

# Strawberry Leafroller *Ancylis comptana* (Frölich) (Insecta: Lepidoptera: Tortricidae)<sup>1</sup>

Justin Renkema<sup>2</sup>

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## Introduction

Strawberry leafroller, *Ancylis comptana* (Frölich), is a reddish brown tortricid moth with distinct gray, tan and white forewing markings. It is considered a minor or occasional pest of strawberry in many areas of North America and Europe because of leaf tissue damage. Larvae use silk to spin webs and roll leaves while consuming leaf tissue.

## Synonymy

*Ancylis comptana* (Frölich)—after Fink (1932)

*Tortrix comptana* Frölich (1828)

*Phoxopteryx comptana* Duponchel (1844)

*Anchylopera comptana* Wilkinson (1859)

*Grapholitha (Phoxopteryx) comptana* Heinemann (1863)

*Grapholitha conflexana* Walker (1863)

*Anchylopera fragariae* Walsh and Riley (1869)

*Ancylis comptana* Fernald (1903)

## Distribution

Strawberry leafroller is found in eastern North America, occurring west to Illinois, Iowa, Oklahoma and Texas. It is also recorded from California, Colorado, Nevada, Alaska, the Pacific Northwest and several Canadian provinces. Strawberry leafroller was first observed in North America in Indiana in 1868 and was thought to have been introduced from Europe, but may have been originally distributed in both North America and Europe. Strawberry leafroller is found in most European countries and has been recorded in Mongolia and Korea.

## Description

### Adults

Adult moths have a wingspan of 10–13 mm. Forewings are light to dark reddish brown, with lighter tan and white areas streaked with darker brown, particularly on distal ends. Hindwings are gray.

### Eggs

The eggs are oval and attached to the leaf surface. The eggs change from pale green to yellow as they develop.

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2. Justin Renkema, UF/IFAS Gulf Coast Research and Education Center, Wimauma, FL 33598.



Figure 1. Strawberry leafroller adult, *Ancyliis comptana* (Frölich) (dorsal view).

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## Larvae

The larvae progress through five instars, increasing from 1.5 to 12 mm in length. Prepupae grow larger before overwintering than prepupae of summer generations, in preparation for hibernation. For early instars, the head is brown and the body is pale green, but in later instars the head is a yellowish brown and the body is gray-brown, with a gray underside.



Figure 2. Strawberry leafroller larva, *Ancyliis comptana* (Frölich) (dorsal view).

Credits: Justin Renkema, UF/IFAS

## Pupae

The pupae are 8.5 mm in length and change from yellowish to dark brown over time.

## Life Cycle and Biology

Strawberry leafroller has two or three annual generations, depending on latitude, with moths active in early spring, summer, and late summer if a third generation occurs. The number and timing of generations has not been described for sub-tropical regions, such as Florida. In temperate locations, overwintering larvae form pupae from which the first generation of moths emerge and lay eggs. Moths live for about two weeks, longer in cooler weather, dispersing locally onto suitable host plants.

Eggs are laid singly on the undersides of leaves; a female lays 20–120 eggs in her lifetime. After an incubation period of 5–17 days, first instars feed on leaf tissue and spin a silky covering near the base of the leaf between two prominent veins. The covering is enlarged as larvae grow, and larvae may move and start building a second covering on the same leaf. Eventually, larvae migrate to the tops of leaves and begin to fold and roll them together.

Pupae are formed within the leaf roll. The average duration of the entire larval period is 24 days and the pupal period is 6–18 days. Temperatures between 18 and 30°C (64–86°F) are optimal for larval development. Adult emergence is reduced to about 30% when temperatures are consistently below 14°C (57°F) or over 34°C (97°F).

Overwintering larvae undergo diapause (a state of hibernation), induced by shorter day length and lower temperature in early fall. Diapause is complete in about 3 months, and post-diapause development is directly related to temperature, requiring 154 accumulated degree-days over 10.5°C (51°F). Diapause in Florida populations has not been confirmed.

## Host Plants

Strawberry leafroller is found primarily on plants in the rose family (Rosaceae), including cultivated strawberry (*Fragaria* spp.) and blackberry and raspberry (*Rubus* spp.), as well as cinquefoil (*Potentilla* spp.), roses (*Rosa* spp.) and *Dryas octopetala*. It has also been recorded on small burnet (*Sanguisorba minor*) and thyme (*Thymus* spp.).

## Economic Importance

In the late 1800s and early 1900s, losses of up to 50% in strawberry yields in midwestern and eastern states were reported. Most of the loss was due to the early-season feeding by first generation larvae. However, strawberries have a relatively high tolerance for strawberry leafroller feeding, with no differences in larval development or ovipositional preference between more recently developed cultivars (1990s). Economic impacts of strawberry leafroller on raspberries and blackberries have not been reported.

## Damage

Damage caused by strawberry leafroller is confined to plant leaves; however, under heavy infestations fruit can become small and distorted due to severely affected plants. Larvae feed on and fold or roll leaves, causing shriveling and withering so that fields appear scorched or burnt when populations are high.



Figure 3. Feeding and leafrolling damage on cultivated blackberry (*Rubus* subgenus *Rubus*) due to strawberry leafroller moth, *Ancylis comptana* (Frölich).

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Figure 4. Feeding and leafrolling damage on cultivated blackberry (*Rubus* subgenus *Rubus*) due to strawberry leafroller moth, *Ancylis comptana* (Frölich).

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## Management

Low levels of strawberry leafroller infestation (about 10–20% of leaves infested) can be sustained by strawberries without causing economic losses and populations rarely reach high densities, therefore control is not often warranted.

## Biological Control

A suite of parasitoids have been recorded from strawberry leafroller larvae and pupae and contribute to keeping populations low. Some important species are *Itopectis conquisitor*, *Pediobus facialis*, *Macrocentrus ancilovorus* and *Cremastes cookii*. A fly, *Exorista pyste*, also parasitizes larvae, and predators that have been observed feeding on larvae include the bugs *Nabis americanoferus* and *Podisus maculiventris* (Hemiptera). In addition, strawberry leafroller has been shown to be a key alternative host for the parasitoid *Colpoclypeus florus* of dominant leafroller pest species (Tortricidae) in Washington state fruit orchards when *Rosa woodsii* or strawberries are close to orchards.

## Cultural Control

Where strawberry leafroller is a chronic problem, it is advisable to remove accumulated dead plant material where larvae may overwinter, and if feasible, to remove leaves that show signs of damage. Pinching to kill larvae in rolled leaves also may be an option.

## Chemical Control

A decision to apply insecticides should be based on scouting for damage or results of temperature models used to predict occurrence of egg hatch in the spring. First instars do not roll leaves, so are difficult to observe.

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