Gymnandrosoma aurantianum

Citrus Fuit 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 from the Division of Plant Industry, Florida Department of Agriculture and Consumer Services (FDACS-DPI) 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 work 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, CDFA). Final identification of *Ecdytolopha mana* came from Todd Gilligan and Jim Hayden. Ariana Gaskin (FDACS-DPI, CAPS) was involved in sample processing (target screening, specimen cleaning, dissection and identification). Identification for *Cydia erotella* came from Sara Furgeson (FDACS-DPI, CAPS program). Photographs are by J. Brambila unless otherwise indicated.

PRIMARY SOURCES:

ADAMSKI, D. and J.W. BROWN. 2001. Systematic revision of the *Ecdytolopha* group of genera (Lepidoptera: Tortricidae: Grapholitini) in the New World. Entomologica Scandinavica, Supplement 58.

GILLIGAN, T.M. and M.E. EPSTEIN. 2014. Tortricids of Agricultural Importance (TortAI). Factsheet - *Gymnandrosoma aurantianum* (idtools.org). Last accessed June 2023.

Dorsal aspect

Gymnandrosoma aurantianum

Wingspan of this specimen: 15 mm

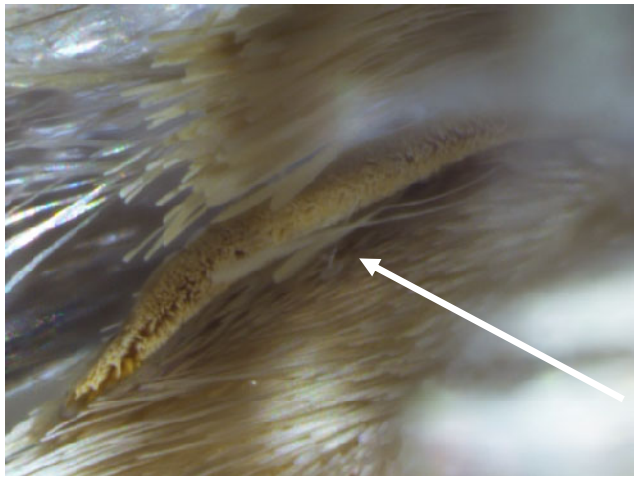
Males of *Gymnandrosoma aurantianum* Lima (Lepidoptera: Tortricidae) have forewings 6.0 to 10.5 mm long and are dark brown with light brown, reddish brown and black markings. Usually, the forewings have a distinct whitish spot one-third from the outer margin. The color is variable and not very distinctive from other similar tortricids. Close examination of the antenna, hind tibia, and hind wing is essential in screening for this species. For final identification, dissection of genitalia is required.

Gymnandrosoma aurantianum

Male external diagnostic characters

Antenna with a shallow notch made by slightly compressed flagellomeres 6 through 10

