

Gymnandrosoma aurantianum

Citrus Fruit Borer



IDENTIFICATION AID

This identification aid illustrates *Gymnandrosoma aurantianum* Lima (Tortricidae: Olethreutinae), also known as the citrus fruit borer, as well as the most common non-target tortricid species caught in traps with the pheromone for *G. aurantianum*.

This resource was produced by Julieta Brambila (USDA/APHIS/PPQ) for CAPS (the Cooperative Agriculture Pest Survey program). Special appreciation is directed to James E. Hayden (Division of Plant Industry, Florida Department of Agriculture and Consumer Services) and Deborah Matthews (McGuire Center for Lepidoptera and Biodiversity) for lending reference pinned and dissected specimens and for sharing photographs. Background on the diagnosis of the citrus fruit borer and non-target tortricids is based primarily on the works by David Adamski (research associate at the National Museum of Natural History), John Brown (USDA-Systematic Entomology Laboratory, retired), Todd Gilligan (USDA-APHIS-PPQ National Policy Manager), and Marc Epstein (California Department of Food and Agriculture). Final identification of *Ecdytolopha mana* came from Todd Gilligan and Jim Hayden. Ariana Gaskin (FDACS-DPI, CAPS program) was involved in sample processing (target screening, specimen cleaning, dissection and identification). Identification for *Cydia erotella* came from Sara Furgeson (FDACS-DPI, CAPS program).

Primary references:

David Adamski and John W. Brown. 2001. Systematic revision of the *Ecdytolopha* group of genera (Lepidoptera: Tortricidae: Grapholitini) in the New World. *Entomologica Scandinavica*, Supplement 58.

Todd. M Gilligan and Marc E. Epstein. 2014. Tortricids of Agricultural Importance (TortAI). [Factsheet - *Gymnandrosoma aurantianum* \(idtools.org\)](#)

Gymnandrosoma aurantianum



Whitish spot off-center on the forewings

Photo by J. Brambila

Wingspan of this specimen: 15 mm

Males of *Gymnandrosoma aurantianum* Lima (Lepidoptera: Tortricidae) are dark brown with light brown, reddish brown and black markings on the forewings, which usually have a distinct whitish spot one-third from the outer margin. The color is variable and not very distinctive from other similar tortricids. Close examination of the antennae, hind tibiae, and hind wings is essential in screening for this species. For final identification, dissection of genitalia is required.

Gymnandrosoma aurantianum

External male diagnostic characters

Males have a modification on the antennae consisting of a shallow notch made by slightly compressed flagellomeres 6 through 10.



The inner area of the hindwing has an elongate, smooth and shallow concave pocket with a tuft of long scales.



They also have a large cluster of sex scales forming a hair pencil dorsally on each hind tibia.

