



# *Tuta absoluta*

The tomato leafminer

## IDENTIFICATION AID

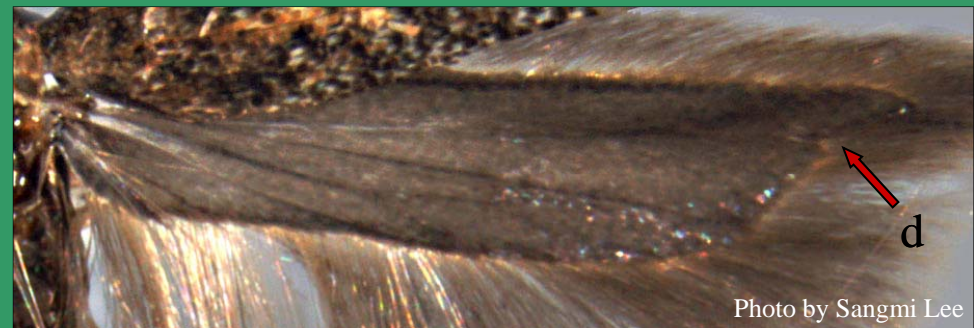
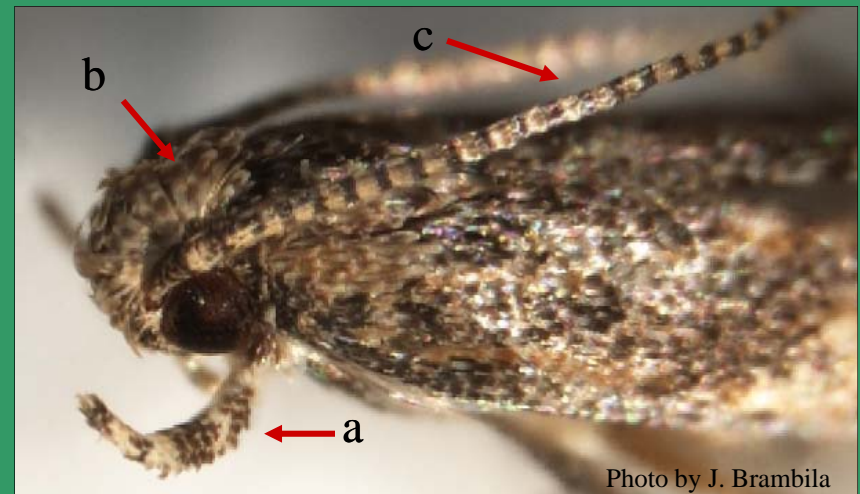


The tomato leafminer, also known as the South American tomato leafminer, belongs in the family Gelechiidae. The following are some external characters diagnostic of the Gelechiidae and are illustrated at right by *Tuta absoluta*:

- a) labial palpi prominent, projected forward, up-curved, and with the apical segment long and acute;
- b) head vertex covered with appressed scales (scales flattened and against the surface);
- c) antennae filiform;
- d) hindwings with outer margin concave posterior of apex.

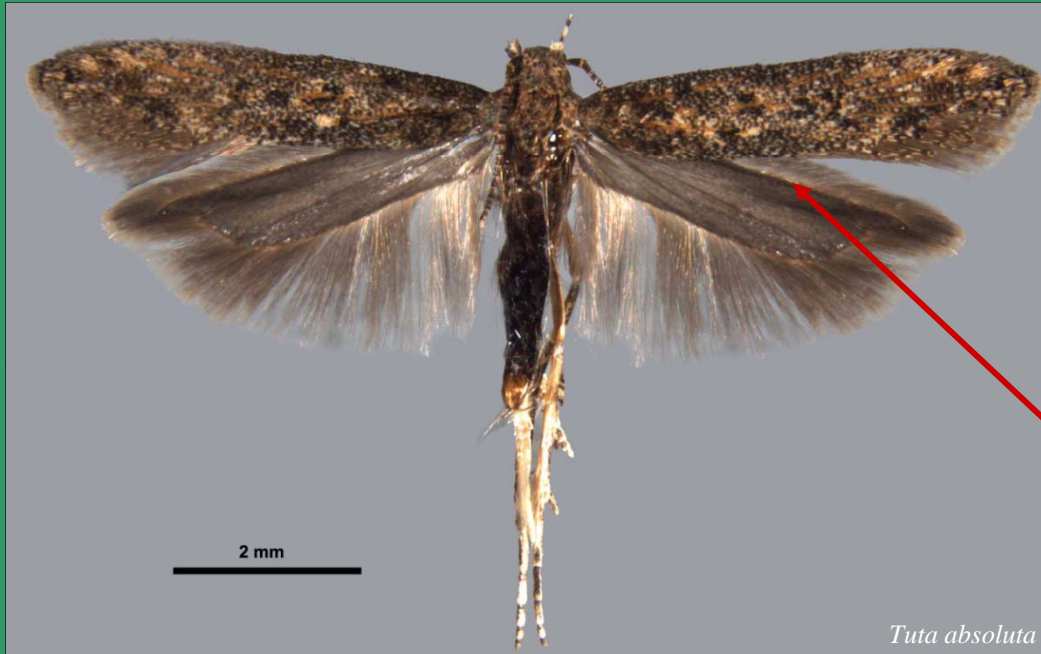
Gelechiidae lack chaetosemata, a patch of bristle-like setae above each compound eye.

