and leopard moth larvae (Petr Kapitola, Central Institute for Supervising and Testing in Agriculture, Bugwood.org).

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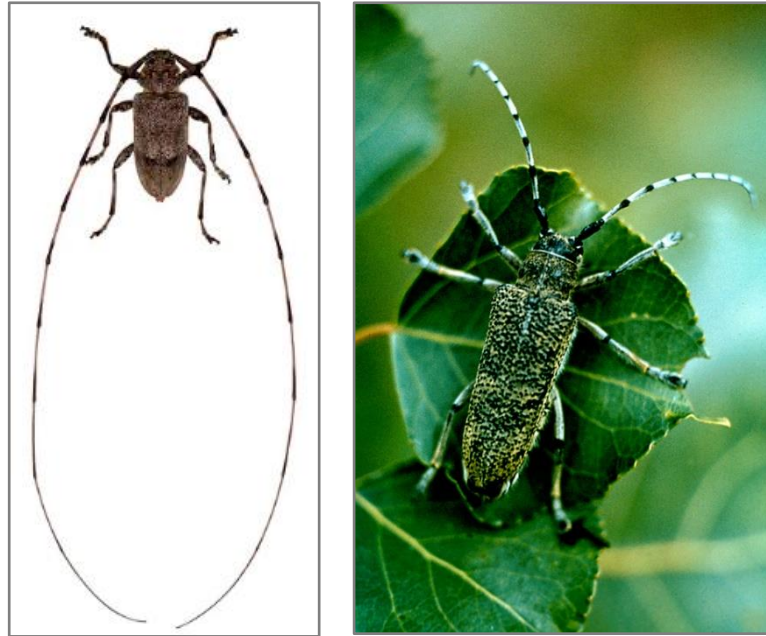


Figure 9: (left) Timberman beetle (www.ukbeetles.co.uk) and (right) Large poplar beetle (Jean Pinon, Institut National de la Recherche Agronomique, Bugwod.org).

Large poplar beetle (*Saperda carcharias*) larvae are found mainly in the trunks of aspen (*Populus tremula*) and occasionally other poplars (fig. 9), willows and sometimes oaks. Like ALB and CLB the larvae are a uniform pale cream colour.

For more information on beetles in the UK such as the Timberman and Large poplar beetles the [UK Beetles website](#) is a useful resource.

Reporting

ALB and CLB are notifiable pests so if you find them you must report them. Please report sightings via [TreeAlert](#).

Check the Observatree website for more information and resources on [Asian longhorn beetle](#) and [Citrus longhorn beetle](#).

Matt Parratt, Forest Research, September 2024

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