County of Los Angeles

Department of Agricultural Commissioner/Weights and Measures

Field Guide to Target Insects in California Pest Detection Programs

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- 2017 -

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Contents

Introduction

Pest detection is an important step in the pest prevention program. Accurate recognition of newly introduced, economically significant insects in the field enables the prompt implementation of steps to effectively and efficiently confine and eradicate new infestations to prevent establishment and subsequent spread of these pests to agricultural, urban and natural environments.

This field guide is prepared primarily as a reference manual for agricultural inspectors working in insect detection trapping and eradication programs in California. It may also be helpful for quarantine inspectors intercepting shipments of plant material entering California through various ports of entry.

Not all insects placed on the detection program trapping target list were possible to include in this work. We were often limited by the absence of fresh specimens, with well preserved colors and intact body parts, important for obtaining realistic images comparable with wild specimens in the field. This guide will be periodically updated as mentioned specimens become available. In the current edition, we have presented some non-target, frequently trapped fruit fly species that belong to the same genera of *Tephritidae* as the fruit flies on the state detection target list. Field identification and separation of these closely related and often similar appearing species is essential.

It is important to remember that this guide is solely for initial recognition of target pests in the field. All suspect specimens must be subsequently submitted to appropriate state/county entomology laboratories for final identification.

The supplemental part of this work, located at the end of the guide, was added to encompass some important exotic species that are not on the pest trapping list, but can possibly be encountered during detection work in the field.

Diagnostic characters used in this work are selected to help recognize target insects in the field with 16-20X magnification lens. All measurements are given in millimeters (mm). Please use the ruler provided below as a reference.

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All users of this guide are invited to submit their suggestions to the author at:
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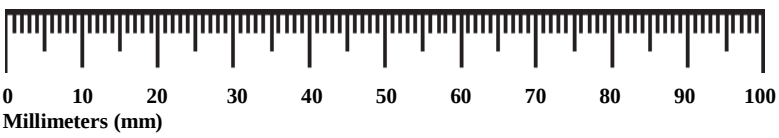


Pest Ratings

The following pest ratings are established by California Department of Food and Agriculture (CDFA) to reflect the importance of various organisms or disorders to the agricultural, horticultural, environmental, and public health interests of California, under the authority of California Code of Regulations Title 3, Division 4, Chapter 3, Article 2, Section 3162.

"A" A pest of known economic or environmental detriment and is either not known to be established in California or it is present in a limited distribution that allows for the possibility of eradication or successful containment.

A-rated pests are prohibited from entering the state because, by virtue of their rating, they have been placed on the Plant Health and Pest Prevention Services Director's list of organisms "detrimental to agriculture" in accordance with the FAC Sections 5261 and 6461. The only exception is for organisms accompanied by an approved CDFA or USDA live organism permit for contained exhibit or research purposes.

If found entering or established in the state, A-rated pests are subject to state (or commissioner when acting as a state agent) enforced action involving eradication, quarantine regulation, containment, rejection, or other holding action.

"B" A pest of known economic or environmental detriment and, if present in California, it is of limited distribution.

B-rated pests are eligible to enter the state if the receiving county has agreed to accept them. If found in the state, they are subject to state endorsed holding action and eradication only to provide for containment, as when found in a nursery. At the discretion of the individual county agricultural commissioner they are subject to eradication, containment, suppression, control, or other holding action.

"C" A pest of known economic or environmental detriment and, if present in California, it is usually widespread.

C-rated organisms are eligible to enter the state as long as the commodities with which they are associated conform to pest cleanliness standards when found in nursery stock shipments. If found in the state, they are subject to regulations designed to retard spread or to suppress at the discretion of the individual county agricultural commissioner. There is no state enforced action other than providing for pest cleanliness.

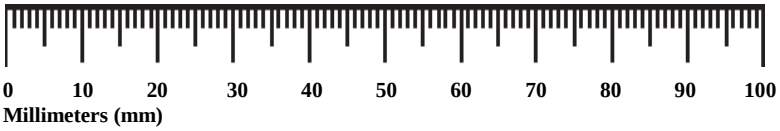
"Q" An organism or disorder suspected to be of economic or environmental detriment, but whose status is uncertain because of incomplete identification or inadequate information.

Temporary "A" action is required pending determination of a permanent rating. However, in the case of an established infestation and in the absence of evidence that the pest might qualify as A-rated, at the discretion of the Director the state may only be required to conduct surveys and to retard or prevent spread prior to assignment of a permanent rating of B, C, or D.

"D" An organism known to be of little or no economic or environmental detriment, to have an extremely low likelihood of weediness, or is known to be a parasite or predator. There is no state enforced action.

