

Light brown apple moth *Epiphyas postvittana*

The light brown apple moth is a defoliating insect having an extensive host range that includes many economically important plants in nursery and agriculture. Its accidental introduction into Michigan may impact a range of horticultural, ornamental and agricultural commodities.

[Michigan risk maps for exotic plant pests.](#)

Other common names

apple leafroller, Australian leafroller

Systematic position

Insecta > Lepidoptera > Tortricidae > *Epiphyas postvittana* (Walker)

Global distribution

Light brown apple moth is native to Australia. It has been introduced to the British Isles, Hawaii, New Caledonia and New Zealand. In North America, light brown apple moth was confirmed in California in 2007.

Quarantine status

This moth has been detected in nurseries and traps set in urban areas across coastal California. USDA and California authorities are working collaboratively to control and eradicate this pest.

Plant hosts

Light brown apple moth is highly polyphagous, recorded from over 70 plant families including nursery stock, cut flowers, vegetables, stone fruits (apricot, cherry, nectarine, peach and plum), pome fruits (apple and pear), grapes and citrus. Other hosts include alfalfa, beans, broccoli, cabbage, camellia, cauliflower, clover, mint, mustard, peas, potato, rose and many others.

Biology

A female moth lays clusters of eggs on upper, smooth surface of leaves (sometimes on fruit). Larvae feed on leaves, buds, shoots, flowers and fruit. Young larvae feed on the undersurface of leaves within silken shelters. Older larvae may create nests by folding or webbing leaves, buds and fruits together where they hide between feedings. Larval feeding on fruit causes irregular brown areas on the fruit surface. Pupation occurs in a cocoon within the larval nest. Two to four generations develop per year.

Identification

- **Adult:** 16-25 mm wingspan and about 10 mm long when wings are folded; forewings tan colored with



Adult. (Photo: Department of Primary Industries and Water, Tasmania Archive, Bugwood.org)



Adult. (Photo: N. Wright, Florida Department of Agriculture and Consumer Services, Bugwood.org)

irregular darker markings on the distal half; wing pattern is highly variable; hind wings grey and mottled.

- **Larva:** Up to 20 mm long; body generally yellowish-green with variations; head pale brown.
- **Pupa:** 8-11 mm long; pale to dark brown; can be found in leaves that are spun together.
- **Eggs:** About 1 mm in diameter, flat, oval, translucent and appear pale yellow to white; small, flat egg masses are found on leaves (sometimes on fruits); within a mass, eggs are overlapping giving the appearance of shingles.

Adults and other life stages of light brown apple moth may look similar to those of other tortricid moths occurring in Michigan. In addition, forewings of light brown apple moth are highly variable. A positive identification of the moth can only be performed by trained entomologists.



Larva on apple leaf.
(Photo: Department of Primary Industries and Water, Tasmania Archive, Bugwood.org)



Pupa and unknown larva. Cocoon was removed.
(Photo: Department of Primary Industries and Water, Tasmania Archive, Bugwood.org)



An egg mass.
(Photo: Department of Primary Industries and Water, Tasmania Archive, Bugwood.org)

Signs of infestation

- Presence of egg mass on upper surface of leaves.
- Presence of larvae, pupae and larval nests (folded leaves or leaves, buds and fruits webbed together).
- Superficial fruit damage; point-like holes and irregular scars on fruit surface.
- Frass and webbing on fruit surface.

Management notes

In California, eradication and quarantine measures have been implemented since the discovery of light brown apple moth in 2007. Measures include aerial spraying of synthetic pheromone products over urban and suburban areas, applications of insecticides to potentially infested nursery and agricultural crops, and pheromone trap surveys in prioritized areas such as nurseries, residential and urban landscaping, and orchards and vineyards. Quarantines and restrictions on intrastate, interstate and international shipments have been enacted in counties infested with light brown apple moth, impacting many horticultural, ornamental and agricultural industries.

Economic and environmental significance to Michigan

The moth is regarded as an economic pest of pome and stone fruits, grapes and other horticultural crops in Australia and New Zealand. These crops are also economically important in Michigan. Fruit feeding by larvae causes scars and provides sites for rot or infection. Introducing light brown apple moth into Michigan may potentially disrupt production of various agricultural, horticultural and ornamental crops, and impose restrictions on domestic and international markets. Venette et al. (2003) have forecasted that the moth can establish throughout the majority of the United States including Michigan based on climatic suitability and host availability. The moth may also feed on endangered plant species and damage the appearance of ornamental plants.



Likely pathways of entry to Michigan

Imports of live plants and agricultural commodities from Oceania.

Light brown apple moth or *Epiphyas sp.* have been intercepted at U.S. ports of entry 55 times between 1984 and 2003. The majority of the interceptions were associated with strawberry as the host (Venette et al. 2003). In California, light brown apple moth has only been detected in nurseries and by pheromone traps, indicating that pathways associated with nursery commodities may be particularly vulnerable to invasion and spread of the moth.

If you find something suspicious on a susceptible host plant, please contact MSU Diagnostic Services (517-355-4536), your county extension office, or the Michigan Department of Agriculture (1-800-292-3939).

References

- Alford, D. V. 2007. Pests of fruit crops. Academic Press, Boston.
- Anon. 2007. Light brown apple moth (LBAM). Oregon Department of Agriculture. (http://egov.oregon.gov/ODA/PLANT/IPPM/profile_lbam.shtml)
- Frankie, W. K. 2007. Light brown apple moth. University of California Cooperative Extension. ([http://cemonterey.ucdavis.edu/Agriculture/LBAM_\(Light_Brown_Apple_Moth.htm\)](http://cemonterey.ucdavis.edu/Agriculture/LBAM_(Light_Brown_Apple_Moth.htm)))
- Gilligan, T. M. and M. E. Epstein. LBAM ID: tools for diagnosing light brown apple moth and related western U.S. leaf rollers (Tortricidae: Archipini). (http://keys.lucidcentral.org/keys/v3/LBAM/Epiphyas_postvittana.htm)
- Irvin, N. 2009. Light brown apple moth. Center for Invasive Species Research, University of California Riverside. (http://cistr.ucr.edu/light_brown_apple_moth.html)
- Jackson, L. and B. Kopper (and others). 2009. 2009 light brown apple moth national survey guidelines. USDA APHIS PPQ. (http://www.aphis.usda.gov/plant_health/plant_pest_info/lba_moth/downloads/lbam-natlsurveyguidelines.pdf)
- NAPPO. 2007. Phytosanitary alert system: light brown apple moth in Alameda and Contra Costa Counties, California—United States. North America Plant Protection Organization. (<http://www.pestalert.org/oprDetail.cfm?oprID=260>)
- Passoa, S., M. Epstein, T. Gilligan, J. Brambila, M. O'Donnell. Light brown apple moth (LBAM): *Epiphyas postvittana* (Walker): screening and identification aid. (http://www.aphis.usda.gov/plant_health/plant_pest_info/lba_moth/downloads/screening_guide.pdf)
- USDA-APHIS. 2008. Questions and answers: light brown apple moth. USDA-APHIS. (http://www.aphis.usda.gov/publications/plant_health/content/printable_version/faq_lbam.pdf)
- Venette, R. C., E. E. Davis, DaCosta, Michelle, H. Heisler, and M. Larson. 2003. Mini risk assessment : light brown apple moth, *Epiphyas postvittana* (Walker) [Lepidoptera: Tortricidae]. Department of Entomology, University of Minnesota. (http://www.aphis.usda.gov/plant_health/plant_pest_info/pest_detection/downloads/prae/postvittana.pdf)