



## Omnivorus leafroller

### *Platynota stultana*



**Figure 1.** *Platynota stultana* larva. Photo: Jack Kelly Clark, courtesy University of California Statewide IPM Program.

### Background

*Platynota stultana*, commonly known as the omnivorous leafroller, is a moth native to North America, where the larvae can cause economic damage to a wide range of crops. It is now found in a number of glasshouses in Spain, having been present for several years. It is not currently known to be in the UK at present. This Plant Pest Factsheet provides information on detection, biology and control of the species.

### Geographical Distribution

*Platynota stultana* is native to north-western Mexico and south-western USA (Arizona and Texas). Over the last century, it has also become widespread in California and Florida, and in the mid-1980s was accidentally introduced to Hawaii, and is now also established there. There are also reports from other states in the USA, but at least some of the East coast records are not considered reliable and some records, e.g., Virginia, may refer to outbreaks in protected cultivation.

In Europe, *P. stultana* has been detected in two regions in Spain, where it is thought to have been present since about 2005. In Almería it has been recorded on crops of pepper (*Capsicum annuum*), aubergine (*Solanum melongena*), green bean (*Phaseolus vulgaris*) and cucumber (*Cucumis sativus*). In Murcia, no economic damage has been reported. Control measures are currently being applied against the pest in both regions. *Platynota stultana* has been intercepted in the USA on two consignments of sweet peppers exported from Spain in December 2011.

In the UK, the single nursery outbreak in 2004 was eradicated, and *P. stultana* is no longer found in this country. The distribution of the species in North America (excluding East

coast records) suggests that *P. stultana* is not likely to be able to survive outdoors overwinter in the UK; but experimental developmental threshold temperatures for this species are similar to other tortricids that are capable of overwintering in the UK.



**Figure 2.** *Platynota stultana* adults. Set specimens of male (top) and female (bottom). In life, the moth rests with the wings folded over its back in a bell shape, with the hindwings completely hidden. Both images © Todd Gilligan, CSU, Bugwood.org

## Host Plants

This caterpillar is highly polyphagous (as its common name, omnivorous leafroller, suggests), and will feed on many hosts from a large number of plant families. In the USA, *P. stultana* is primarily recorded as a pest of outdoor crops in California, especially grapes (*Vitis*) and stone fruit. It has also been found in protected crops of roses (*Rosa*) in New York State. Other economically important hosts include apples (*Malus*), blackberries and raspberries (*Rubus*), maize (*Zea mays*), tomatoes (*Lycopersicon esculentum*), celery (*Apium graveolans*), bell pepper (*Capsicum annum*), *Sorghum*, soya bean (*Glycine max*) and beans (*Phaseolus*). It has also been recorded feeding on a range of ornamental hosts, including geranium (*Pelargonium*), carnation (*Dianthus*) and *Cyclamen*, as well as walnut (*Jugulans*), pine (*Pinus*), yew (*Taxus*), various grasses (Poaceae), and many others.

## Description

Eggs are flattened ovals and laid in batches which can contain more than 100 overlapping eggs, this egg batch having an overall appearance somewhat resembling pale green fish scales or a flattened pine-cone. Many other micromoths lay egg batches in this way, and it is not possible to identify *P. stultana* eggs to species.

Newly hatched larvae are cream with a brown head and are less than 2 mm long. As they grow older, larvae reach a maximum of 15–19 mm in length and the colour becomes very variable, but is usually grey-green, greenish or cream, with a brown or black head. There are very small whitish spots along the body, and a dark stripe down the centre through which the body contents can be seen moving (Fig. 1). Larvae are similar in appearance to many native Tortricidae, and are very active if disturbed. Pupae are usually hidden inside a rolled leaf and are dark brown.

Adult moths are small, but quite variable in size, with commonly reported ranges from 7 to 13 mm in length (12–25 mm wingspan). They rest with their wings folded against the body

in a tented “bell” shape, in common with most Tortricidae. The wing markings consist of shades of fawn and dark brown, and are again variable in both colour and strength (Fig. 2). Usually, males have a darker brown area at the base of the wings, with a paler area at the tips, which is similar to a number of native species. Females are often slightly larger, and have less distinct markings. The grey labial palps (at the front of the head, much thicker than the antennae) are very long in comparison to the head, and point forwards. While these long palps are comparatively unusual in the Tortricidae, closely related species also have them, for example, the native moth *Sparganothis pilleriana*, or other species of *Platynota* from North America. Other families of moths also contain species with long labial palps. Thus, field identification of any life stage of *P. stultana* is problematic, and confirmation of species is likely to require adults and genitalia dissection by a specialist.