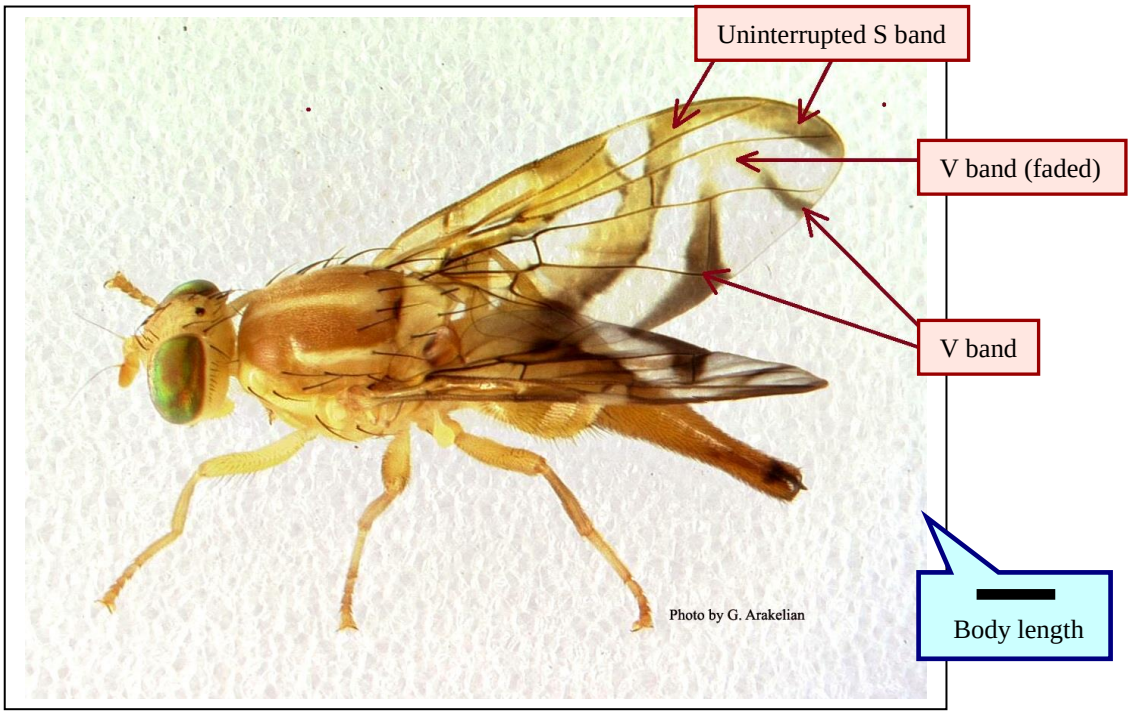
Order: *Diptera*

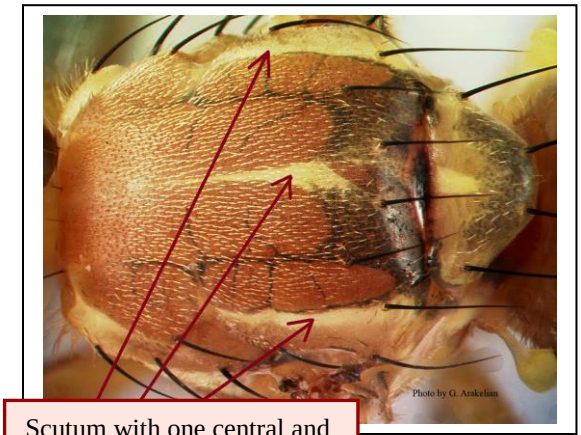
Family: *Tephritidae*

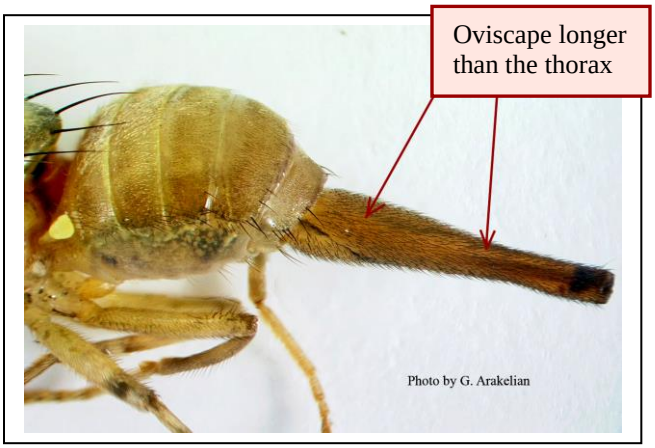


Anastrepha ludens Mexican fruit fly

Distribution and Rating: Widely distributed from Costa Rica to southern USA (Texas). Rated A.
Hosts and Damage: Mexican fruit fly has been recorded from more than 50 plant species, including apple, avocado, cherimoya, citrus, coffee, guava, mango, papaya, peach, pear, persimmon, pomegranate, quince, and sapote.
Trap/Attractant: McPhail trap with yeast pellets (general feeding response).
Field ID: *A. ludens* is slightly larger than a housefly. It has yellowish-orange scutum with one central and two lateral yellow stripes. Wings with yellow-brown bands which are often darker at their edges. S band is uninterrupted and V band is gradually faded in anterior section. Abdomen is yellow to orange. Females with relatively long oviscape (longer than the thorax). Larvae (maggots) are legless, creamy white with cylindrical bodies narrowed at the anterior end. They develop inside the fruit and later move into the soil to pupate.