Gymnandrosoma aurantianum

Male genitalia

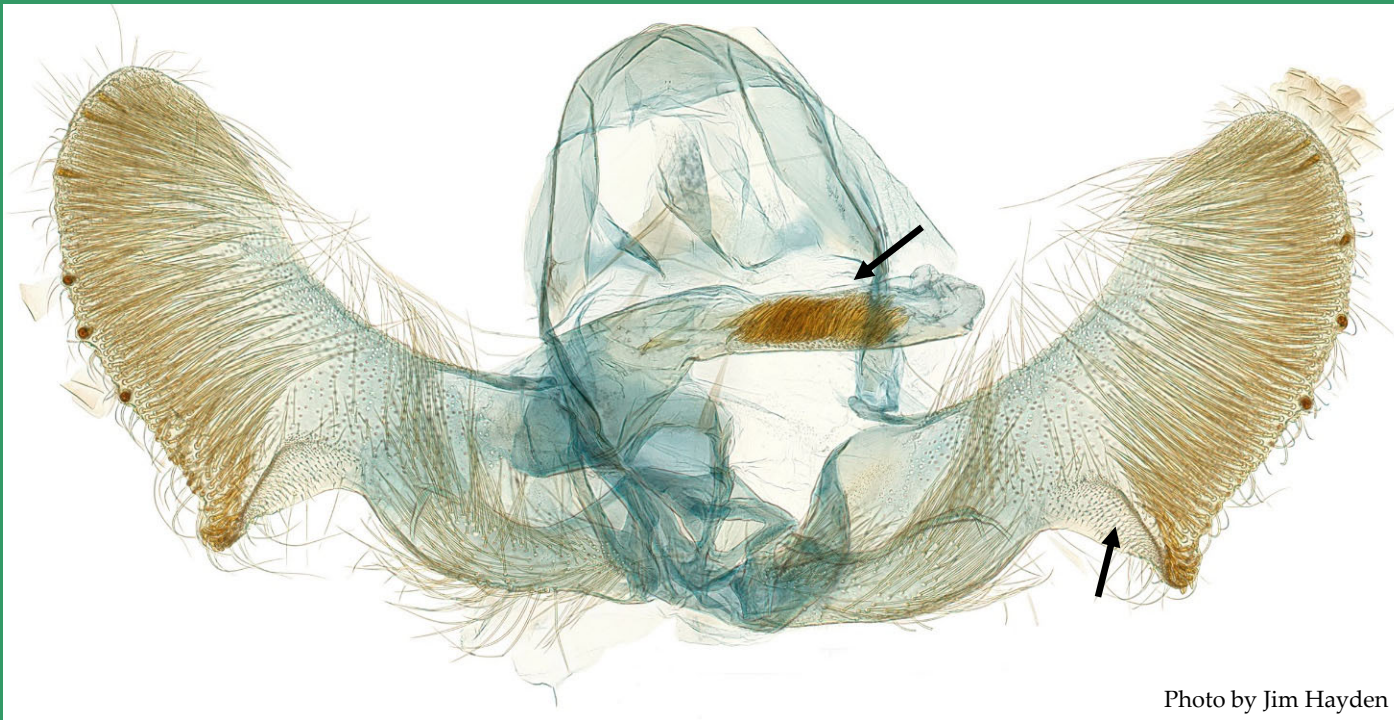


Photo by Jim Hayden

Inside the phallus (left arrow) the vesica has a long and dense row of cornuti (a set of about 130 spines).

The postsaccular arch (right arrow) is concave, ending in a pointed ridge.

An additional photograph by Todd Gilligan is available at the following site:

https://idtools.org/id/leps/tortai/Gymnandrosoma_aurantianum.htm

From "Tortricids of Agricultural Importance", by Todd M. Gilligan and Marc E. Epstein, 2014. <http://idtools.org/id/leps/tortai/index.html>

Gymnandrosoma punctidiscanum



Photo by Todd Gilligan

The primary diagnostic character is a pair of bundles of long pale-yellow scales forming two tassels dorsally on the abdomen (see arrow).

Male *Gymnandrosoma punctidiscanum* Dyar are the most commonly caught tortricid moths in traps for *G. aurantianum*. Their forewings are similar; so, forewing color pattern differences are not useful for separating them. Both species have modified hindwings as well. However, the antennae are not modified; flagellomeres 6 through 10 are not compressed and do not form a notch.

Gymnandrosoma punctidiscanum

External male diagnostic characters



The hindwings of *G. punctidiscanum* and *G. aurantianum* have an elongate, shallow, smooth, fold on the inner margin.

The hind tibia is modified with two tufts of gray or brown scales (see arrow) on the anterior dorsal surface.



The pale-yellow tassels on the abdomen are found above three broad patches of flattened grayish brown scales (see arrow). Both characters are absent in *G. aurantianum*.