**If a suspect specimen has chaetosemata or differs from all four characters listed above, it is not a gelechiid moth and it is not the tomato leafminer. For final identification, it is necessary to carefully examine genitalic structures.**



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## The tomato leafminer



Wing span ~7/16 to 1/2 inch (10 to 14 mm) and body ~3/16 in (4.5 mm)

The most important external part to examine is the anterior margin of the hind wing. It lacks hair pencils, which are bundles of long stiff setae. To see this character, the anterior wing must be lifted slightly, which can be accomplished even on some specimens on sticky boards

The tomato leafminer can be distinguished by the following characteristics:

- antennae long, thin, and banded with gray and dark brown;
- labial palpi long, up-curved, and banded in color;
- forewings 4.5 to 4.7 mm in length, narrow, with apex fringed, and speckled with brown, silvery gray and black patches;
- hindwings narrow, margins fringed with long hairs, and silvery gray in color.

**For final identification it is necessary to carefully examine adult male genitalic structures.**

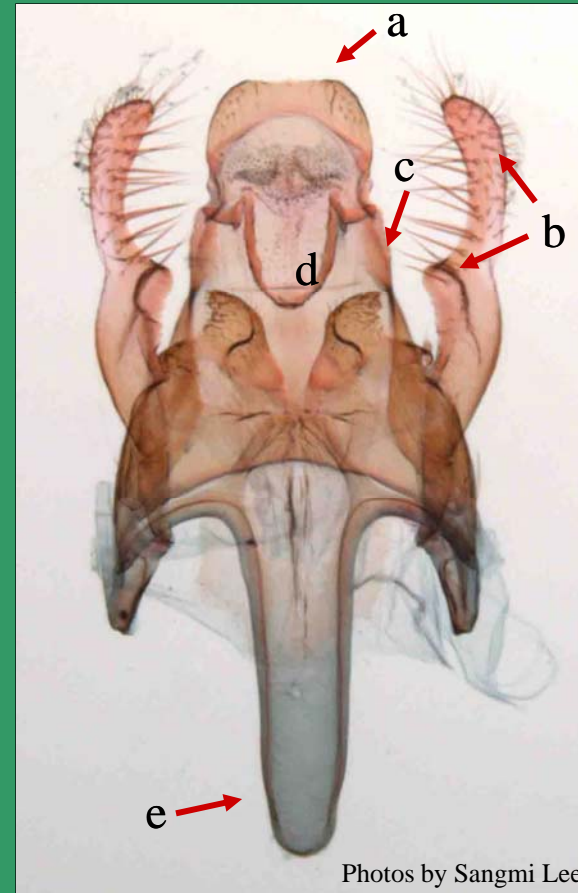
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## The tomato leafminer

Suspect gelechiids from sticky traps should be cleaned with warm HistoClear-II (a mix of refined paraffin oil with orange oil), or a similar compound. Then, the abdomen should be removed and either macerated with 10% potassium hydroxide (KOH) or, if soft, it could be gently pressed so that the genitalia are extruded. The scales should be removed from the valvae by gently brushing them.

Male *Tuta* (= *Phthorimaea*) *absoluta* (Meyrick) can be distinguished from other gelechiids by the following characters:

- a) uncus hood-shaped, broad at apex;
- b) valvae digitate and setose apically, inner margin convex medially (this is the best diagnostic character for male *Tuta absoluta*);
- c) tegumen broadened basally;
- d) gnathos broad, with a rounded tip;
- e) vinculum broad and well developed, with a long and broad saccus;
- f) phallus with a prominent caecum.