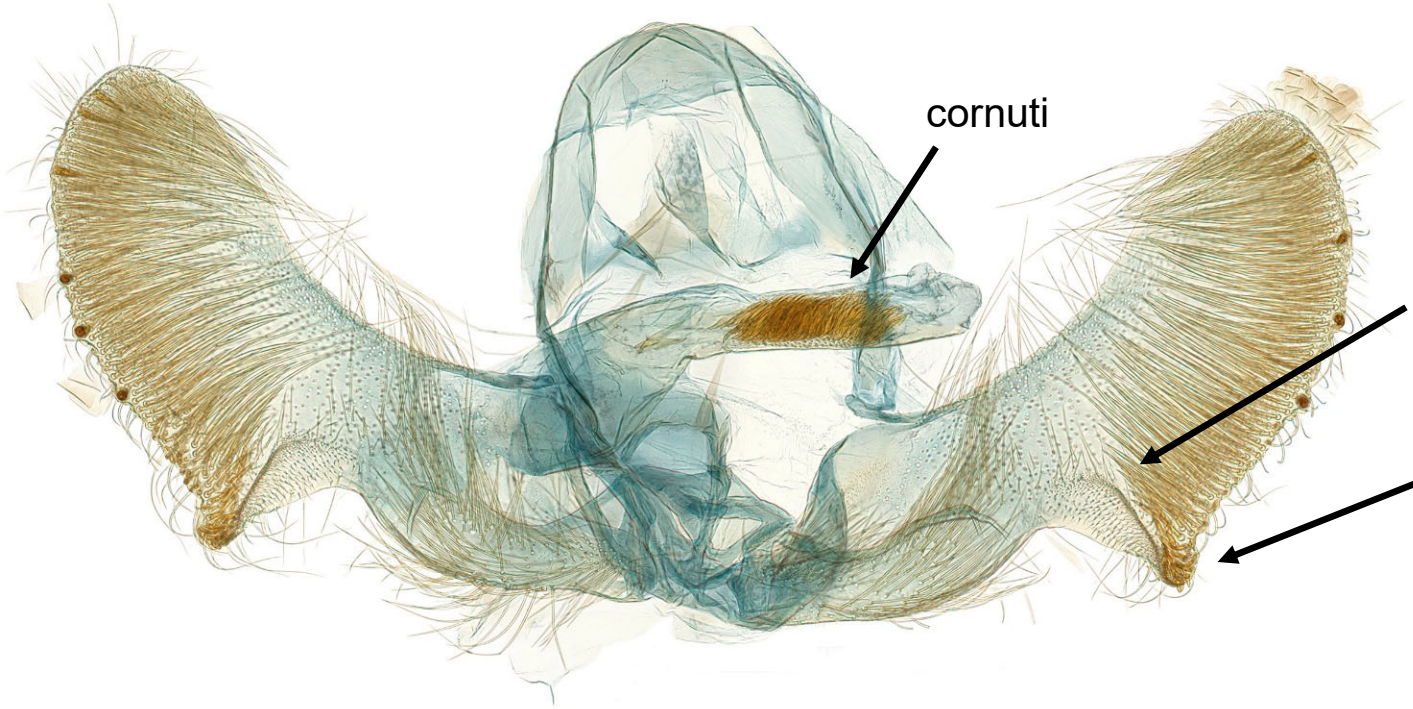
Notch



Hind tibia with a large cluster of sex scales forming a “hair pencil”

Hindwing with an elongate, smooth, concave and shallow fold (pocket) on the inner angle, and with a tuft of long scales

Gymnandrosoma aurantianum



An additional photograph of the male genitalia of *G. aurantianum* by Todd Gilligan is available at the following site:

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

Slide and photo by
James Hayden

Dorsal aspect

Gymnandrosoma punctidiscanum

The primary diagnostic character is a pair of bundles (tassels) of long pale-yellow or golden scales on the base of the abdomen

Photo by Todd Gilligan

Male *Gymnandrosoma punctidiscanum* Dyar are the most commonly caught tortricid moths in traps for *G. aurantianum*. Their forewings are similar; so, forewing color pattern is not a useful character. Both species have hindwings modified with folds on the inner angle. However, in *G. punctidiscanum* the antennae do not have a notch formed by compressed flagellomeres 6 through 10 and the hind tibia does not have a hair pencil.

Gymnandrosoma punctidiscanum

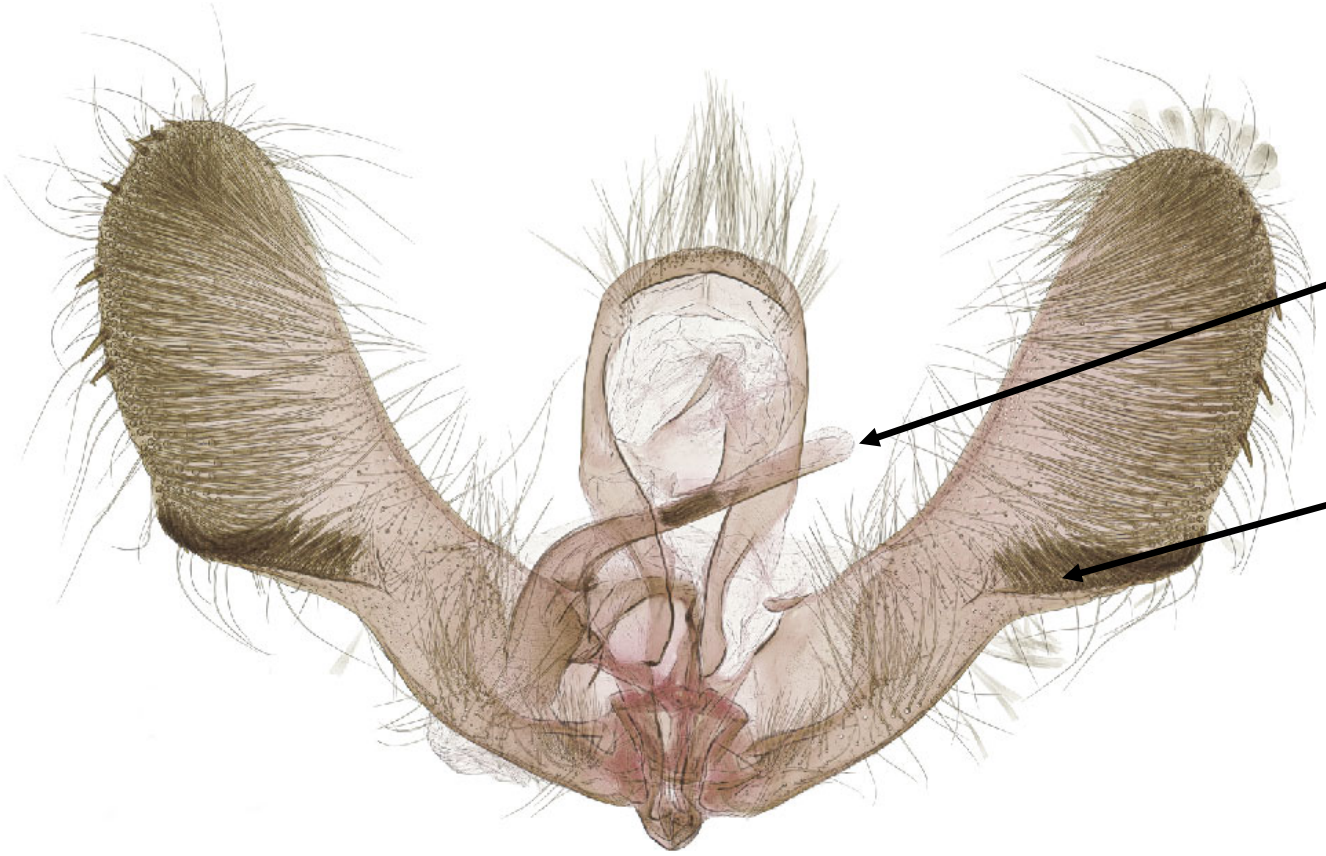
Male external diagnostic characters

Hindwing with an oval, smooth, concave and shallow fold (pocket) on the inner angle