## Biology, Dispersal and Detection

*Platynota stultana* has overlapping generations in warm conditions, with up to 6 complete lifecycles a year observed in California. Eggs take an average of 6 days to hatch at 32°C, but this is temperature dependent, and hatching time increases to about 9 days at 21°C. Newly hatched larvae move upwards, towards the shoot tips, and usually hide between young leaves or in other concealed locations. Larvae in the second instar or older are capable of rolling leaves (spinning them together with silk), and are usually found individually within these leaf rolls. Older larvae may also attack fruit, either spinning a leaf to the fruit surface for concealment, or tunnelling further into the fruit. The larval period is rather variable between individuals at all temperatures, but on average it is about 20 days at 32°C, or 30 days at 21°C; pupation takes around 5 or 9 days respectively. A single female can lay over 400 eggs during her lifespan. Mid or late instar larvae show a limited capacity to overwinter in California, constructing shelters out of webbing, either on the plant or in dead leaves and other plant material on the ground. However, these larvae do not have a true diapause, as they appear to be partially active during this time and continue feeding at a lower rate.

*Platynota stultana* shows a limited ability to disperse naturally. Though adults can fly, it is not a migratory species and has not been recorded flying long distances. First-instar larvae actively disperse from the egg mass. While they usually crawl around the plant, they are also capable of ballooning (floating in air currents beneath strands of silk), which, depending on weather conditions, will enable them to disperse locally. However, *P. stultana* has been moved long distances in trade, presumably of plants or plant products, and has become established in several new regions as a result.

Rolled leaves are likely to be the symptom first noticed on plants, as larvae spin silk webbing on and around their food and, on leaves, roll them and spin them together with silk, hence the ‘leafroller’ part of the common name. When examined closely, feeding damage, frass (excrement) and possibly live larvae or pupae may be visible inside the leaf rolls, but these are almost identical to many native species which feed in this way. Adults are nocturnal and aren’t likely to be seen flying in the daytime unless their resting place is disturbed. Moths will come to light traps, though distinguishing them from native species could be problematic. Pheromone trapping is used in the USA and Spain.

## Economic Importance and Damage

Larvae have been recorded causing damage to a number of crops in the USA. Leaf-rolling and feeding has little apparent impact on yields of fruit crops, but attacks on flower buds can occur. Older larvae will also eat fruits, usually feeding on the surface, but they can tunnel deeper into the fruit. Damage to young fruit often heals over, leaving scarring or pitting that is mostly cosmetic. While fruit destined for processing will probably not be affected, this scarring is likely to prevent sale as table fruit. Damage to older fruit can be more serious, usually because the wounds allow the entry of secondary pathogens, with resultant rot and spoilage. Yield losses to grapes have been reported as up to 50%, with

one vineyard reporting an 80% loss one year. In oranges, as well as feeding damage to fruit, *P. stultana* also seems responsible for causing stunted fruit, which cannot be harvested and may account for as much as 10% of the total crop. Cotton yield loss has been estimated up to 25% on occasion, caused by feeding to all parts of the plant including terminal shoots and bolls. Economic damage to alfalfa late in the season has been reported, and was due to extensive webbing of the flowers preventing pollination. In Spain, much of the reported damage has been minor to date, mostly consisting of curled and rolled leaves in crops. However, pepper fruit has been attacked, though it is not known if this has caused economic losses.

## Prevention and Control

*Platynota stultana* could potentially arrive in the UK on infested tomatoes or peppers from Spain or North America. Larvae have been shown to be able to survive longer than a week in temperatures of 0-1°C, therefore it could survive chilled transport of fruit or vegetables. We recommend putting up pheromone traps in packhouses receiving host material from Spain in order to monitor for the pest.

The larvae have some protection from insecticide treatments because they can roll leaves and silk around themselves. Products containing spinosad (e.g., Conserve) and *Bacillus thuringiensis* (e.g., Dipel DF) have been recorded as being effective against this pest in the USA and are approved for some protected crops in the UK. Products containing chlorantraniliprole (Coragen) are used for the control of *Tuta absoluta* in Europe and may also be effective against *P. stultana*. The potential efficacy of the biocontrol agents that could be used against the pest in the UK is unknown. The conditions on pesticide labels should be read before application and followed.

## Advisory Information

Suspected findings of *P. stultana* or any other non-native plant pest should be reported to the relevant local authority:

For **England and Wales**, contact your local **APHA Plant Health and Seeds Inspector** or the **PHSI Headquarters**, Sand Hutton, York. Tel: 01904 405138

Email: [planthealth.info@apha.gsi.gov.uk](mailto:planthealth.info@apha.gsi.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 **DARD Plant Health Inspection Branch**:

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

For additional information on UK Plant Health please see:

<https://secure.fera.defra.gov.uk/phiw/riskRegister/>

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

<https://www.dardni.gov.uk/>

## Authors

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