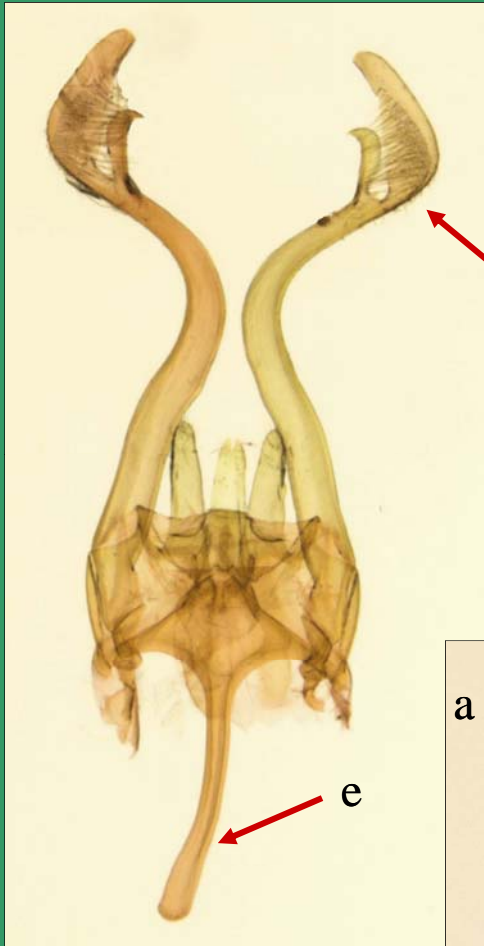
**Questionable specimens should be sent forward for identification.**



# *Keiferia lycopersicella*

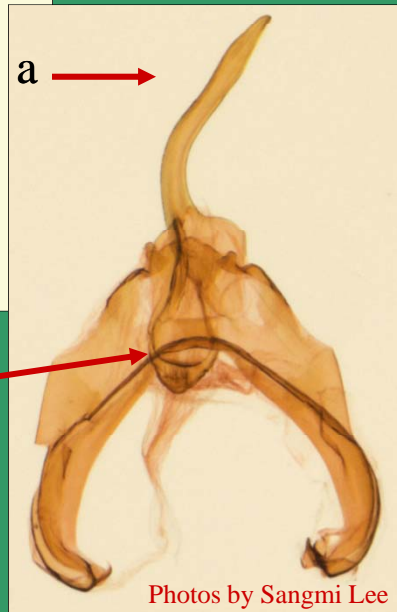
## The tomato pinworm

One of the gelechiid species that may be collected during surveys for the tomato leafminer is *Keiferia lycopersicella* (Walsingham), the tomato pinworm. The male genitalia are very different from each other in these two species and are useful in their identification.



Male tomato pinworm specimens can be distinguished from other gelechiids, and differ from male *Tuta absoluta*, by these characters:

- a) uncus long, narrow, and curved;
- b) valvae long, slender, sinuate, with apical area enlarged and forked (this is the best character to distinguish male *Keiferia lycopersicella*);
- c) tegumen narrow and curved medially;
- d) gnathos oval, elongated;
- e) vinculum with a long, slender saccus;
- f) phallus elongate, slender, and with a globular base.

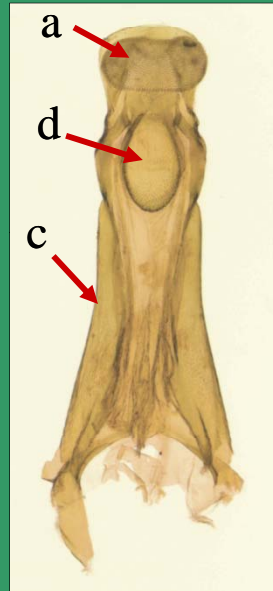


Photos by Sangmi Lee

# *Phthorimaea operculella*

## The potato tuber moth

Photos by Sangmi Lee



Another gelechiid that is likely to be collected during trapping for the tomato leafminer is *Phthorimaea operculella* (Zeller), the potato tuberworm or tuber moth. The genitalia of this species differ from the genitalia of *Tuta absoluta* and *Keiferia lycopersicella* most clearly by the following characters:

- a) uncus broad, round;
- b) valvae slender with apex curved (this is the best character to distinguish *Phthorimaea operculella*);
- c) tegumen long, narrow;
- d) gnathos oval, tongue-shaped;
- e) vinculum well developed, broad;
- f) phallus long, slender, curved, widest at the base.

This identification aid was produced by Julieta Brambila (USDA/APHIS/PPQ), Dr. Sangmi Lee (Mississippi Entomological Museum, Mississippi State University), and Dr. Steve Passoa (USDA/APHIS/PPQ) for CAPS (Cooperative Agriculture Pest Survey program). Special appreciation is directed to Marja van der Straten (Plant Protection Service, Netherlands) for *Tuta absoluta* specimens and background information and Beverly Pope (FDACS) for library services support. All genitalia photos were taken by Sangmi Lee.