



Department  
for Environment  
Food & Rural Affairs

## Plant Pest Factsheet

### Box Tree Caterpillar

### *Cydalima perspectalis*



Fig 1. Late stage *Cydalima perspectalis* larva on a box plant leaf. It grows to a maximum length of 4 cm. © Chris Malumphy.

## Background

The box tree caterpillar, *Cydalima perspectalis*, is native to Asia and after an initial finding in Germany in 2006 it has spread through central Europe. Larvae can sometimes cause severe defoliation as they feed on box (*Buxus* spp.). It is thought that the species was originally introduced with imports from China. By 2008, *C. perspectalis* had been reported in five countries in Western Europe. This included England where adult moths were caught in light traps in 2008, in 2009 a nursery in Surrey found *C. perspectalis* larvae causing severe damage. A rapid pest risk assessment on *C. perspectalis* was published by Fera in September 2010 which concluded that the moth is now established in continental Europe. Given the rapid spread of the pest and the possibility that it may reach the UK naturally from Europe, no statutory action should be taken on future UK findings. Therefore, there is no longer a requirement to report new findings of this pest to the Plant Health and Seeds Inspectorate.

## Geographical Distribution

*Cydalima perspectalis* originates from East Asia, and has been recorded in China, India, Iran, Japan and the Republic of Korea. It is now found across most of mainland Europe, the Mediterranean, parts of North Africa, Eastern Canada and parts of Northeastern USA.

Larvae were discovered feeding on box in the southeast of Germany in 2007, around the Baden-Württemberg area. It is thought that the infestation had gone undetected for around two years before that. Since then, *C. perspectalis* has been found in other more northerly locations in Germany, largely around the Rhine. By 2008, *C. perspectalis* larval infestations were also reported in the Netherlands, Switzerland, a small area in France, and in Austria in 2009. The first record of *C. perspectalis* in the UK was in 2007 from east Kent. In the following years three adult moths were found in East Sussex and Surrey in September 2008 and in 2009 damage to box was observed in a Surrey nursery. Further adult findings were reported in Essex and Kent in 2009, and in Kent, Hertfordshire and Bristol in 2010. *Cydalima perspectalis* is now well established in the UK, especially in the south and has rapidly increased in frequency. It is widespread in London and the south-east of England and is spreading further afield. In 2018 it was recorded for the first time in Scotland (south-east Fife) and on the Lizard peninsula in Cornwall. It has also been recorded across Wales. Since 2019 this species has been considered to be a common resident in the UK'.

## Host Plants

In Europe, *C. perspectalis* larvae have only been observed eating species of box (Fig. 1): *Buxus microphylla*, *B. microphylla* var. *insularis*, *B. sempervirens* and *B. sinica*. However, in Asia other reported hosts include *Ilex purpurea* (purple-leaved holly), *Euonymus japonicus* (Japanese spindle plant), and *Euonymus alata* (burning bush).

## Description

The eggs are laid in a flat sheet, overlapping each other, on the underside of box leaves. When first laid, they are almost transparent and difficult to see, becoming pale yellow and as they mature further, the eggs develop a black spot where the head capsule of the caterpillar is forming (Fig. 2).

Newly hatched larvae are coloured greenish yellow with black heads. As the larvae get older the head stays black and the green body develops dark brown stripes. Mature larvae retain the green ground colour to their bodies and develop a striking pattern of thick, black and thin white stripes along the length of the body, with large black dots outlined in white on the dorsal side (Fig. 1). They are up to 4 cm long. The caterpillars produce silk webbing to protect themselves, it is this silk that forms the characteristic webbing that can be seen on box hedges.

The pupae are between 1.5 and 2.0 cm long. They are initially green with dark stripes on the dorsal surface while older pupae turn brown (Fig. 3). They are concealed in a cocoon of white webbing spun among the leaves and twigs.

The adult moths are medium sized with a wingspan of around 4 cm. The most common colour form has a thick dark brown border of uneven width around the edges of white-coloured wings. The forewings have a white extension to the central white portion of the wing which extends into the brown border towards the front of the wing (Fig. 4). The moths are faintly iridescent with the brown areas having a golden sheen, the white parts are tinged with of purple. The body is largely white with a dark brown head and posterior end of the abdomen. There is another less common colour variant where the wings are completely brown, except for a small white streak on the forewing which is in the same position as the white marking described above (Fig. 5).