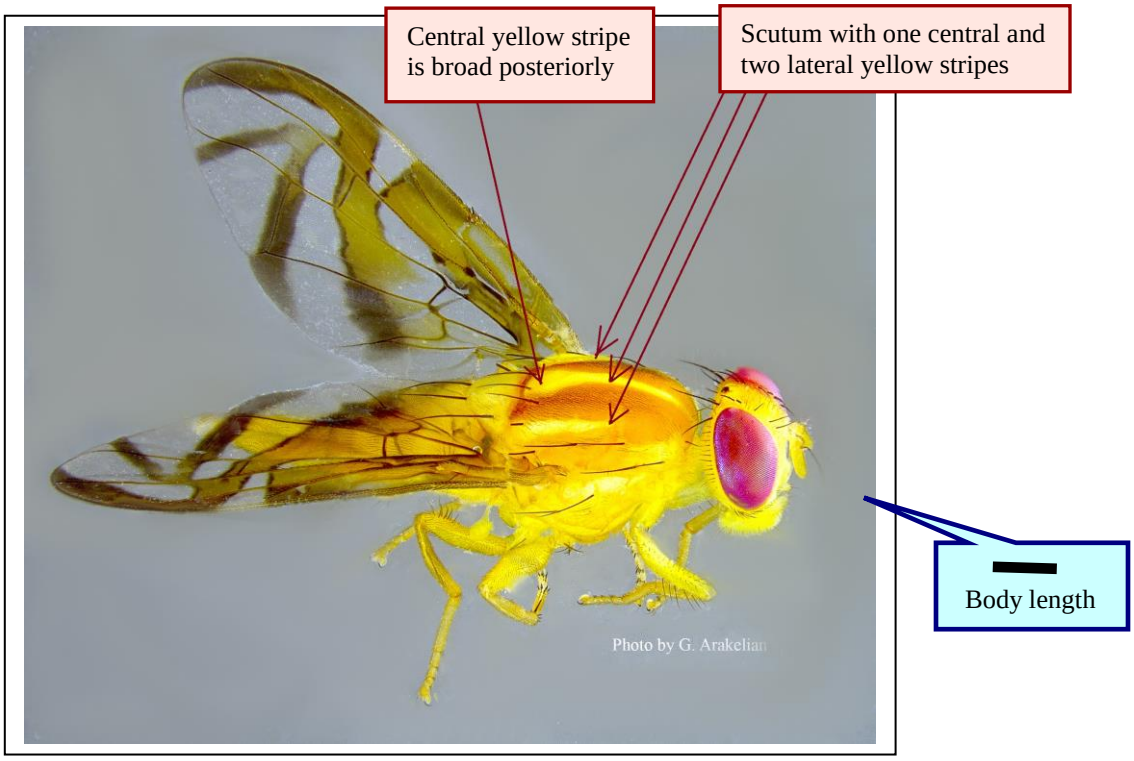


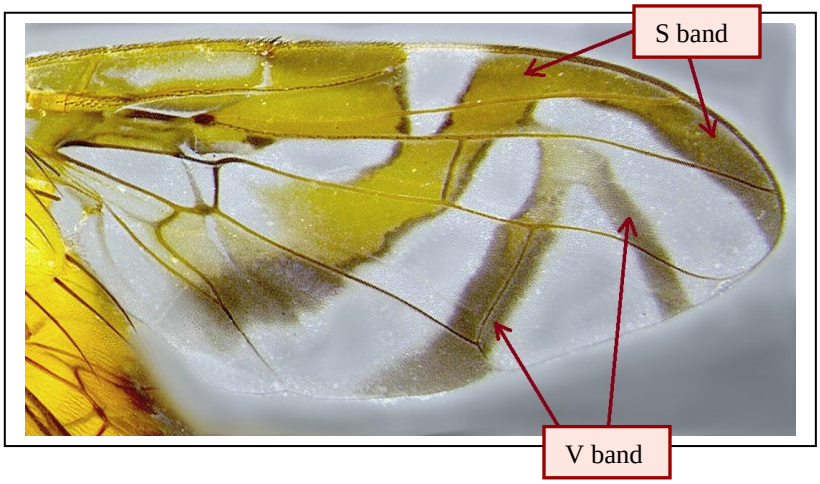




Anastrepha obliqua West Indian fruit fly

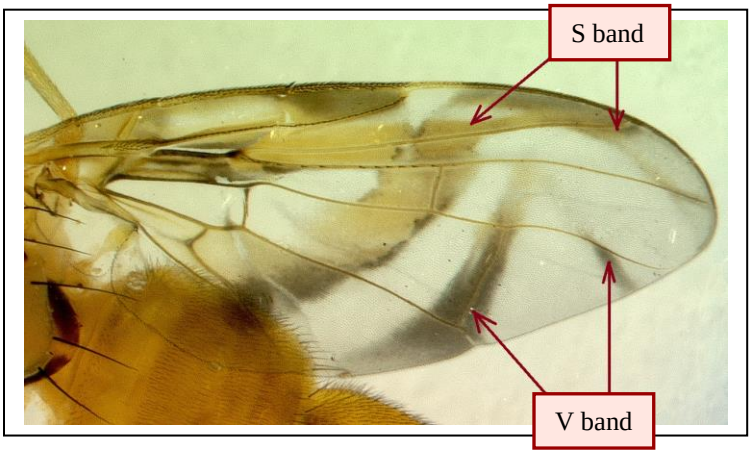
Distribution and Rating: South and Central America, West Indies and nearby islands. Rated A.
Hosts and Damage: Known to attack more than 60 different plant species, including mango, guava, rose apple, almond, loquat, sapote, citrus, etc. Larvae (maggots) feed inside the fruit, making it unfit for consumption.
Trap/Attractant: McPhail trap with yeast pellets (general feeding response).
Field ID: West Indian fruit fly is slightly larger than a housefly. Scutum is yellow-orange with one central and two lateral stripes (vittae). The central stripe is broad posteriorly. Wings with yellow-brown bands. S band is joined (often broadly) to V band. Larvae (maggots) are white to creamy white, legless with cylindrical bodies narrowed at the anterior end. After developing inside the fruit, they enter the soil to pupate.

