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TORTRICIDAE - *Cydia*

Taxonomy

Tortricoidea: Tortricidae: Olethreutinae: Grapholitini: *Cydia*

Synonyms: *Carpocapsa*, *Laspeyresia*, *Melissopus*, many others

Larval diagnosis (Summary)

- D1 and SD1 on the same pinaculum on A9
- L group on T1 does not extend beneath the spiracle
- Anal comb absent
- Borers in fruit, nuts, cones, and pods

Host/origin information

Because *Cydia* is a cosmopolitan genus, larvae can originate from most any country or continent. The following are the most frequent origin/host combinations:

Origin	Host(s)
Asia	*Castanea*
Europe	*Castanea*
Armenia	*Malus*, *Prunus*
Brazil	*Araucaria*
Mexico	*Cydonia*, *Malus*, *Prunus*, *Pyrus*, *Quercus*

Recorded distribution

Cydia is a worldwide genus that is found on every continent except Antarctica.

Identification authority (Summary)

Identifications of *Cydia* should be restricted to internal-feeding tortricid larvae that possess all three of the following characters: D1 and SD1 on the same pinaculum on A9; L group on T1 not extending beneath the spiracle; and anal comb absent. Larvae in other genera may have similar morphology; see the Detailed Information tab for further discussion.

Pest characterization

(Based on Cavey 2001, Gilligan and Epstein 2012)

- Taxonomy: **High.** Identification to genus is usually possible.
- Distribution: **High/Low.** Some *Cydia* are present in the U.S.; however, some important pest species are not.
- Potential Impact: **High.** Many *Cydia* are important pests.

This ranking characterizes *Cydia* as quarantine significant for the U.S. in some instances and not quarantine significant in other instances. The actual ranking for an intercept will depend on the species involved.

Larval diagnosis (Detailed)

Cydia is a worldwide genus that is found on every continent except Antarctica (Gilligan and Epstein 2012). *Cydia* contains approximately 200 described species (Gilligan et al. 2012) and includes many pest species, such as the codling moth, which is the most widely distributed and important pest of apple, pear, and walnuts in the world. *Cydia* larvae are the most frequently intercepted tortricids at U.S. ports of entry and most interceptions are on Fabaceae, Fagaceae, Pinaceae, or Rosaceae from Asia, Europe, or Mexico. Larvae are whitish to reddish and resemble those of other internal-feeding olethreutines.


Fig. 1: *Cydia pomonella*, lateral view


Fig. 2: *Cydia splendana*, lateral view


Fig. 3: *Cydia pomonella*, dorsal view


Fig. 4: L group on T1


Fig. 5: A9 and A10

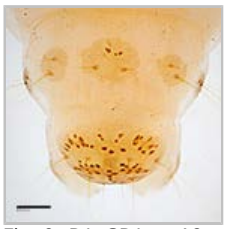


Fig. 6: D1, SD1 on A9


Fig. 7: D1, SD1 on A9


Fig. 8: Head


Fig. 9: Mandible

Brown (2011) divided intercepted tortricid larvae into four "types." "*Cydia* type" larvae are characterized by: D1 and SD1 on the same pinaculum on A9; L group on T1 not extending beneath the spiracle; and anal comb absent. It is difficult to provide a more specific larval diagnosis for the genus given the morphological variability within the group. MacKay (1959) treated the genus in at least eight different groups (*Carpocapsa* Groups 1-2, *Laspyresia* Group 1-5, and *Melissopus*), with most species grouped by host preference, and she included species in other genera (*Grapholita*). Other authors (e.g., Brown 1987) have also grouped *Cydia* by the specific commodity on which they feed. We follow suit here and provide a discussion of various intercepted species grouped by host and a short section on other morphologically similar species.

Castanea-feeders

Castanea-feeding *Cydia* are the most frequently intercepted tortricid species. This group includes four *Cydia* (two from Europe and two from Asia): *C. splendana*, *C. fagiglandana*, *C. glandicolana*, and *C. kurokoi*. Two other commonly intercepted tortricids on *Castanea* include *Pammene fasciana* and *Fibuloides* (= *Eucoenogenes*) *aestuosa*. See the *Cydia splendana* Fact Sheet for a detailed discussion of larval morphology within this group.