Hind tibia modified with two tufts of long gray or brown scales on the dorsal surface

Abdomen with two pale-yellow or golden tassels dorsally above three broad patches of flattened gray or brown scales, not present in *G. aurantianum.*

Gymnandrosoma punctidiscanum



Phallus apically narrowed and vesica with a dense row of short cornuti (25 to 30)

Postsaccular arch not concave, only showing as a shallow constriction

An additional photograph of the male genitalia of *G. punctidiscanum* by Todd Gilligan is available at the following site:

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

Photo by Megan Neal
Slide prepared by James Hayden

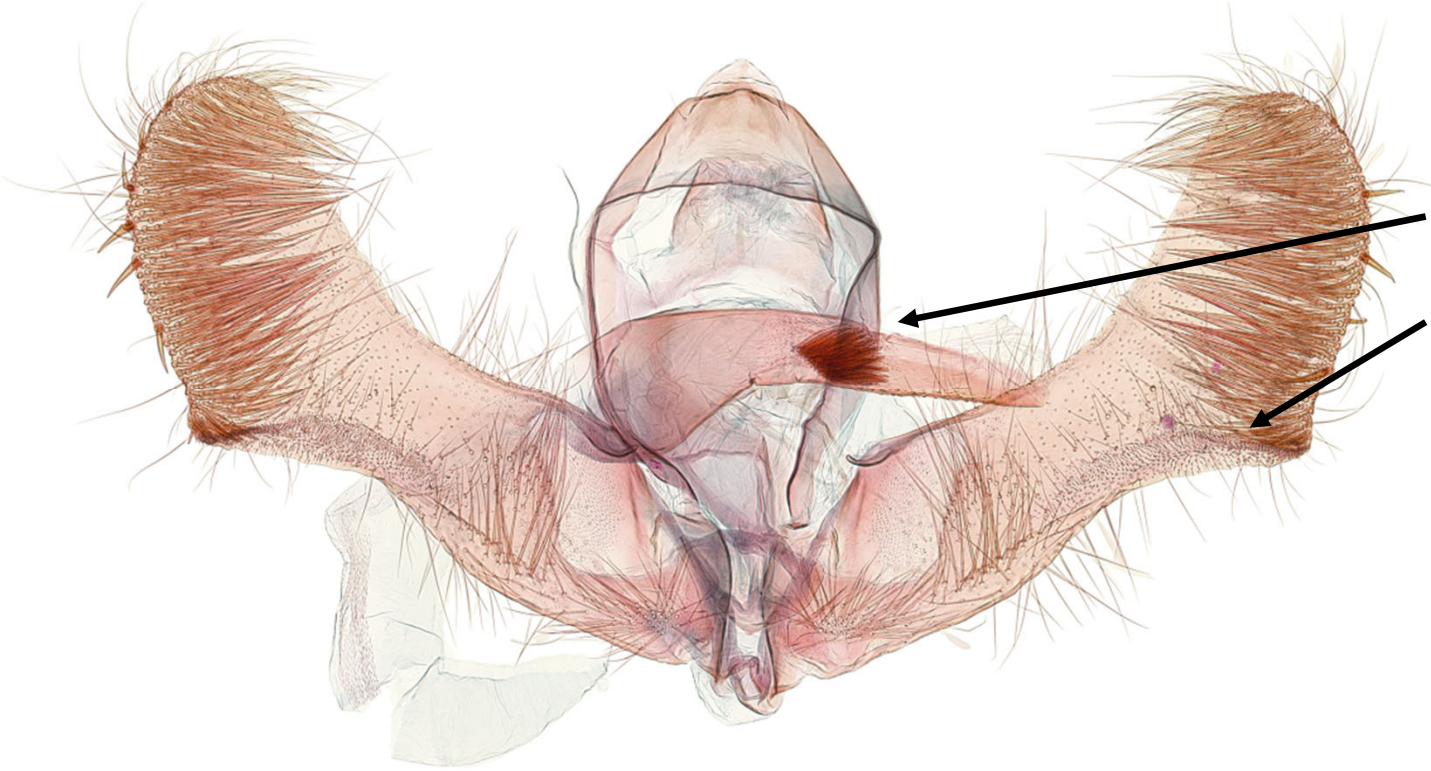
Dorsal aspect

Gymnandrosoma desotanum

Hindwing not modified with folds that form a smooth shallow pocket on the inner margin

Males of *Gymnandrosoma desotanum* Heinrich are occasionally caught in traps with the pheromone for *G. aurantianum*. The forewing is 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 antenna is not modified (=flagellomeres 6 through 10 not compressed); the hind wing lacks an inner smooth pocket; the abdomen does not have tufts of long pale-yellow or golden scales (tassels); and the hind tibia does not have clusters or bundles of modified setae. Genitalia dissection is required for species identification.

