Screening Aid

European Grape Berry Moth

Eupoecilia ambiguella (Hübner)

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The European grape berry moth, *Eupoecilia ambiguella* (Hübner), is a pest of grape in the Palearctic. It is widely distributed across Europe and parts of Asia, often in the same locations as *Lobesia botrana*, the European grape vine moth (EGVM), although *E. ambiguella* is more common in cooler and humid climates than *L. botrana*. Larvae can cause significant damage in vineyards by feeding on buds, pedicels, flowers, and also directly in the grape berries. This species completes two generations per year over most of its range.



Fig. 1: *Eupoecilia ambiguella* resting adult (Photo from Photozou).

Eupoecilia ambiguella is a member of the Tortricidae (tribe Cochylini), a large family of moths (Lepidoptera) that includes many pest species. In North America there are approximately 1,200 species of tortricids, which are often referred to as “leafrollers” because the larvae of some species feed inside a rolled leaf. Most tortricid moths are small and brown with a wingspan of approximately 10-30 mm. Although no members of *Eupoecilia* occur in North America, individuals of *E. ambiguella* appear similar to several Nearctic Cochylini. Forewings are yellow to yellowish orange or brown with a well-defined dark brown to black band extending across the middle of the wings. A genitalic dissection by a specialist is necessary to confirm identity.



Fig. 2: *Eupoecilia ambiguella* male.

This aid is designed to assist in the sorting and screening *E. ambiguella* suspect adults collected from CAPS sticky traps in the continental United States. It covers basic sorting of traps, first level screening, and second level screening, all based on morphological characters. Basic knowledge of Lepidoptera morphology is necessary to screen for *E. ambiguella* supsects. For more information on this and other pest tortricids, please consult the following resource:

Gilligan, T. M. & M. E. Epstein. 2012. TortAI, Tortricids of Agricultural Importance to the United States (Lepidoptera: Tortricidae). Identification Technology Program (ITP), USDA-APHIS-PPQ-S&T, Fort Collins, CO. (http://idtools.org/id/leps/tortai).

CAPS Approved Trapping Method: Wing pheromone trap

Eupoecilia ambiguella pheromone traps should be sorted initially for the presence of moths of the appropriate size, color, and shape. Traps that contain moths meeting all of the following requirements should be moved to Level 1 Screening (Page 3):

1) Moths are approximately 7-10 mm (0.25-0.4 inches) long (Fig. 3).

2) Moths have an overall shape that is similar to the outline depicted in Fig. 3. Note that moths caught on their side or back may have a different outline.

3) Moth forewings are a shade of yellow or yellowish brown with a dark brown to black markings similar to the adults shown in Fig. 4.

Note that the appearance of moths caught in sticky traps can vary substantially depending on the amount of sticky glue on the moth (most individuals usually appear darker when covered in glue). For this reason, any small, tortricidlike moth meeting the above criteria should be sent forward to Level 1 Screening.

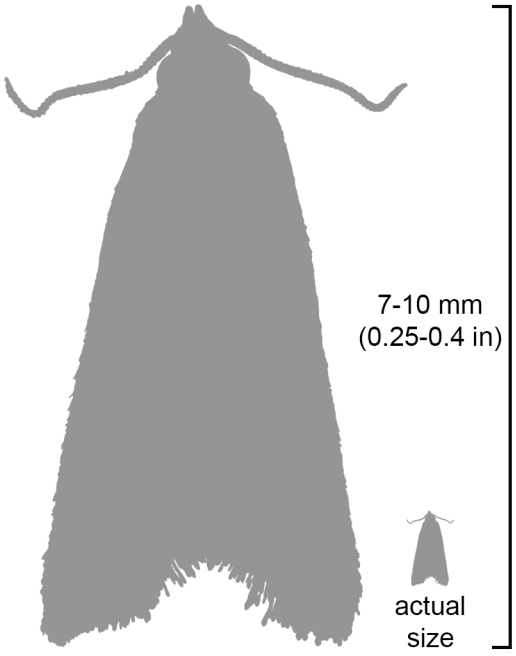


Fig. 3: Outline and size of a resting *E. ambiguella* male. Many non-target tortricids have a similar appearance.



Fig. 4: Variation in wing pattern and coloration of *E. ambiguella* adults. The wing pattern is the same in both males and females and consists of yellowish forewings with a dark brown to black band extending across the wing (also see Fig. 5).

