

Light Brown Apple Moth and Related Species in California

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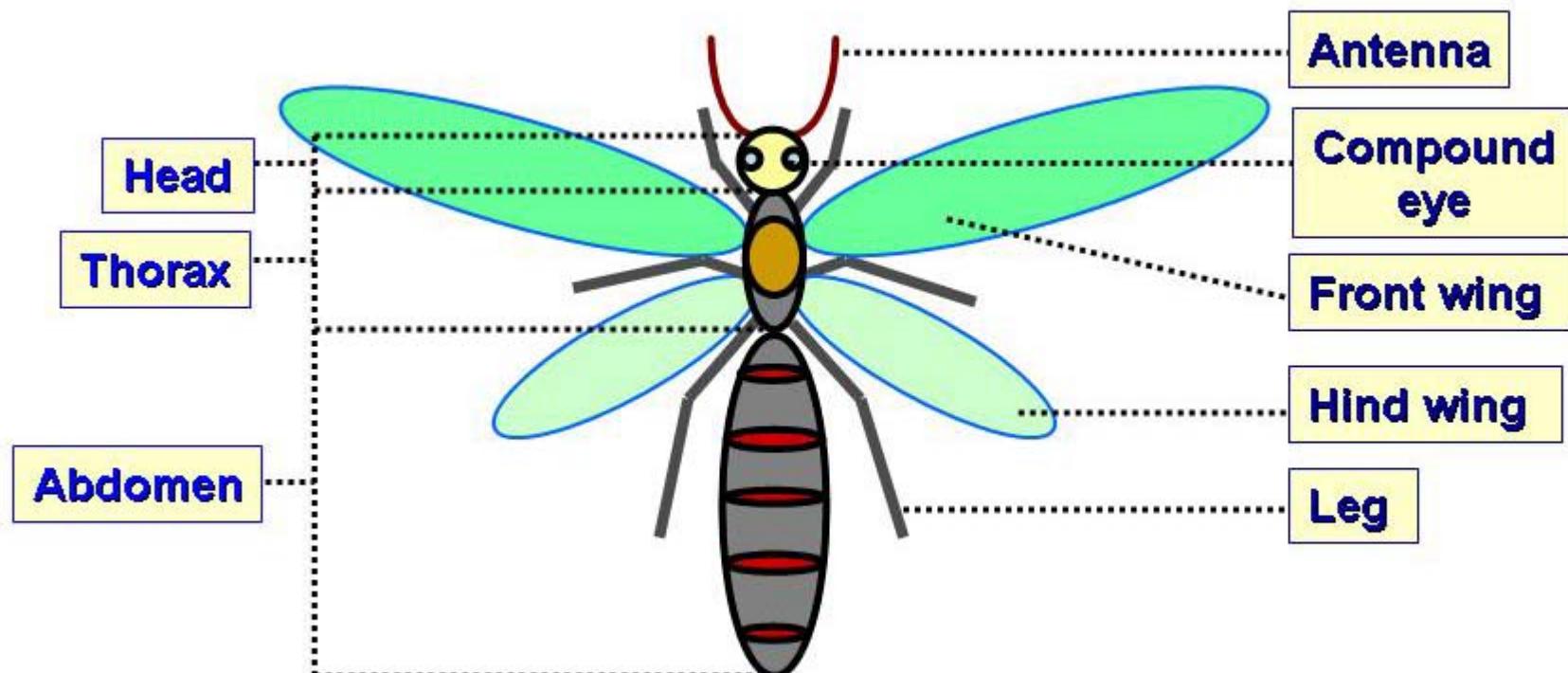
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Monterey County**



Characteristics of Insects

- Animals with jointed legs (Arthropods)
- Exoskeleton and bilateral body
- 3 body regions (head, thorax, and abdomen)
- 3 pairs of legs and 0 - 2 pairs of wings



Order: Lepidoptera

Butterflies and Moths

- The insect has stages of egg, larva, pupa, and adult
- Adults have 2 pairs of membranous wings
- Body, wings, and legs are usually with scales
- Eggs are laid on hosts and larvae feed on leaves, stems, and flowers