Gymnandrosoma desotanum

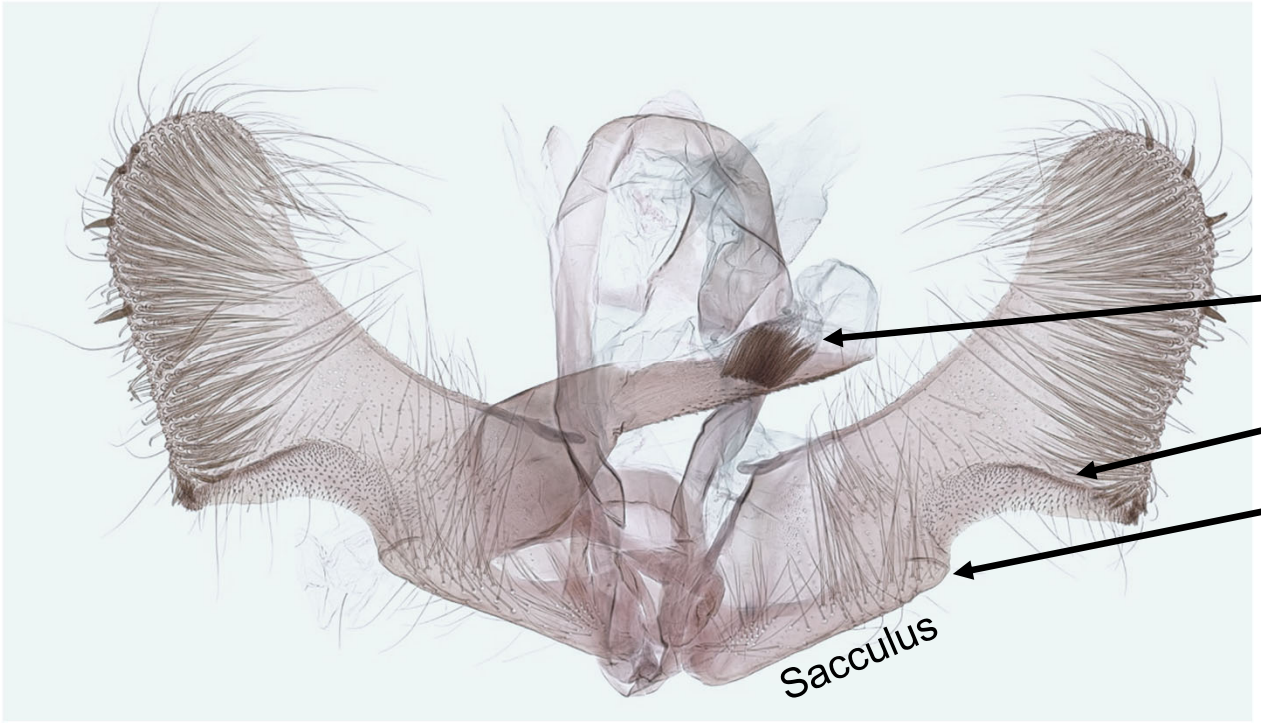


Vesica with a short row of cornuti (18-20)

Postsaccular arch not concave, only showing as a shallow constriction

Photo by Megan Neal
Slide prepared by James Hayden

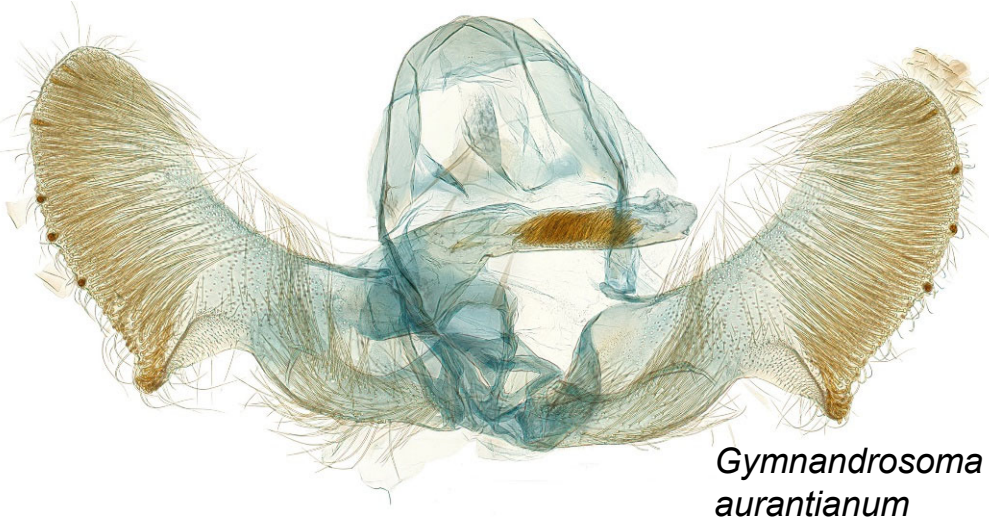
Gymnandrosoma sp.