Level 1 & 2 Screening

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Moths that meet the sorting requirements should be screened for suspect tortricids. Level 1 & 2 Screening utilizes the same characters. Screeners should proceed through the characters listed here as far as their expertise allows and forward remaining suspect tortricids for identification. Screening can be moderately difficult and may need to be performed by a trained Lepidopterist.

Level 1 Screening

Suspect tortricids have the following combination of characters:

1) Antennae simple, threadlike, and never pectinate (feathery).

2) Labial palpi pointed and projecting forwards (Fig. 6). Some families (especially in the Gelechioidea) have long labial palpi that curve upwards over the head - these are not tortricids.

3) Maxillary palpi are very reduced and not visible in tortricids. Maxillary palpi are visible in some commonly intercepted pyraloid species.

4) Proboscis (tongue) unscaled. Members of the Gelechioidea and Pyraloidea have a scaled proboscis.

Suspect tortricids meeting the above conditions should be moved to Level 2 Screening. If traps are to be forwarded to another facility for further screening, follow the steps at the bottom of this page to ensure they are packed correctly. Only proceed to Level 2 Screening if expertise if available.

Level 2 Screening

Suspect tortricids should be cleaned to identify suspect *E. ambiguella* individuals. Instructions on cleaning specimens caught in sticky traps can be found here: http://idtools.org/id/leps/tortai/dissections.html. Cleaned specimens should be properly pinned and labeled. Suspect *E. ambiguella* are identified by their distinctive forewing pattern:

5) The forewing pattern for *E. ambiguella* is identical in both males and females and consists of a yellow, yellowish-orange, or yellowish-brown ground color with a dark brown to black band that extends across the wing (from costa to dorsum; Figs. 4-5). The band is wider along the costa and narrows towards the dorsum; this is in contrast to many North American non-target Cochylini, where dark bands on the wings are wider along the dorsum. Small patches of dark scales may also be present along the dorsum and near the apex or along the termen of the forewing.

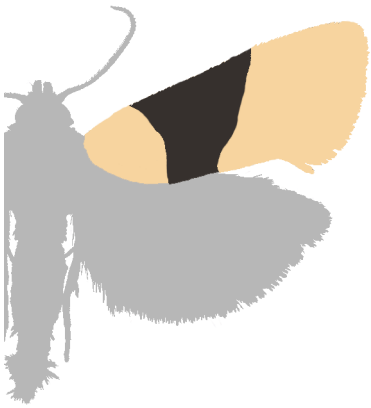


Fig. 5: The basic wing pattern for *E. ambiguella* consists of yellowish forewings with a dark brown to black band extending across the wing. The band is wider along the costa and narrower along the dorsum; this is opposite to that of many North American non-target Cochylini.



Fig. 6: Tortricid head; ch = chaetosema; oc = ocellus; lp = labial palpi. Note that the chaetosema is above the compound eye behind the ocellus (Photo from Gilligan et al. 2008).

Traps that are to be shipped should be carefully packed following the steps outlined in Fig. 7. Traps should be folded, with glue on the inside, making sure the two halves are not touching, secured loosely with a rubber band or a few small pieces of tape. Plastic bags can be used unless the traps have been in the field a long time or contain large numbers of possibly rotten insects. Insert 2-3 styrofoam packing peanuts on trap surfaces without moths to cushion and prevent the two sticky surfaces from sticking during shipment to taxonomists. DO NOT simply fold traps flat or cover traps with transparent plastic wrap (or other material), as this will guarantee specimens will be seriously damaged or pulled apart – making identification difficult or impossible.

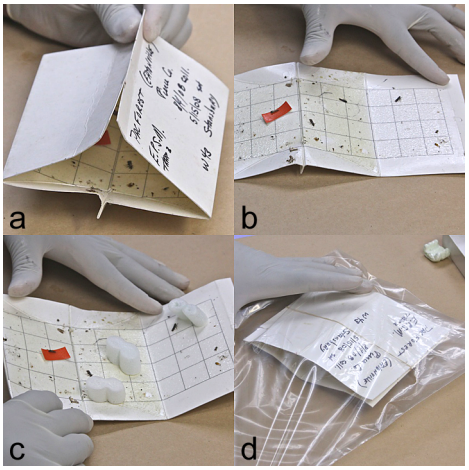


Fig. 7: Recommended packing method for shipment of sticky traps: a & b) open and unfold trap; c) place 2-3 packing peanuts in areas of trap with no moths; d) fold trap, secure with rubber band, and place in plastic bag (Photos by E. LaGasa, WSDA).



