UF IFAS Extension UNIVERSITY of FLORIDA

EENY582

Erythrina leafminer (suggested common name); *Leucoptera erythrinella* Busck, 1900 (Insecta: Lepidoptera: Lyonetiidae)[1]

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Introduction

The erythrina leafminer is a member of the genus *Leucoptera*, which are leaf borers that can cause severe damage to plant crops, such as coffee or apples. Even though these moths are 1/20 to 1/10 the size of an average moth, they can cause serious damage.

Figure 1. Damage to the coral bean plant (*Erythrina herbacea*) by erythrina leafminer (*Leucoptera erythrinella*).
Credits: Andrei Sourakov, University of Florida

Leucoptera erythrinella is a pest of the coral bean (*Erythrina herbacea*) and other members of the genus *Erythrina* (Fabaceae). Unlike the other two erythrina moth species that are found in Florida (erythrina leafroller and erythrina borer), the larvae of *Leucoptera erythrinella* feed inside the leaves, making elaborate and characteristic mines, which from a distance appear to be discolorations of the leaf itself.

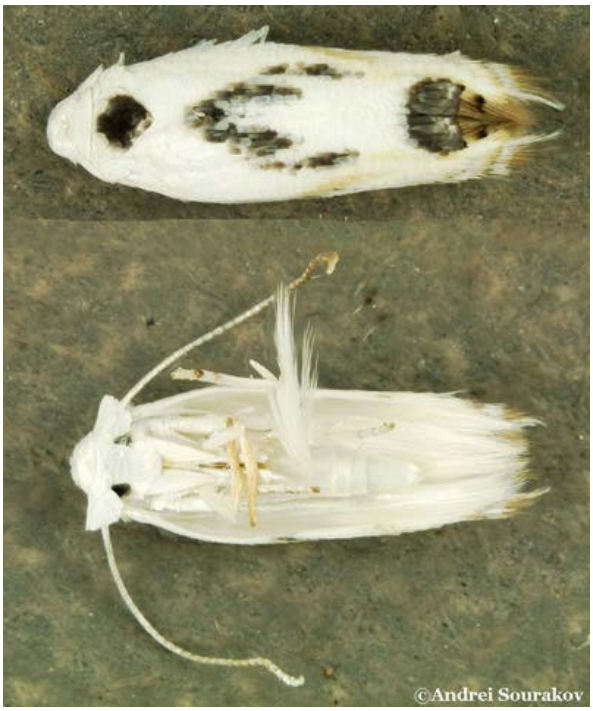

Figure 2. Upper and underside of erythrina leafminer (*Leucoptera erythrinella*) female.
Credits: Andrei Sourakov, University of Florida; Paul Skelley, Florida Department of Agriculture and Consumer Services, Division of Plant Industry

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Leucoptera erythrinella appears only sporadically throughout its habitat, but when it infests a plant, the majority of the plant's leaves are affected. Perhaps this is due to the fact that these tiny (approximately 3 mm in body length) moths have a slow, hovering, usually vertical flight, which limits their dispersal abilities.

This leafminer temporally partitions resources with the other two erythrina moth species. In north Central Florida, it seems to mostly infest plants later in the season (August–November), when infestations by the erythrina leafroller and stem borer begin to decline.

Distribution

The moth is mostly recorded in Florida, but the distribution probably includes adjacent states.

Description

Eggs

Eggs of *Leucoptera erythrinella* are very small (approximately 200 µm), translucent to the point of transparency when laid, and appear to the naked eye as tiny dust particles on the leaf surface. The micropyle of the dome-shaped egg is located dorsolaterally. The egg is covered with a reticulated hexagonal structure that can be observed using Scanning Electron Microscopy.

Figure 3. Egg of the erythrina leafminer (*Leucoptera erythrinella*).
Credits: Andrei Sourakov, University of Florida, and Paul Skelley, Florida Department of Agriculture and Consumer Services, Division of Plant Industry

Larvae

Larvae hatch from eggs laid on the undersides of leaves of *Erythrina herbacea* and begin feeding. The mine begins on the upper side of the leaf as a short serpentine track, but soon broadens out into a large irregular blotch, often obliterating the early part of the mine. Larvae that come to the leaf surface to pupate move like fly maggots (see below).

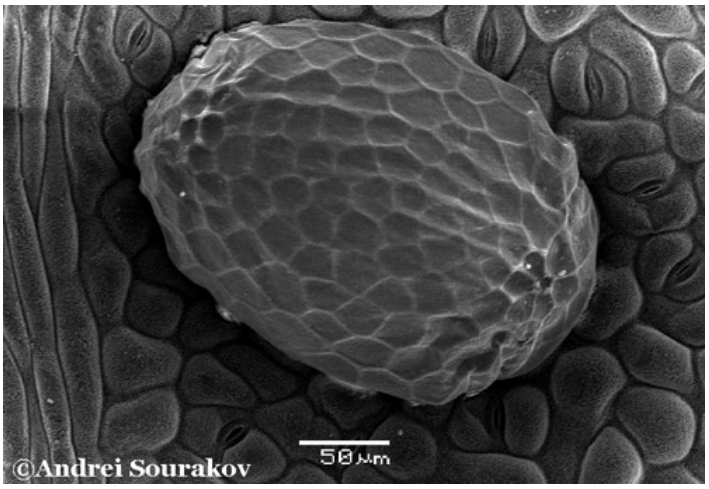

Figure 4. Scanning Electron Micrograph of the egg of the erythrina leafminer (*Leucoptera erythrinella*).
Credits: Andrei Sourakov, University of Florida, and Paul Skelley, Florida Department of Agriculture and Consumer Services, Division of Plant Industry