Conifer-feeders

Several conifer-feeding *Cydia* are intercepted at ports of entry. This list includes: *C. araucariae*, *C. strobilella*, and likely members of the *C. toreuta* complex.

Larvae of *Cydia araucariae* are found in the seeds of Brazilian pine (Araucariaceae: *Araucaria angustifolia*) imported from Brazil, Argentina, and possibly Chile. Although host/origin is likley sufficient to identify this species, other larval characters from Brown (2011) include: body sometimes pinkish with medium large, pale brown pinacula; prothoracic shield light brown, anal shield dark brown; L pinaculum of T1 rather large, sometimes notched distally; L setae of A9 sometimes all on the same pinacula; SV group 3:3:2(3):1(2):1; number of crochets on abdominal prolegs 34-37. Pastrana (1961) described the larva and pupa.

Cydia strobilella is a pest of spruce in the Palearctic. It ranges from Europe to China and Japan and it is also present in the northern U.S. and Canada. Larvae are usually intercepted on spruce (Pinaceae: *Picea*) cones imported from Europe. No species-level larval characters are listed by Brown (2011), and the host/origin association is enough to provide an identification.

Unidentified *Cydia* larvae are frequently intercepted on a variety of hosts from Mexico. Some of these larvae likely belong to the *Cydia toreuta* complex of species. Larvae from this group feed in the cones of various *Pinus* species, and several species (both described and undescribed) are present in Mexico. For additional information on this group see Miller (1959, 1966), Abrahamson and Kraft (1965), and Heinrich (1926). Cibrian-Tovar et al. (1995) illustrated many forest pests of Mexico in color. Other *Cydia* species intercepted from Mexico include *C. latiferreana*, which feeds on oak (*Quercus*) and *C. deshaisiana*, the Mexican jumping bean moth (see below).

Euphorbiaceae-feeders

Cydia deshaisiana, the Mexican jumping bean moth, is a native of Mexico and is found in the northern states of Sinoloa and Sonora. Mexican jumping beans are frequently imported into the U.S., occasionally in large numbers. Several websites are available that supply the "beans," complete with live larvae, on a commercial scale (such sites include http://www.jbean.com and http://www.jumpingbeansrus.com). The "beans" are actually seeds of various Euphorbiaceae, including *Croton*, *Sapium*, and *Sebastiania*. Larvae feeding inside the seeds are able to move or "jump" the seeds, or "beans," by rapid twitching; this behavior is triggered by temperature and may be a mechanism to move the seed to a more favorable location (such as out of direct sunlight). Tortricid larvae within Euphorbiaceae seeds from Mexico are easily identified as *C. deshaisiana* (Gilligan et al. 2012). Note that many records in PestID are listed under a synonym (*C. saltitans*). The larva was illustrated in color by Wagner (2005).

Fabaceae-feeders

Several species of *Cydia* feed on beans (Fabaceae). Some of these include *C. fabivora* (now *Ecdytolopha fabivora*), *C. torostoma*, and *C. nigricana*. The last two species have never been reported in PestID and are not treated here. Razowski (2011) moved *fabivora* into *Ecdytolopha*, although this species is still placed in *Cydia* in most publications and databases. Larvae of *E. fabivora* are occasionally intercepted on *Phaseolus* or *Glycine max* from Mexico, Central America, South America, and the Caribbean. Larval damage to beans is similar to that caused by *Crocidosema aporema*; however, larvae of *C. aporema* feed primarily on young leaflets while those of *E. fabivora* feed in the stems and pods; see the *Crocidosema aporema* Fact Sheet for more information that species. Larvae of *E. fabivora* are similar to many other species in the *Cryptophlebia-Ecdytolopha* group, with an enlarged L-pinaculum on the prothorax that extends beneath (and usually beyond) the spiracle; this character state is not present in *Cydia* larvae.

Rosaceae-feeders

Many of the best known tortricid species are pests of stone or pome fruit in the family Rosaceae. Internal feeders in this group include many *Cydia* and *Grapholita* species. Larvae of these two genera are similar in appearance but can usually be separated by the anal comb, which is present in many *Grapholita* and absent in most *Cydia*. The most important *Cydia* pest is *C. pomonella*, which is found on apple, pear, walnut, almond, apricot, fig, macadamia, nectarine, peach, plum, prune, quince, and a variety of other hosts. See the *Cydia pomonella* Fact Sheet for detailed information on that species.