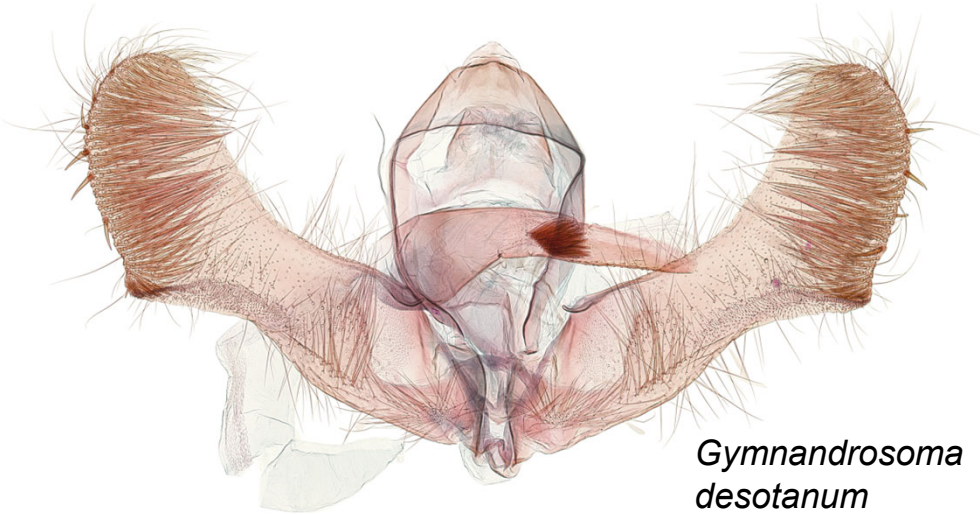
Males of an undescribed species of *Gymnandrosoma* are occasionally caught in traps for *G. aurantianum*. In external morphology and wing coloration they appear most similar to *G. desotanum* males. At present, this undescribed species can only be identified by dissection because the genitalia are distinct.

Male genitalia
of four species

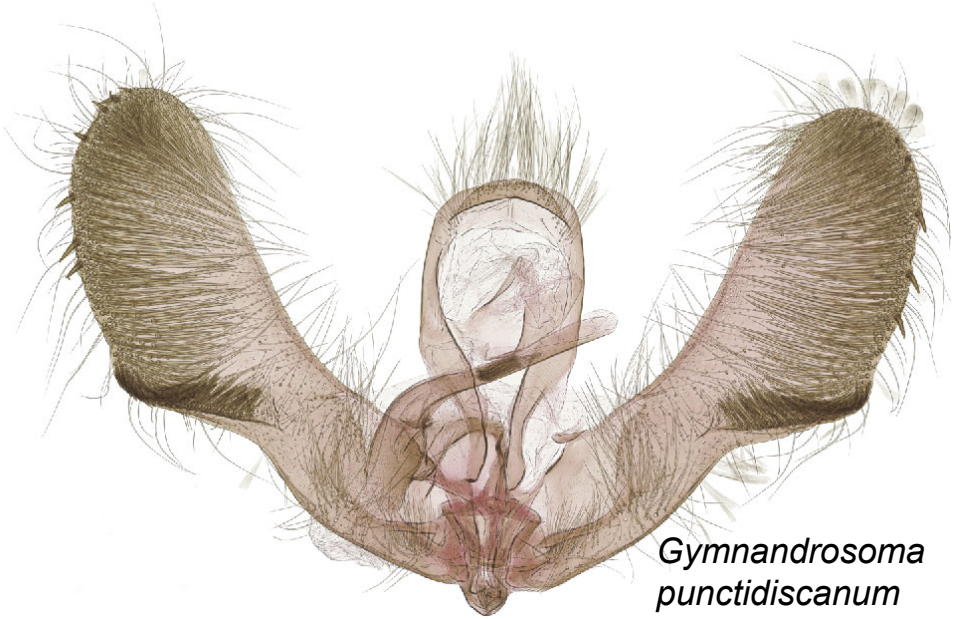
Gymnandrosoma spp.