Photos by J. Brambila

Gymnandrosoma punctidiscanum

Male genitalia

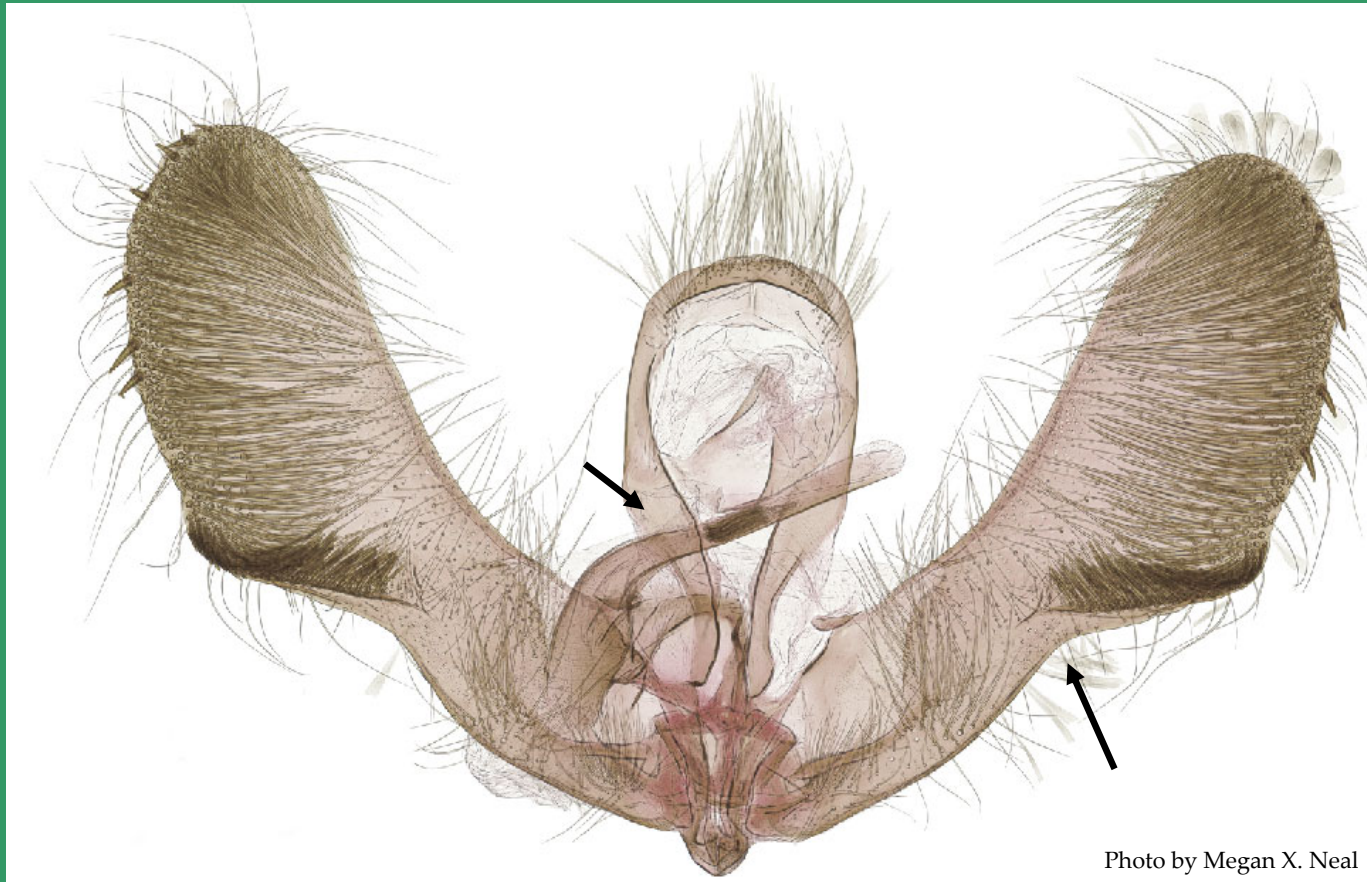


Photo by Megan X. Neal

The phallus (left arrow) is apically narrow and elongate and the vesica has a dense row of short cornuti (a set of 25 to 30 spines).

The postsaccular arch (see right arrow) is not concave and only shows as a shallow constriction.

Slide prepared by Jim Hayden

Gymnandrosoma desotatum



Photo by J. Brambila

The hindwing is not modified with folds that form a smooth shallow pocket on the inner margin.

Males of *Gymnandrosoma desotatum* Heinrich, a native species, are occasionally caught in traps with the pheromone for *G. aurantianum*. The forewings are variable in color. The basal, postbasal, and median areas and bands are dark brown, and the postmedian-distal area ranges from brown to pale brown or brownish gray. They usually have the same postmedian white spot as in *G. aurantianum* and *G. punctidiscanum*. The antennae are not modified (=flagellomeres 6 through 10 not compressed); the hind wings lack an inner smooth pocket; the abdomen does not have tufts of long pale-yellow scales (tassels); and the hind tibiae do not have clusters or bundles of modified setae. Genitalic dissection is required if species identification is needed.