Scaly Wing of Imperial Moth

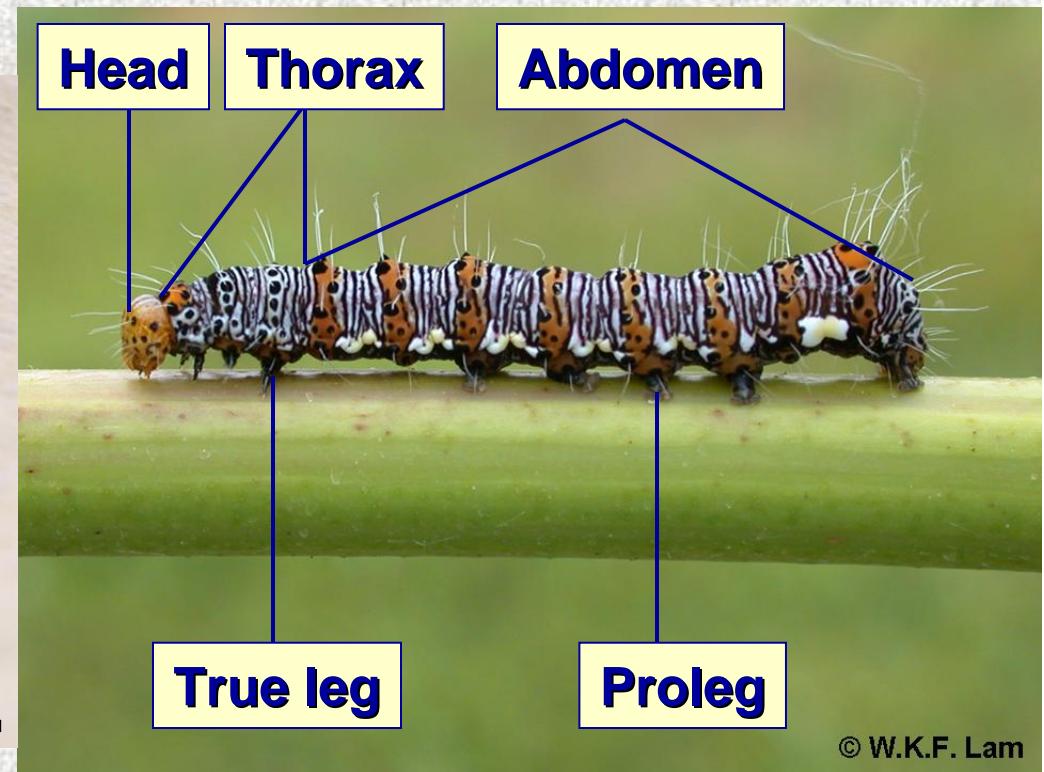


Scales

- Mouthparts of adults are developed into a long, coiled structure for sucking (proboscis) and feed on nectar
- Larvae (caterpillars or worms) have true legs and prolegs
- Larvae usually pupate on the hosts or in the soil



Proboscis of Hawkmoth



Eightspotted Forester Larva

Family: Tortricidae

- Adults have a 0.25-1.25 inch wingspan
- Adults are usually gray, tan, or brown
- Antennae are usually threadlike (filiform)
- Wings have dark bands or mottled areas, and occasionally with metallic spots
- Front wings are usually rather square-tipped

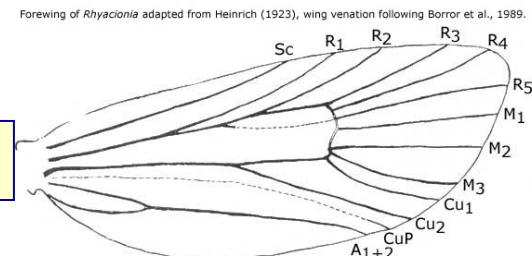


Light Brown Apple Moth

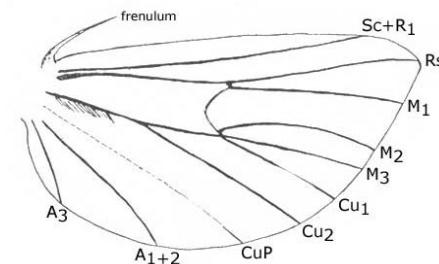
Leafrollers

Front wing

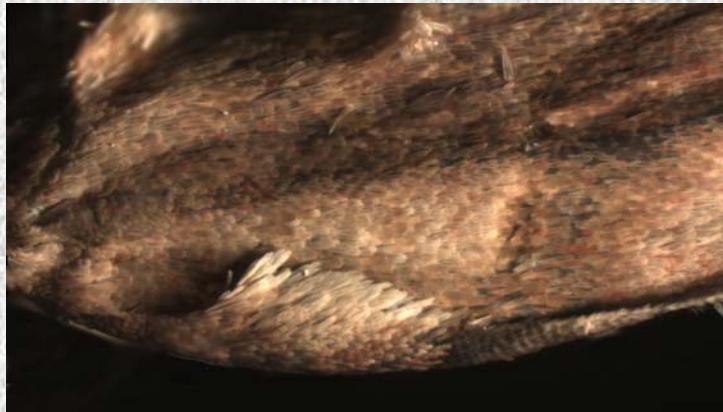
Hind wing



Hindwing of *Olethreutes* adapted from Heinrich (1923), wing venation following Borror et al., 1989.