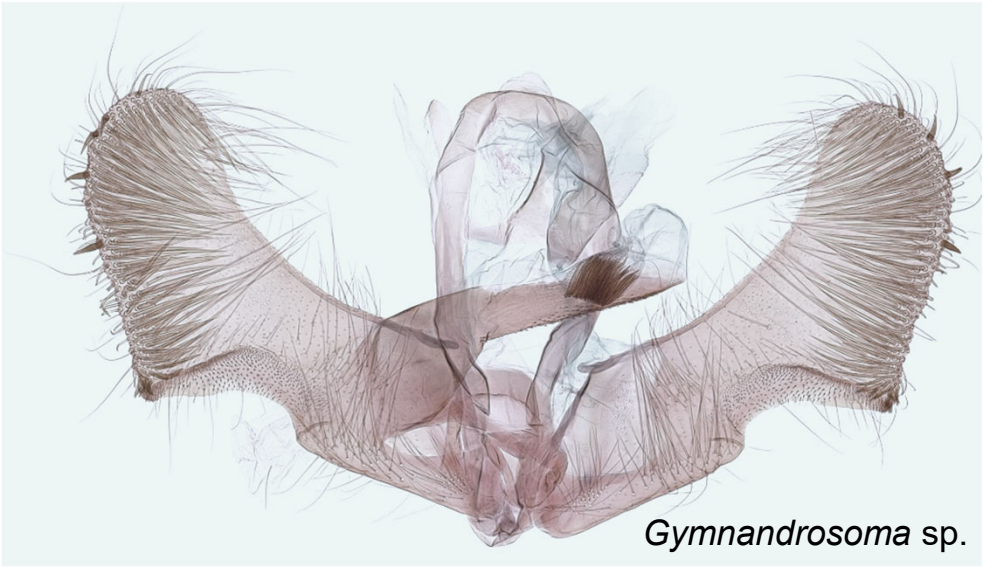
Gymnandrosoma aurantianum



Gymnandrosoma desotanum



Gymnandrosoma punctidiscanum



Gymnandrosoma sp.

Ecdytolopha mana

Ecdytolopha mana (Kearfott) moths are commonly found in sticky traps for *G. aurantianum.* These are smaller moths (see table below) than the *Gymnandrosoma* moths 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. These tortricid moths also lack other characters mentioned for *Gymnandrosoma* species, including a smooth concavity on the hindwing, pale-yellow or golden tassels on the abdomen, modified setae on the hind tibia or a notch on the antenna.

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

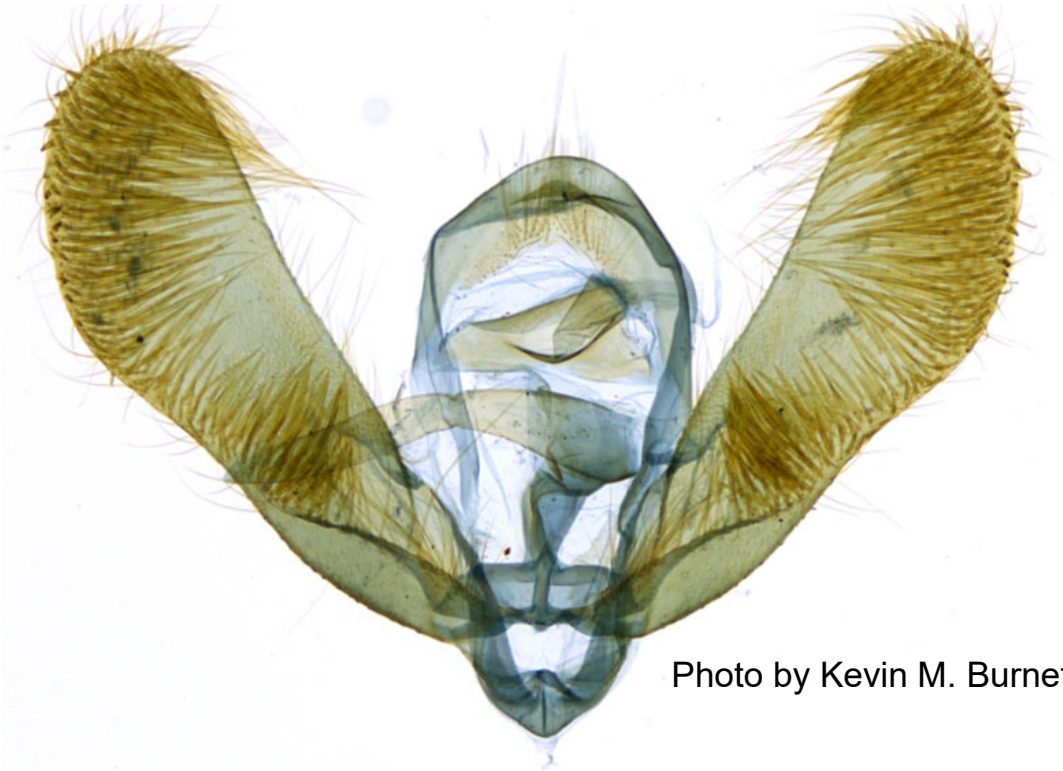
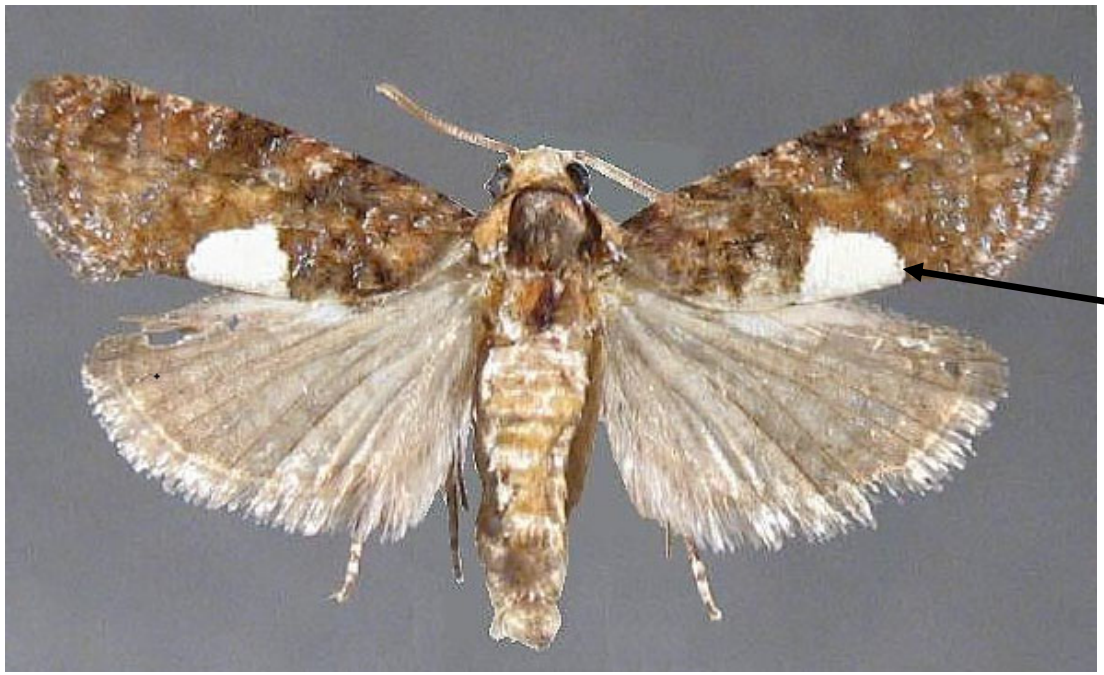