Fig. 11: *Aethes deutschiana*.



Fig. 12: *Aethes deutschiana*.



Fig. 13: *Aethes smeathmanniana*.



Fig. 14: *Aethes louisiana*.



Fig. 15: *Cochylis caulocatax*.



Fig. 16: *Phalonidia lepidana*.



Fig. 17: *Phalonidia lepidana*.



Fig. 18: *Carolella sartana*.

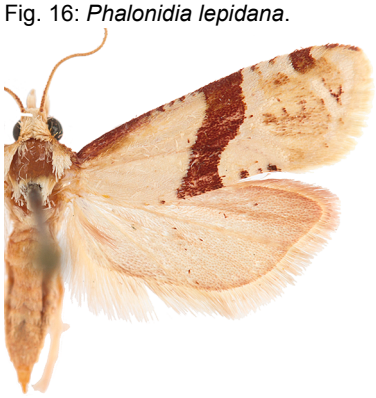


Fig. 19: [*Nycthia*] *pimana*.

It is expected that other Cochylini will be attracted to *E. ambiguella* pheromone traps; a sampling of non-target Cochylini with similar forewing patterns is shown on this page. Note that these species have not been verified to be attracted to *E. ambiguella* pheromone traps and that non-targets will vary by region. Trapping results from the northeastern United States in the 1990's found Noctuidae, Tortricidae, and miscellaneous Gelechioidea were captured. Two very common tortricids were *Episimus argutanus* (Fig. 20) and *Paralobesia viteana* (Fig. 21). In California, it is possible that *E. ambiguella* traps will also attract male *Lobesia botrana* (EGVM; Fig. 22).

Suspect *E. ambiguella* specimens that pass Level 2 Screening (tortricids with forewing coloration and pattern similar to the specimens in Figs. 1-2 and 4-5) should be sent forward for identification. Specimens must be labeled and carefully packed to avoid damage during shipping. Final species-level identification must be performed by a specialist using genitalic characters.



Fig. 20: *Episimus argutanus*.



Fig. 21: *Paralobesia viteana*.



Fig. 22: *Lobesia botrana*.

Key to Sort and Screen *Eupoecilia ambiguella* Suspects in the United States

1. Moths approximately 7-10 mm long; overall shape is typical for a tortricid (Fig. 3); and forewings are a shade of yellow or yellowish brown as in Fig. 4 2
1'. Moths larger or smaller than 7-10 mm long; overall shape not typically tortricid; or forewing color not a shade of yellow or yellowish brown ..... Not *E. ambiguella*

2. Antennae simple and threadlike; labial palpi projecting forward; maxillary palpi inconspicuous; and proboscis not scaled 3
2'. Antennae pectinae or feathery; labial palpi upcurved; maxillary palpi conspicuous; or proboscis scaled ..... Not *E. ambiguella*

3. Forewings yellow, yellowish-orange, or yellowish-brown with a dark brown to black band that extends across the wing from costa to dorsum (Figs. 4-5) ..... ***E. ambiguella suspect***
3'. Forewings not a shade of yellow, or without a dark band extending across the wing ..... Not *E. ambiguella*

Citation

Gilligan, T. M., M. E. Epstein, and S. C. Passoa. 2014. Screening aid: European grape berry moth, *Eupoecilia ambiguella* (Hübner). Identification Technology Program (ITP), USDA-APHIS-PPQ-S&T, Fort Collins, CO. 5 pp.

References for more information on *E. ambiguella* and non-targets

Gilligan, T. M., D. J. Wright and L. D. Gibson. 2008. Olethreutine moths of the midwestern United States, an identification guide. Ohio Biological Survey, Columbus, Ohio. 334 pp.

Gilligan, T. M. and M. E. Epstein. 2011. The European grape vine moth not found in California: *Eupoecilia ambiguella* (Hübner), pp. 32-34. In Plant Pest Diagnostics Center Annual Report 2010. California Department of Agriculture, Sacaramento, CA.

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