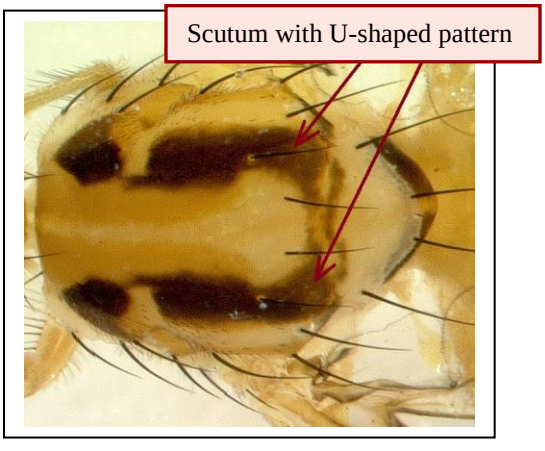




Anastrepha striata New World guava fruit fly

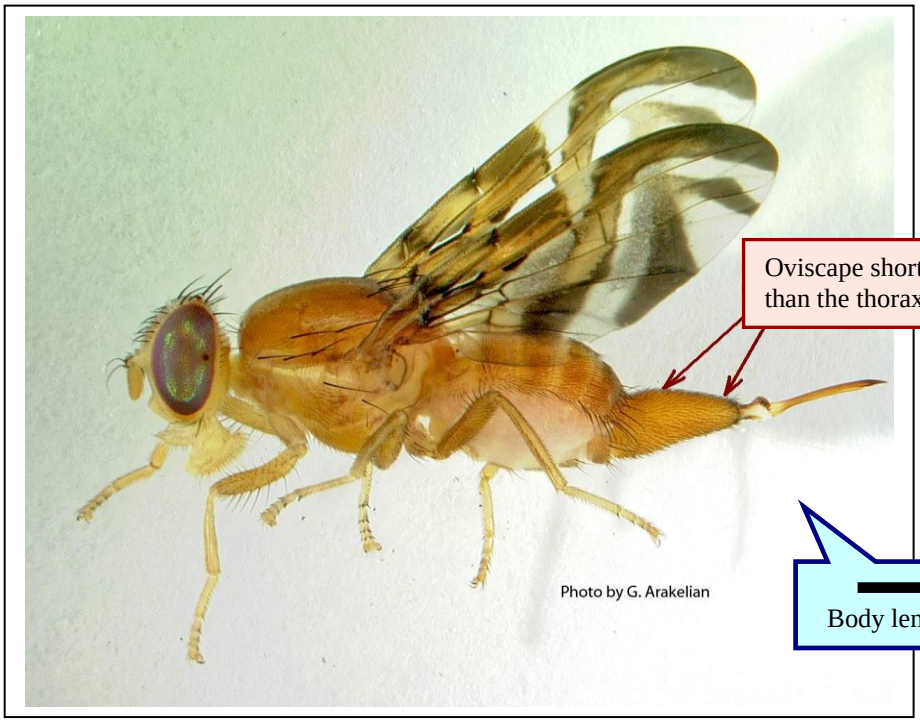
Distribution and Rating: Widespread in Central and South America. Rated A.
Hosts and Damage: Preferred host is guava. Found also attacking avocado, cassava, mango, peach, sapote, soursop, sweet orange, and others. Larvae feed inside the fruit making it unfit for consumption.
Trap/Attractant: McPhail trap with yeast pellets (general feeding response).
Field ID: *A. striata* is slightly larger than a housefly. It has yellowish-orange body. Scutum with broad dark brown stripes connected on posterior margin and forming a U-shaped pattern. Wings with brown and yellow bands. V band on the wing is not joined to S band. Larvae (maggots) are legless, creamy white with cylindrical bodies narrowed at the anterior end. They develop inside the fruit and later move into the soil to pupate.

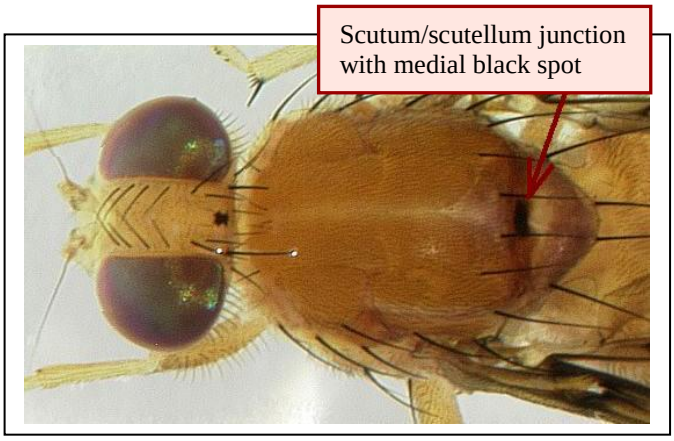