Figure 5. Motion of the mature larva of erythrina leafminer (*Leucoptera erythrinella*) emerged from the leaf of the coral bean plant (*Erythrina herbacea*) prior to pupation.
Credits: Andrei Sourakov, University of Florida

Pupa

The pupa is cream-white and is located inside a "hammock" which Busck described as "being placed on the outside of the mine on the leaf in a glistening white oblong cocoon spun under an equally showy white bridgework of longitudinal silken bands". Shown in Figures 7 and 8 as parallel silken strands.

Pupation can occur on the same leaf as the mine, as Busck indicated, but more often cocoons are found on another leaf away from the mine.

Figure 6. Mines of the erythrina leafminer (*Leucoptera erythrinella*) in the leaf of the coral bean plant (*Erythrina herbacea*).
Credits: Andrei Sourakov, University of Florida

Figure 7. Larva of erythrina leafminer (*Leucoptera erythrinella*) spinning a cocoon.
Credits: Andrei Sourakov, University of Florida

Figure 8. Cocoon of erythrina leafminer (*Leucoptera erythrinella*).
Credits: Andrei Sourakov, University of Florida

Figure 9. Pupa (removed from cocoon) of erythrina leafminer (Leucoptera erythrinella) next to a pin head.
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Adults

The moths are sexually dimorphic. Though both sexes are mostly white, the females bear a dorsal rhombus-shaped thoracic mark and a V-shaped mark resulting from dark streaks in the midsection of the forewing. Males have only small marginal brown markings on their forewings and black valvae (sclerotized parts of genitalia). Both sexes have black eyes, which are hidden under an eye-cap made of white scales.

Figure 10. Freshly emerged female of erythrina leafminer (*Leucoptera erythrinella*).
Credits: Andrei Sourakov, University of Florida

Figure 11. Male of erythrina leafminer (*Leucoptera erythrinella*).
Credits: Andrei Sourakov, University of Florida

Hosts

Leucoptera erythrinella feeds on the coral bean, *Erythrina herbacea*, and other members of the genus *Erythrina*. Coral bean flowers are a popular nectar source for hummingbirds and butterflies. The plant contains alkaloids, which make its fruit and leaves toxic. Native Americans used the ground seeds as rat and fish poison. One should note that the stems have spines. The plant can be easily propagated from the roots. Mechanical or chemical damage to the hard outer layer of the seeds is needed in order for them to sprout. The plant is drought-tolerant and grows well in sandy soils and in partially sunny areas.

In the USA, *Erythrina herbacea* is distributed in the coastal South Carolina, Georgia, and states surrounding the Gulf of Mexico. In north Florida, this shrubby plant dies back in the winter, comes up from the roots in March, and blooms from April to June. In more tropical climates, it can form small trees.

Other species of *Erythrina* (of which there are over 100) can grow into large trees, but they are rarely freeze-tolerant and are naturally found only in tropical climates throughout the world. However, many nurseries in the USA offer cockspur coral tree (*Erythrina crista-galli*), which, once established, can grow into a large (15–20 ft) tree and tolerates freezing to 15–20°F.

Figure 12. An inflorescence of the coral bean plant (*Erythrina herbacea*).
Credits: Andrei Sourakov, University of Florida

Economic Importance

The moth's host plants in the genus *Erythrina* are favored as ornamentals for their beautiful flowers. They also have medicinal uses, which vary depending on local traditions. The damage that moths inflict may affect marketability of the plant stock at nurseries.

Figure 13. Dry seeds of the coral bean plant (*Erythrina herbacea*).
Credits: Andrei Sourakov, University of Florida

Damage

Damage occurs to the foliage and looks like a squiggly line on the leaf, which is characteristic of leaf miners. The single larva only affects one leaf, but usually, when infested, the plant suffers heavy damage from numerous larvae. The effect of the pest on the plant's survival is unknown.

Figure 14. A leaf of the coral bean plant (*Erythrina herbacea*) infested by the erythrina leafminer (*Leucoptera erythrinella*).
Credits: Andrei Sourakov, University of Florida

Figure 15. A hybrid between cockspur coral tree (*Erythrina crista-galli*) and coral bean (*Erythrina herbacea*) purchased from a nursery and infested by the erythrina leafminer (*Leucoptera erythrinella*) in north Florida.
Credits: Andrei Sourakov, University of Florida

Selected References

Busck A. 1879. New species of moths of the superfamily Teneina from Florida by August Busck. Pamphlets in biology, Kofoid collection 3049. pp. 239.

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