Non-*Cydia* species

Several other species are included in Brown's (2011) "*Cydia*-type" group. These species all have D1 and SD1 on the same pinaculum on A9, the L group on T1 does not extend beneath the spiracle, and an anal comb is absent. *Talponia batesi* is frequently intercepted on cherimoya (Annonaceae: *Annona*) from Mexico, Central America, or the Caribbean. Larvae of *T. batesi* are easily separated from those of *Cydia* by the following characters: D1, D2, and SD1 setae on A9 all on same enlarged (ill-defined) pinaculum; integument conspicuously spiny; crochets on abdominal prolegs 16-19. *Tetramoera schistaceana* is occasionally intercepted on sugarcane (*Saccharum officinarum*) from Asia. Host and origin is sufficient to separate larvae of this species from those of *Cydia*. In addition to several *Cydia* species, *Pammene fasciana* and *Fibuloides aestuosa* are intercepted on *Castanea* from Europe and Asia. See the *Cydia splendana* Fact Sheet for a detailed discussion of larval morphology within this group.

Identification authority (Detailed)

Identifications of *Cydia* should be restricted to internal-feeding tortricid larvae that possess all three of the following characters: D1 and SD1 on the same pinaculum on A9; L group on T1 not extending beneath the spiracle; and anal comb absent. Larvae in other genera may have similar morphology, and the most commonly intercepted species with this set of characters that are NOT *Cydia* include: *T. batesi* (on *Annona* from Mexico, Central America, or the Caribbean), *T. schistaceana* (on *Saccharum* from Asia), *P. fasciana* (on *Castanea* from Europe), and *F. aestuosa* (on *Castanea* from Asia). Other similar species include many *Grapholita*, but all of the major *Grapholita* pests have an anal comb.

Key to larval Tortricidae intercepted, or potentially encountered, at U.S. ports of entry

Origin records

Cydia have been intercepted from the following locations:

Afghanistan, Albania, Algeria, Argentina, Armenia, Australia, Austria, Azerbaijan, Azores, Bangladesh, Belgium, Bolivia, Bosnia and Herzegovina, Brazil, Bulgaria, Cambodia, Canada, Chile, China, Colombia, Costa Rica, Croatia, Cyprus, Czech Republic, Denmark, Ecuador, Egypt, El Salvador, Estonia, France, Georgia, Germany, Greece, Guatemala, Haiti, Hong Kong, Hungary, India, Iran, Iraq, Israel, Italy, Jamaica, Japan, Jordan, Kazakhstan, Kuwait (?), Kyrgyzstan, Lebanon, Lithuania, Macedonia, Malaysia, Mali, Mexico, Moldova, Montenegro, Morocco, Netherlands, New Zealand, Nigeria, North Korea, Palestinian Territory, Panama, Peru, Philippines, Poland, Portugal, Romania, Russia, Senegal, Serbia, Serbia and Montenegro, Singapore, Slovakia, Slovenia, Somalia, South Africa, South Korea, Spain, Sweden, Switzerland, Syrian Arab Republic, Taiwan, Turkey, Ukraine, United Arab Emirates, United Kingdom of Great Britain and N. Ireland, Uzbekistan, Viet Nam, Yugoslavia

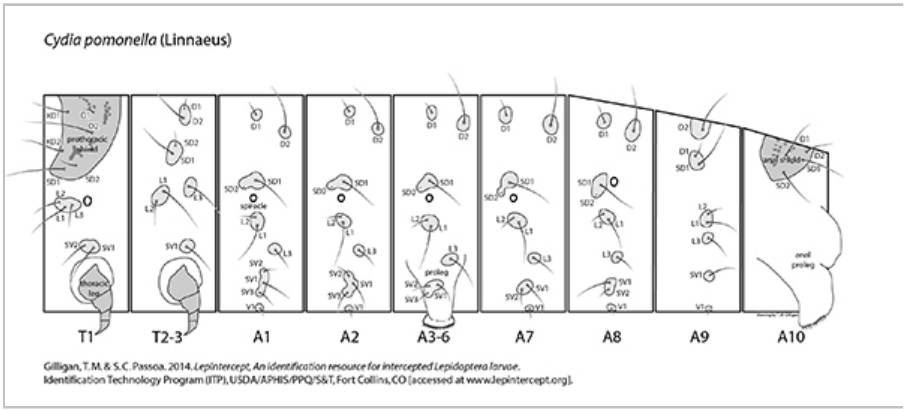
Host records

Cydia have been intercepted on the following hosts:

Acer sp., *Acer tataricum*, *Aesculus* sp., *Allium* sp., *Alstroemeria* sp., *Araucaria angustifolia*, *Araucaria araucana*, *Araucaria* sp., *Arctostaphylos manzanita*, Asteraceae, *Bertholletia excelsa*, *Capsicum* sp., *Carya illinoinensis*, *Carya* sp., *Castanea crenata*, *Castanea dentata*, *Castanea mollissima*, *Castanea pumila*, *Castanea sativa*, *Castanea* sp., *Chamaedorea* sp., *Chamelaucium* sp., *Citrus sinensis*, *Citrus* sp., *Coccoloba uvifera*, *Corylus* sp., *Crataegus laevigata*, *Crataegus monogyna*, *Crataegus pinnatifida*, *Cucurbita* sp., *Cyamopsis tetragonoloba*, *Cydonia oblonga*, *Eleocharis* sp., *Erythrina berteroana*, *Erythrina* sp., *Fagus* sp., *Ficus carica*, *Ficus* sp., *Inga edulis*, *Inga laurina*, *Inga* sp., *Juglans regia*, *Juglans* sp., *Juncus* sp., *Malus domestica*, *Malus* sp., *Malus sylvestris*, *Mangifera indica*, *Manilkara zapota*, *Mentha* sp., *Mespilus* sp., *Momordica charantia*, *Musa* sp., *Ocimum basilicum*, *Opuntia* sp., *Opuntia tuna*, *Pachira* sp., *Pandanus* sp., *Phaseolus* sp., *Phaseolus vulgaris*, *Phoenix* sp., *Physalis* sp., *Picea abies*, Pinaceae, *Pinus edulis*, *Pinus* sp., *Pisum sativum*, *Pithecellobium dulce*, *Prosopis* sp., *Protea* sp., *Prunus americana*, *Prunus armeniaca*, *Prunus domestica*, *Prunus dulcis*, *Prunus mume*, *Prunus persica*, *Prunus* sp., *Psidium guajava*, *Psidium* sp., *Punica granatum*, *Punica* sp., *Pyrus bretschneideri*, *Pyrus communis*, *Pyrus pyrifolia*, *Pyrus* sp., *Quercus coccifera*, *Quercus* sp., *Ribes* sp., *Salvia officinalis*, *Salvia* sp., *Solanum melongena*, *Solanum tuberosum*, *Trifolium* sp., *Triticum aestivum*, *Tropaeolum majus*, *Vicia faba*, *Zea mays*

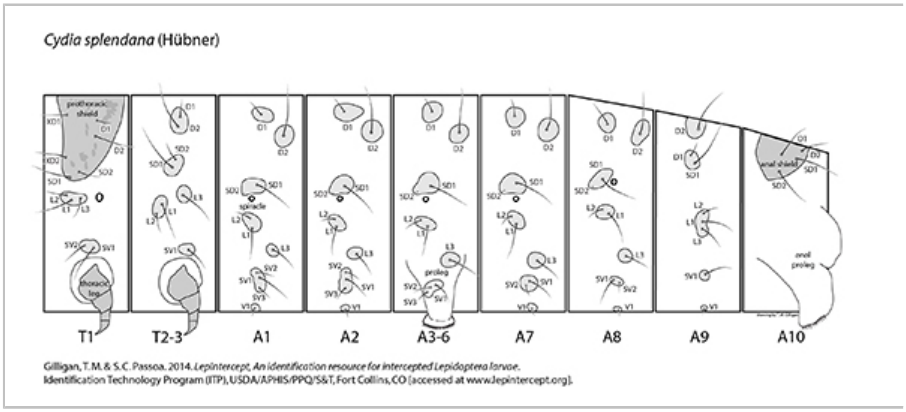
Lily, corn, *Opuntia*, and seagrape are especially suspect records in need of confirmation.

Setal map



Cydia pomonella setal map

Click here to download a full-size printable PDF of this larval setal map



Cydia splendana setal map

Click here to download a full-size printable PDF of this larval setal map