Photo by Kevin M. Burnette

Ecdytolopha palmetum



Forewing with a large white semicircular spot on the dorsum (=inner margin)

Photo by James Hayden

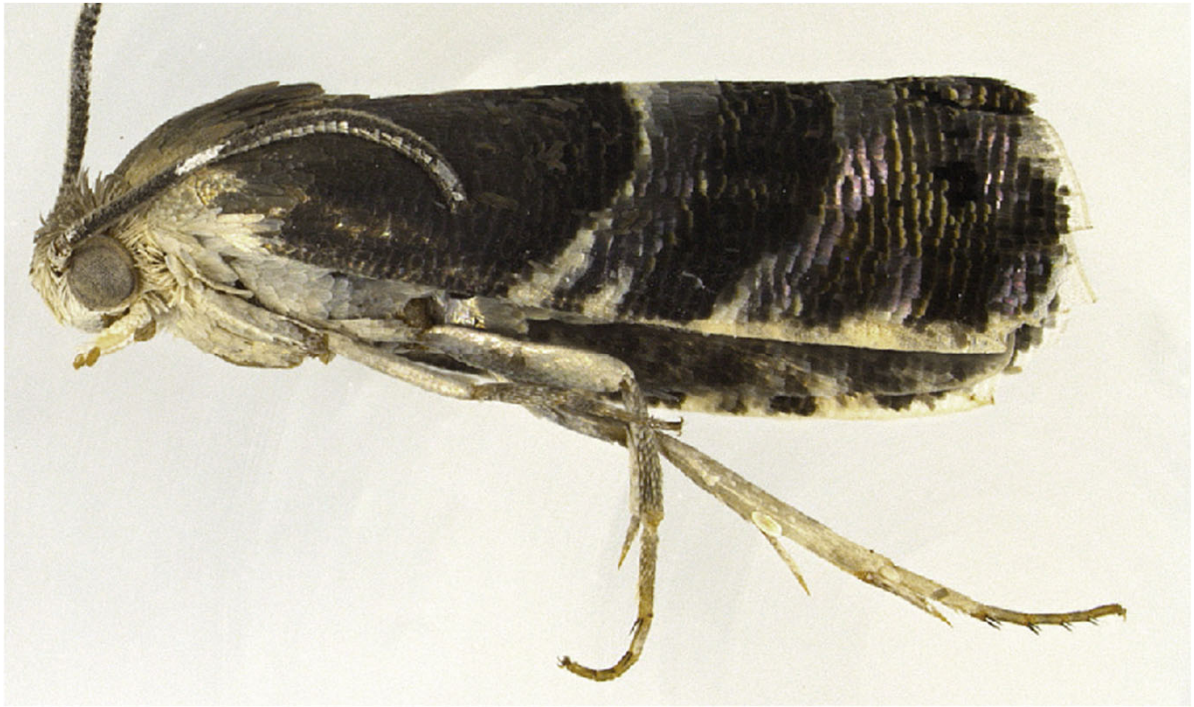
Ecdytolopha palmetum (Heinrich) is occasionally found in traps with the pheromone for *Gymnandrosoma aurantianum.* These are smaller moths (male forewing 5.5 to 8.0 mm long) than the *Gymnandrosoma* moths mentioned in this identification aid. The forewing is brown with some metallic scales and has a large white semicircular spot on the inner margin.

Male
genitalia

Ecdytolopha palmetum

Photo by Megan Neal
Slide prepared by James Hayden

Cydia erotella



Cydia erotella (Heinrich) is 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. Dissection is recommended since the genitalia are distinct.