Gymnandrosoma desotatum

Male genitalia

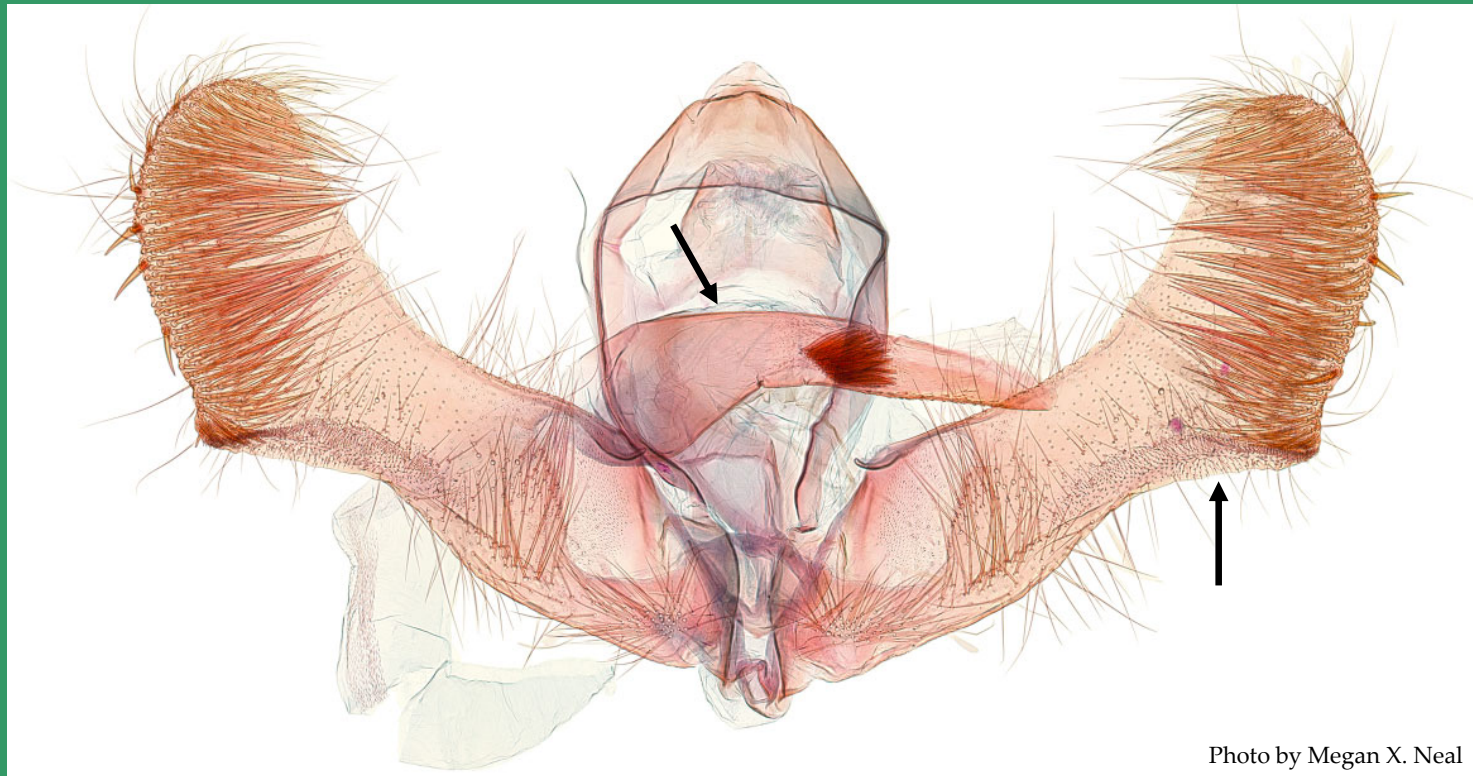


Photo by Megan X. Neal

Inside the phallus (left arrow) the vesica has a short row of cornuti (a set of about 18 to 20 spines).

The postsaccular arch (right arrow) is shallowly concave, ending in a mildly pointed ridge.

Slide prepared by Jim Hayden

Gymnandrosoma sp.