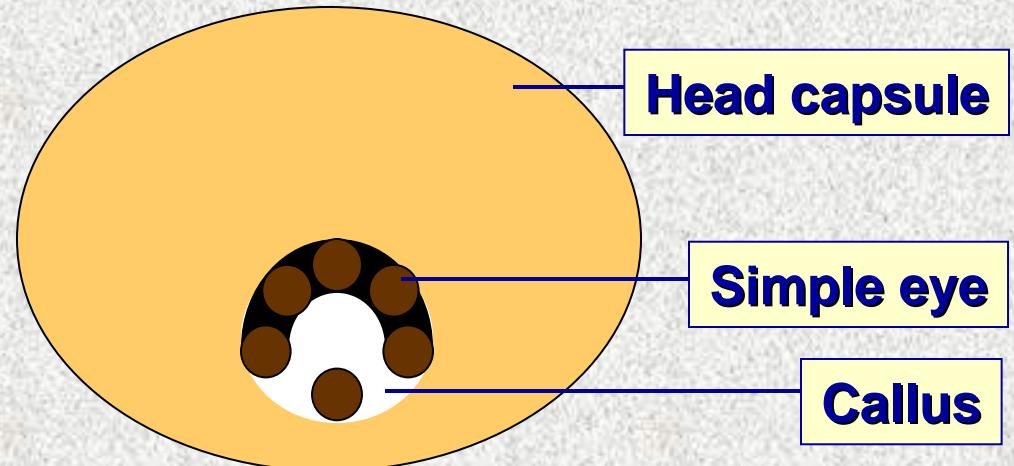


- Front wings of some male moths have costal folds with scales or hairs
- Larvae with 6 simple eyes (stemma) on each side of the head capsule
 - 5 simple eyes are linked by a black arc that encloses a white callus
 - The 6th simple eye is located alone below the callus



Costal Fold of
Light Brown Apple Moth

Photo by Marc Epstein and Megan O'Donnell, CDFA



- Hardened plate (prothoracic shield) at the back of the head
- Anal comb located at the end of larval abdomen
- Larvae usually roll the leaf or leaves and fruit together with webbing and feed inside (hence, leafrollers)
- Larvae wriggle vigorously backwards and drop to the ground when disturbed



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Anal Comb of Oriental Fruit Moth



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Orange Tortrix



- **Obtect pupae: Wings and appendages of the pupae are appressed to (pressed against) the body and most of the abdominal segments are immovable**
- **Shinglelike egg masses are laid on upper surface of leaves**



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**Obtect Pupa of
Fruittree Leafroller**



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**Shinglelike Egg Mass of
Omnivorous Leafroller**



Light Brown Apple Moth, *Epiphyas postvittana*

- Native to Australia and has 3 - 4 generations per year, depending on the latitude
- Introduced to Tasmania, New Zealand, England, New Calendonia, and Hawaii
- *Very similar in size and appearance to other leafroller species in California*
- Have a wingspan of 0.67 inch in male and 1 inch in female moths



Female

Male

- Light brown moths with varying amounts of dark brown areas on front wings
- Extremely variable species with different wing patterns between males and females and among individuals
- Male moth with costal folds on front wings



2 Male Light Brown Apple Moths (Scale = 0.15 inch)

Photo by Scott Kinnee and Marc Epstein, CDFA

- Fully grown larvae are pale green (common in leafrollers)
 - Male larvae are about 0.33 inch long
 - Female larvae are about 0.67 inch long
- Larvae with 6 simple eyes
- Prothoracic shield at the back of the head
- Anal comb at the end of larval abdomen
- Obtect pupa
- Shinglelike egg mass



Light Brown Apple Moth Larva
Photo by Marc Epstein and Megan O'Donnell, CDFA

Other Leafroller Moths in California

Apple Pandemis, *Pandemis pyrusana*

- 2 - 3 generations per year
- Larvae are greenish yellow with straw-colored head
- Adults are light brown to rusty color with bands on the front wings
- UC IPM Guidelines: Apple and caneberries