**Fig. 2** Underside of a box leaf showing a batch of eggs from *Cydalima perspectalis*; each egg is around 1 mm in diameter. © Picture by W. Schön from [www.schmetterlingraupe.de](http://www.schmetterlingraupe.de)



**Fig. 3** Pupa of *Cydalima perspectalis*, which has been removed from the cocoon that it had spun in the box plant. The pupa is a maximum of 2 cm in length. © M. J. van der Straten, Plant Protection Service, the Netherlands



Cydalima perspectalis (DPHNPE) - <https://gd.eppo.int>

**Fig 4. Fig.4 Adult *Cydalima perspectalis* with the typical brown and semi-transparent white wing pattern. The moth has a wingspan of about 4 cm. © EPPO**



Cydalima perspectalis (DPHNPE) - <https://gd.eppo.int>

**Fig 5. The less common colour form of the adult *Cydalima perspectalis*, with almost totally brown wings. © EPPO**



**Fig 6. A box plant affected by *Cydalima perspectalis* larvae, showing skeletonised leaves and dieback. © Chris Malumphy**



Cydalima perspectalis (DPHNPE) - <https://gd.eppo.int>

**Fig 7. *Cydalima perspectalis* larvae feeding on box, surrounded by loose webbing. © EPPO**

## Biology

In warmer parts of Europe *C. perspectalis* can have up to four generations in a year. In colder climates it is recorded as having two generations. At a temperature of 20°C development time from egg hatching to adult emergence is around 40 days, though it can complete its lifecycle at a temperature of 15°C. *Cydalima perspectalis* overwinters as an early stage larva spinning a cocoon between two box leaves in autumn, it then overwinters in the cocoon completing its development the following spring.

## Dispersal and Detection

The most likely way for *C. perspectalis* to be moved around the UK is with horticultural trade and the sale and movement of infested box plants (*Buxus* spp.). Adult moths are good flyers, they can naturally spread 1 to 3 miles a year in Europe. Dispersal over long distances is likely to be human-assisted and it is likely that this has been the main driving factor behind its spread across the UK and Europe.

Signs of damage may not always be obvious at the beginning of an infestation because the young larvae hide among the foliage and stems. Signs to look out for are windowing (eating the lower surfaces of the leaves only and leaving the upper surface intact) and skeletonization of the leaves (when the larvae feed on the leaves and just leave the veins and midrib) with the remaining leaf tissue becoming dry and brittle (Fig 6). It is older larvae eating the bark and girdling sections that can lead to death of the plant. Signs of feeding include green frass (excrement) which dries to brown and can form a layer underneath affected plants, and webbing between the leaves. Shed head capsules can also be found. The female moths lay their eggs on the underside of the leaves of boxwoods so the eggs can be hard to detect (Fig 1).

## Economic Impact

Complete defoliation of ornamental box plants can occur with whole hedges or trees being affected. Box is widely planted as an ornamental shrub in gardens and parks. The defoliation and dieback are unsightly and reduce the amenity value of the plants.

In addition to being a threat to ornamental box plants, *C. perspectalis* is also a threat to native box trees in the UK. It has been reported to have caused significant damage to native box trees in Switzerland (Marc Kenis, *pers. comm.*). Though not commonly found in the wild in Britain, native box plants are present on isolated sites with chalky soils in southern England, notably Box Hill in Surrey.

## Advisory Information

As no statutory action is being taken on UK findings of *Cydalima perspectalis*, there is no longer a requirement to report new findings of this pest to the relevant competent authority.

For more information on *Cydalima perspectalis* and its control visit the **Royal Horticultural Society's** website on box tree caterpillar :- <https://www.rhs.org.uk/biodiversity/box-tree-caterpillar>

Suspected outbreaks of any other non-native plant pest should still be reported to the relevant authority:

For **England and Wales**, contact your local **APHA Plant Health and Seeds Inspector** or the **PHSI Headquarters**, York.

Tel: 0300 1000 313

Email: [planthealth.info@apha.gov.uk](mailto:planthealth.info@apha.gov.uk)

For **Scotland**, contact the **Scottish Government's Horticulture and Marketing Unit**:

Email: [hort.marketing@gov.scot](mailto:hort.marketing@gov.scot)

For **Northern Ireland**, contact the **DAERA Plant Health Inspection Branch**:

Tel: 0300 200 7847 Email: [planthealth@daera-ni.gov.uk](mailto:planthealth@daera-ni.gov.uk)

Web: <https://www.daera-ni.gov.uk/topics/plant-and-tree-health>

For additional information on UK Plant Health please see:

<https://planthealthportal.defra.gov.uk/pests-and-diseases/uk-plant-health-risk-register/>

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

<https://www.gov.uk/plant-health-controls>

<http://www.gov.scot/Topics/farmingrural/Agriculture/plant/PlantHealth/PlantDiseases>

<https://www.daera-ni.gov.uk>

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