Male genitalia

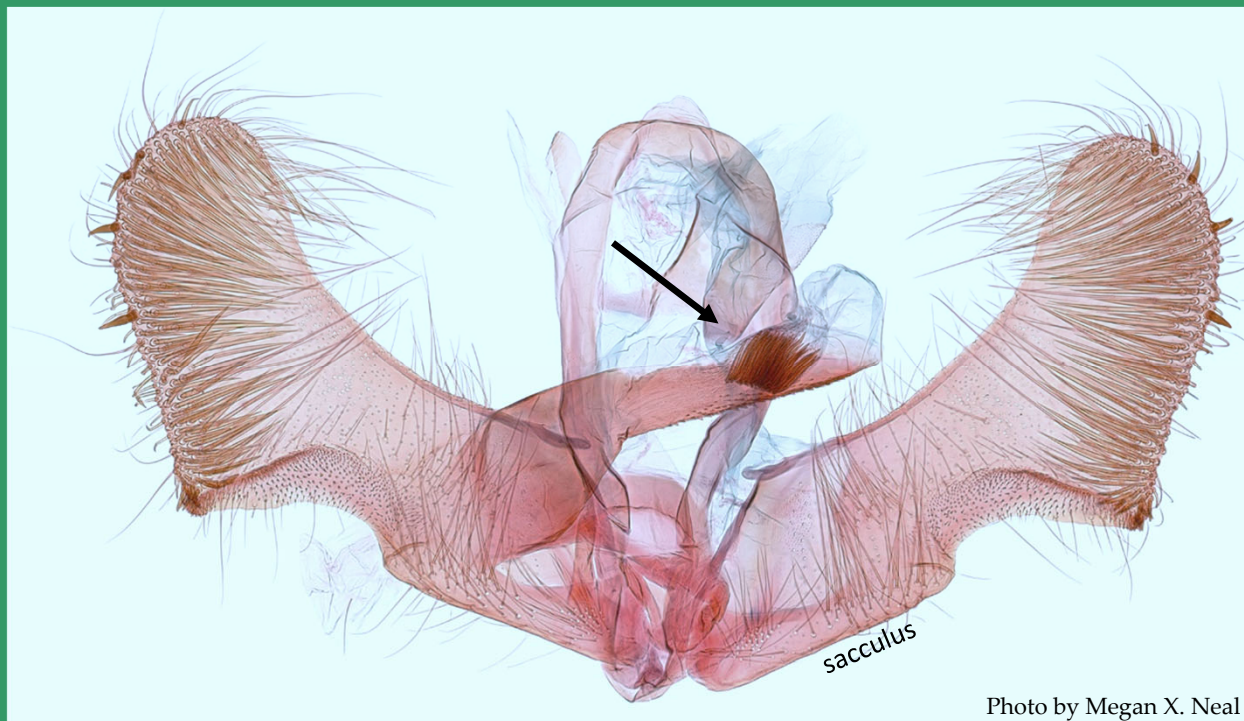


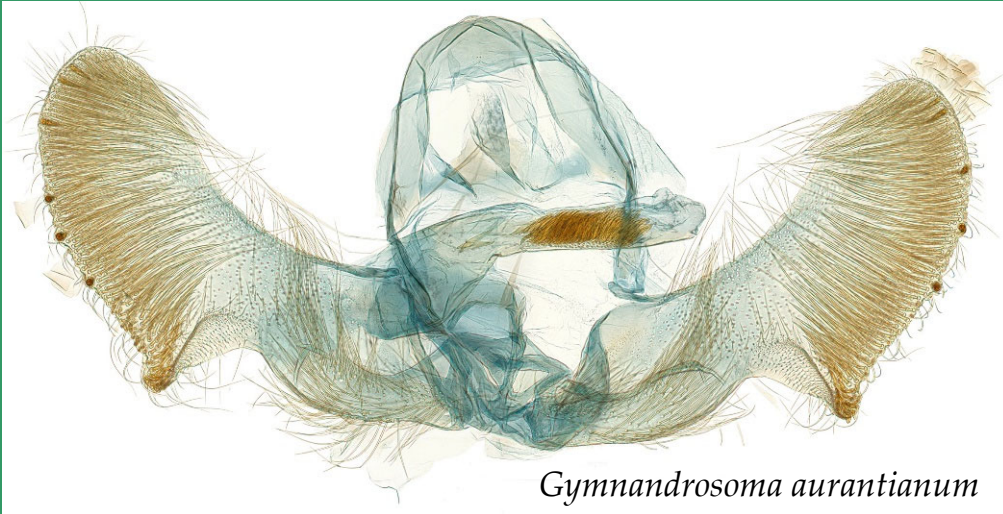
Photo by Megan X. Neal

Slide prepared by Jim Hayden

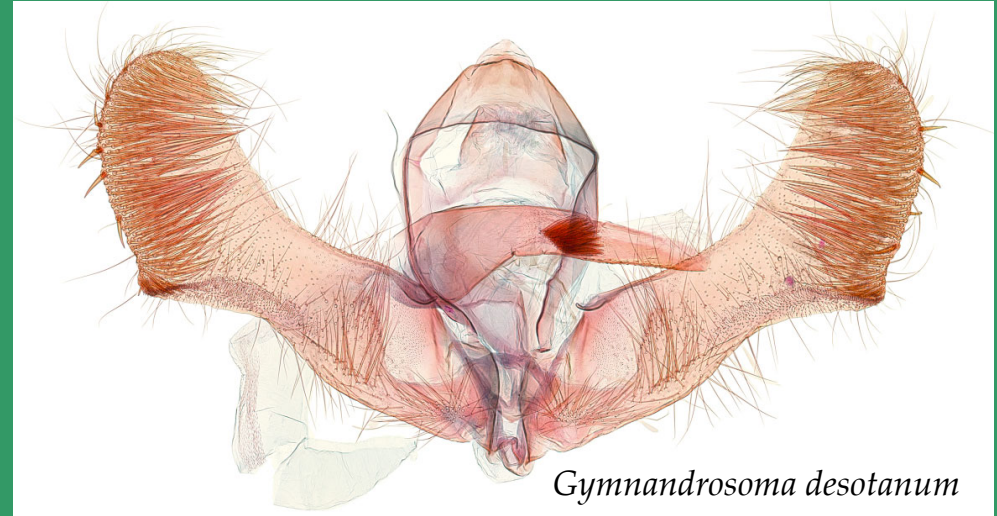
Males of an undescribed species of *Gymnandrosoma* are also occasionally caught. In external morphology and wing coloration they appear most similar to *G. desotatum* but the genitalia are distinct and are different from the genitalia of *G. desotatum*, *G. punctidiscanum* and *G. aurantianum*. At present it can only be identified by dissection. Inside the phallus the vesica has a short row of cornuti (see arrow) (a set of about 18 to 20 spines). The sacculus appears to have a straight or raised margin ending in a slight projection before the saccular arch, not seen in the other three species.