<http://www.ipm.ucdavis.edu>



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Codling Moth, *Cydia pomonella*

- **2 - 4 generations per year**
- **White caterpillars with black or brown heads**
- **About 0.5 to 0.75 inch long when fully grown**
- **Pupate in soil or in bark crevices**



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- Adults are mottled gray moth about 0.5 to 0.75 inch long
- Tiny disc-shaped eggs are laid singly on leaves, fruits, and nuts
- UC IPM Guidelines: Gardens and landscape, apple, pear, plum, prune, and walnut



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Fruitree Leafroller, *Archips argyrospila*

- 1 generation per year
- Larvae wriggle vigorously when disturbed and hang on the plant or drop to the ground with a silken thread



- **Larvae roll leaves together with silken thread and feed inside the nests**
- **Green larva with dark brown head and a tan plate behind the head**
- **Mature larvae pupate inside the nests**



- Adults are bell-shaped moth with dark brown bands about 0.6 to 0.8 inch long
- Egg masses are laid on twigs
- UC IPM Guidelines: Gardens and landscape, almond, apple, apricot, cherry, citrus, nectarine, peach, pear, plum, and prune



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Garden Tortrix, *Ptycholoma peritana*

- 2 - 4 generations per year
- Larvae are light green with light brown heads about 0.5 inch long when mature
- Moths are light brown and bell-shaped about 0.25 inch long
- Front wing has a marginal spot and a dark diagonal stripe
- UC IPM Guidelines: Strawberries



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Obliquebanded Leafroller, *Choristoneura rosaceana*

- 2 - 3 generations per year
- Greenish yellow larvae with dark heads
- 2nd or 3rd larval stages overwinter in a silken case
- Adults are reddish brown moths with dark-brown, oblique bands on wings
- UC IPM Guidelines: Almond, apple, apricot, cherry, nectarine, peach, pear, pistachio, plum, and prune



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Omnivorous Leafroller, *Platynota stultana*

- **Greenish brown larvae with brown heads**
- **Mature larvae have white knoblike or round structure (tubercles) with hair (seta) protruding on the top of abdomen**



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- Adults are dark brown moths with rusty tan color on the tips of front wings
- Adults are about 0.4 inch long
- Shinglelike egg masses are laid on leaves
- UC IPM Guidelines: Apple, citrus, cotton, grape, nectarine, peach, pear, pepper, and plum

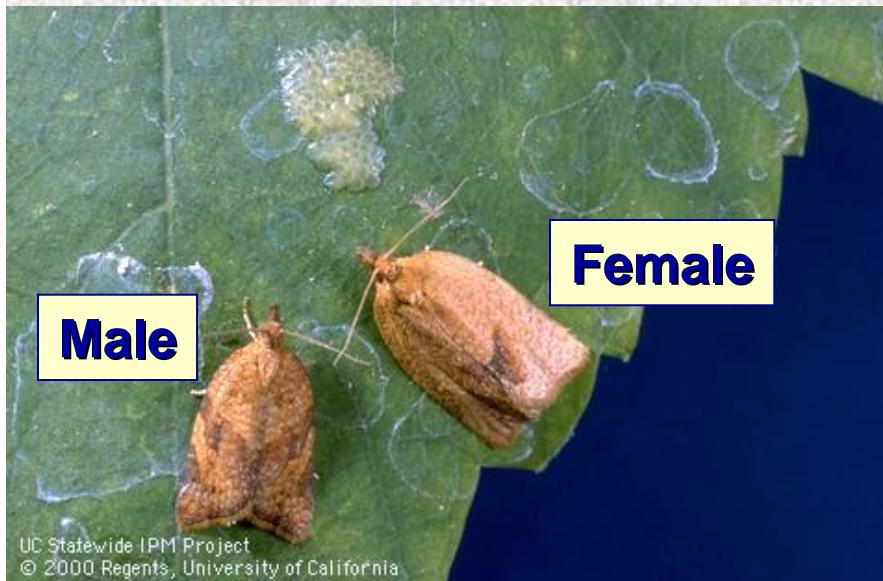


Orange Tortrix, *Argyrotaenia franciscana*

- 3 generations per year
- Green or straw-colored larvae with brown heads
- Prothoracic shield is located behind the head on the thorax
- Mature larvae are about 0.5 inch long
- Larvae wriggle sideways or backwards when disturbed