Male genitalia

Cydia erotella

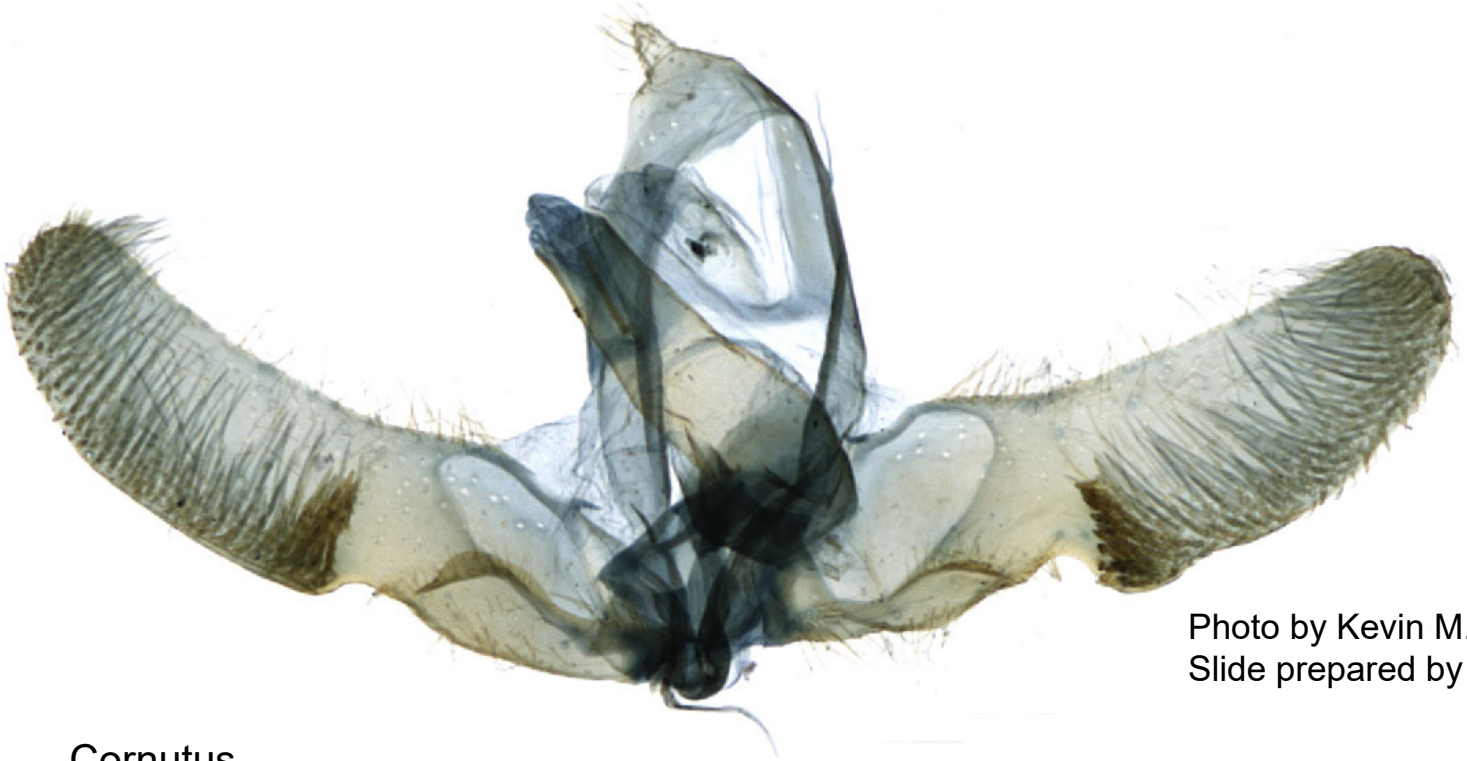
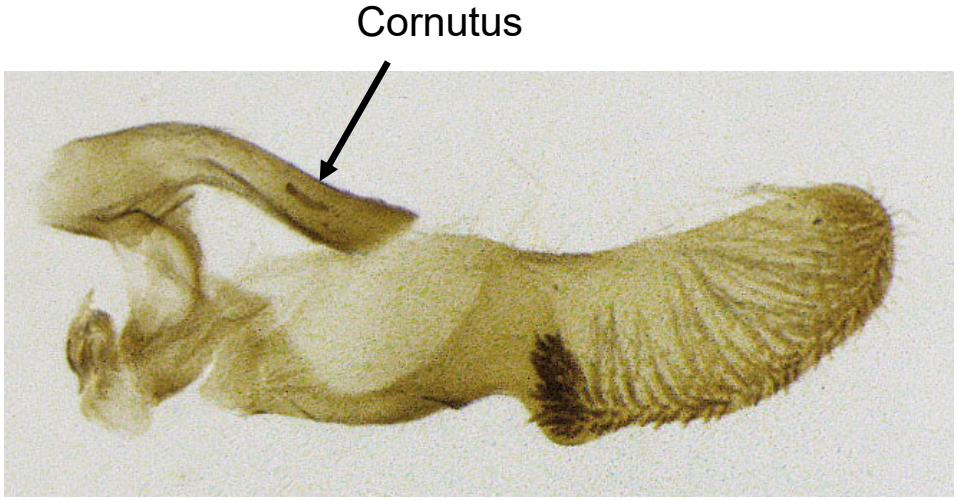


Photo by Kevin M. Burnette
Slide prepared by James Hayden



The genitalia of *Cydia erotella* are distinct, primarily due to the single cornutus in the vesica

Common non-targets

Male genitalia (one valva and phallus)