Gymnandrosoma spp.

Male genitalia



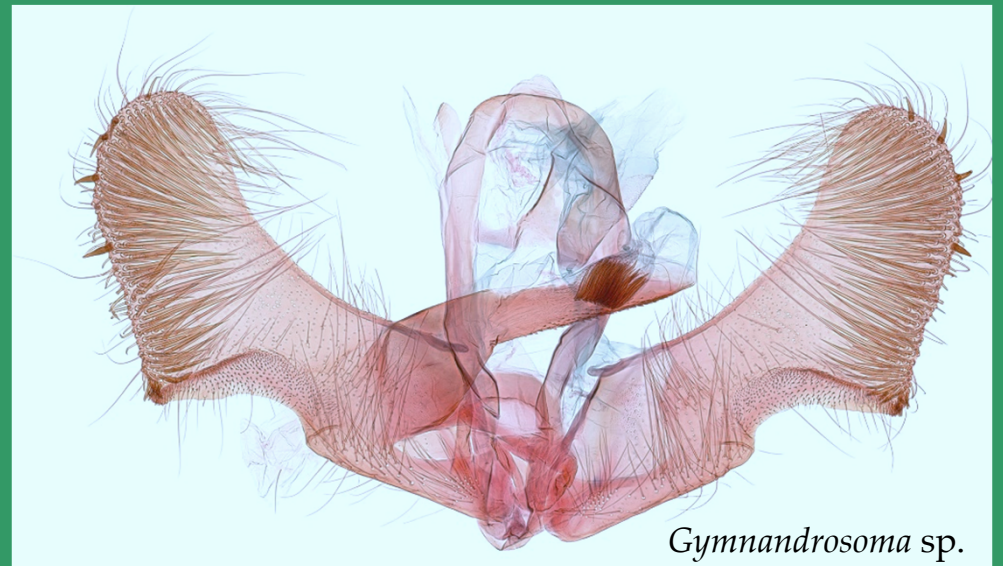
Gymnandrosoma aurantianum



Gymnandrosoma desotatum



*Gymnandrosoma
punctidiscanum*



Gymnandrosoma sp.

Ecdytolopha mana



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Photo by Mark Dreiling

Ecdytolopha mana (Kearfott) moths are commonly found in sticky traps for *G. aurantianum*. These are smaller moths (see table below) than the *Gymnandrosoma* species attracted to the traps. This species lacks the white spot on the forewing. Instead, the apical third of the forewing is mostly white with a large grey spot (see arrow). These tortricid moths also lack other characters mentioned for *Gymnandrosoma* species, including a smooth concavity on the hindwing, pale-yellow tassels on the abdomen, modified setae on the hind tibiae or a notch on the antennae.

Some male forewing lengths, according Adamski and Brown (2001):

Gymnandrosoma aurantianum 6.2 to 8.2 mm

Gymnandrosoma punctidiscanum 8.0 to 10.4 mm

Gymnandrosoma desotanum 8.0 to 11.0 mm

Ecdytolopha mana 5.8 to 7.9 mm (=smaller than *Gymnandrosoma*)

Ecdytolopha mana

Male genitalia



Photo by Kevin M. Burnette



Photo by J. Brambila

Ecdytolopha palmetum



The tortricid species *Ecdytolopha palmetum* (Heinrich) is also occasionally found in traps with pheromones for *Gymnandrosoma aurantianum*. These are smaller moths (male forewing 5.5 to 8.0 mm long) than the *Gymnandrosoma* species listed in this identification aid. The forewing is brown with some metallic scales and has a large white semicircular spot (see arrow) on the hind margin. This species is only found in southern Florida counties.