- Adults are orange brown bell-shaped moths about 0.5 inch long
- A fainted V-shaped marking is usually located on the front wings when at rest
- Shinglelike egg masses are laid on leaves
- UC IPM Guidelines: Apple, apricot, avocado, cherry, citrus, grape, pear, pepper, plum, and prune



Oriental Fruit Moth, *Grapholita molesta*

- 5 - 6 generations per year
- White larvae with black heads when hatched; turn pink with brown heads when mature
- Mature larvae are about 0.5 inch long
- Anal comb at the end of the larval abdomen



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- **Larvae feed on shoot terminals and fruits**
- **Larvae pupate on shoots or fruits**
- **Adult oriental fruit moths are grayish moths about 0.4 inch long**
- **UC IPM Guidelines: Almond, nectarine, and peach**



Western Avocado Leafroller (*Amorbia*), *Amorbia cuneana*

- 2 - 3 generations per year
- Primarily pest on avocado and occasionally on citrus
- 2 horizontal lines on each side of the head and on the shield behind the head
- Prothoracic shield is located behind the head on the thorax
- Mature larvae are about 0.75 inch long



- Larvae roll the leaves or tie leaves to fruit
- Larvae pupate on leaves inside the nests
- Orange to tan moths with dark markings on front wings
- Adults are about 1 inch long
- UC IPM Guidelines: Avocado and citrus



Male



Family: Dioptidae

Oakworms

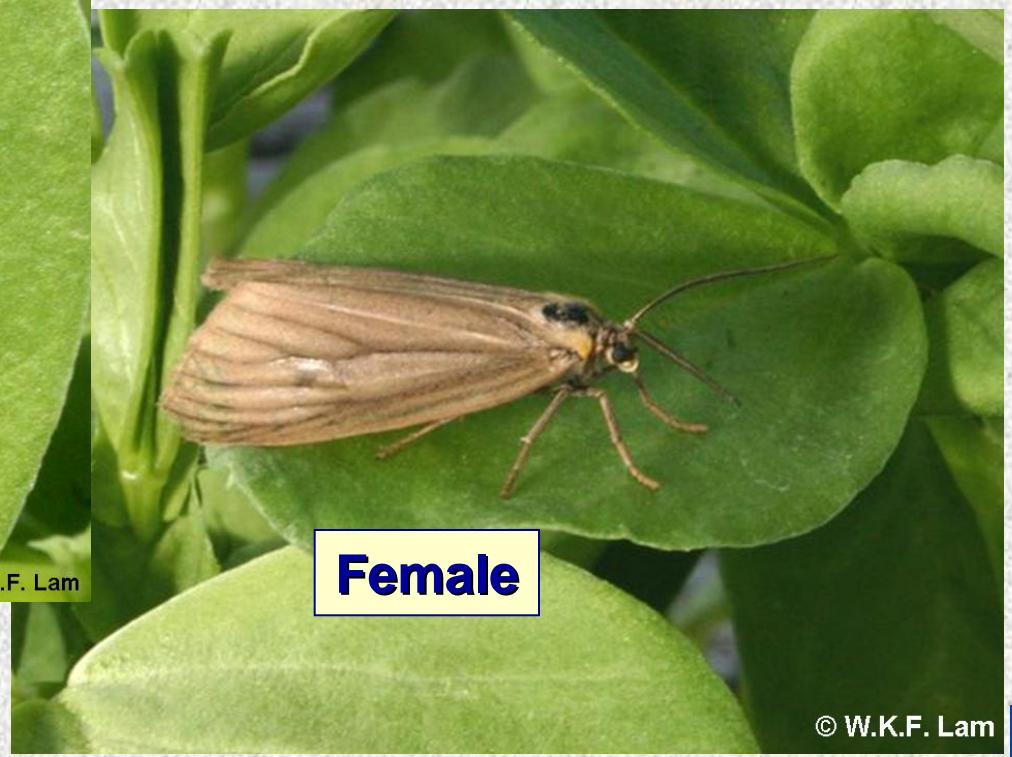
California Oakworm, *Phryganidea californica*

- 2 - 3 generations per year
- Larvae are variable in color, but commonly are dark with prominent yellow or olive stripes
- Larvae are about 1 inch long when fully grown



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- Adults are tan to gray moth with characteristics wing veins and about 0.75 inch long
- Antennae of male moths are large and branched on 2 sides (bipectinate) when compared with those of the females



- Pupae are pale yellow with black lines and dots
- Tiny, white eggs are laid in groups on leaves and twigs
- UC IPM Guidelines: Gardens and Landscape