Photo by J. Brambila

Ecdytolopha palmetum

Male genitalia

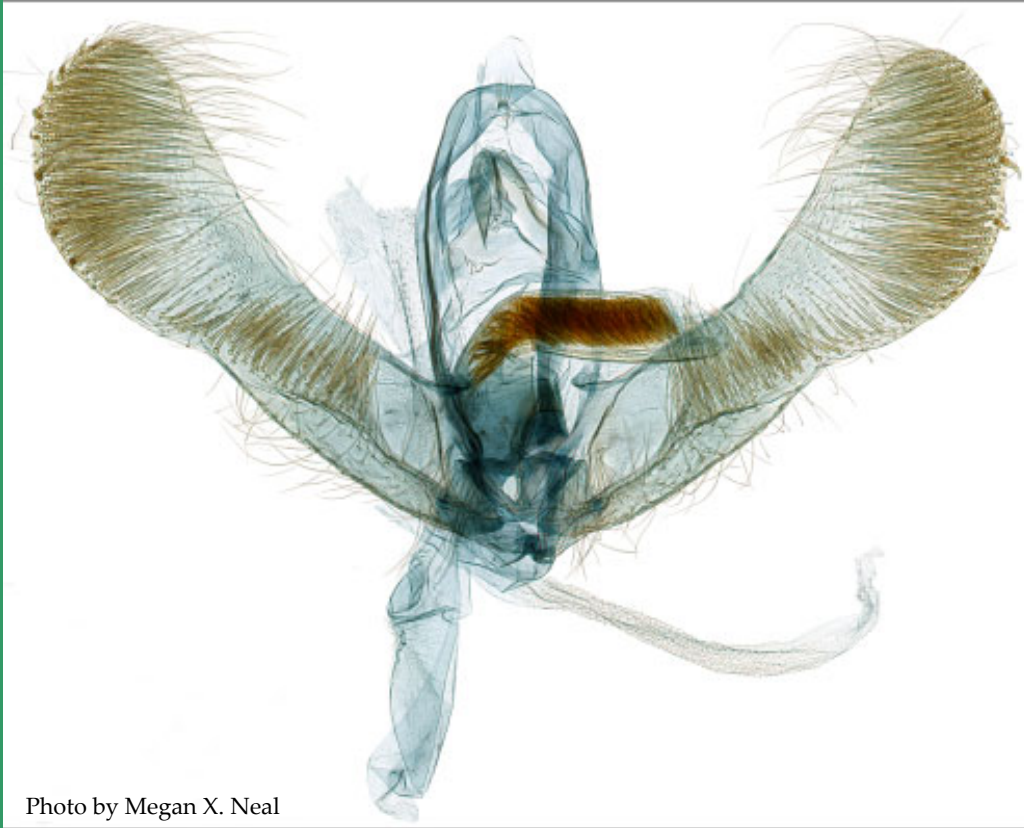


Photo by Megan X. Neal

Slide prepared by Jim Hayden



Photo by J. Brambila

Cydia erotella



Photo by J. Brambila

Cydia erotella (Heinrich) is also a common non-target in traps for *Gymnandrosoma aurantianum*. It can be distinguished primarily by its forewing coloration, brown with metallic golden striations. It is smaller in size (spread, 9 to 10 mm according to the original description) than the target and the other non-targets. The specimen presented here has a forewing of 5 mm in length. The genitalia are distinct, especially by the presence of a single cornutus in the vesica.

Cydia erotella

Male genitalia

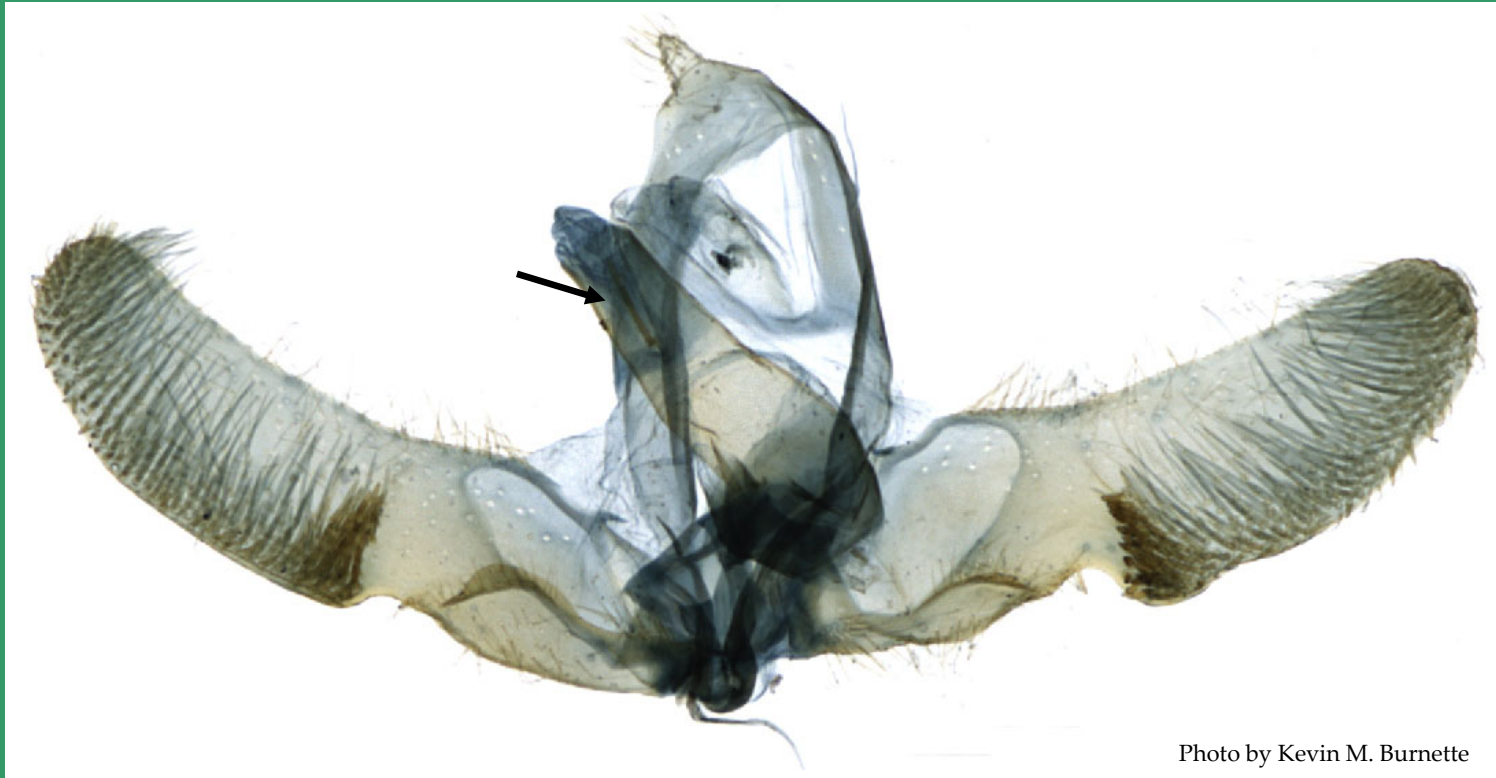


Photo by Kevin M. Burnette

Slide prepared by Jim Hayden

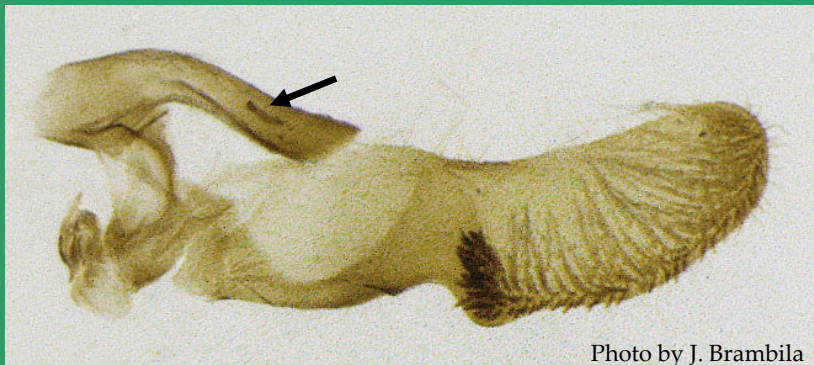


Photo by J. Brambila

Notice the single cornutus in the vesica, marked with black arrows

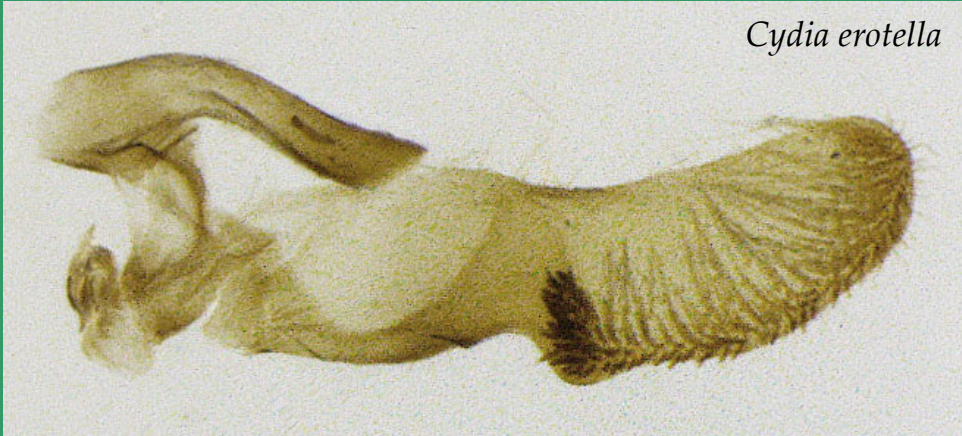
Additional common non-targets

Male genitalia (one valva and phallus)

Ecdytolopha mana



Cydia erotella



Ecdytolopha palmetum



Photos by J. Brambila