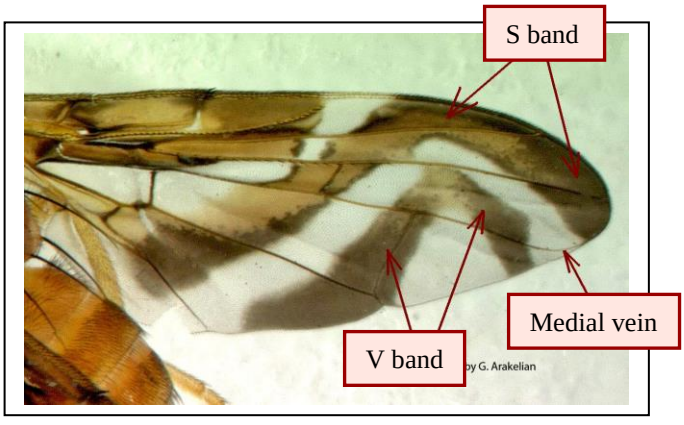


Anastrepha suspensa Caribbean fruit fly

Distribution and Rating: Bahamas, Cuba, Dominican Republic, Haiti, Jamaica, and Puerto Rico. In the U.S.: Florida. Rated A.
Hosts and Damage: Caribbean fruit fly has been recorded from many plant species, including avocado, citrus, guava, loquat, mango, nectarine, peach, pear, persimmon, and pomegranate.
Trap/Attractant: McPhail trap with yeast pellets (general feeding response).
Field ID: Caribbean fruit fly is slightly larger than a housefly. It has yellowish-orange body and wings with brownish-yellow to brown bands. The junction of scutum and scutellum bears a distinct medial black spot. S band has a broad apical part touching medial vein. V band is usually narrowly joined to S band. Females with oviscape that is shorter than the thorax. Larvae (maggots) are legless, creamy white with cylindrical bodies narrowed at the anterior end. They develop inside the fruit and later move into the soil to pupate.

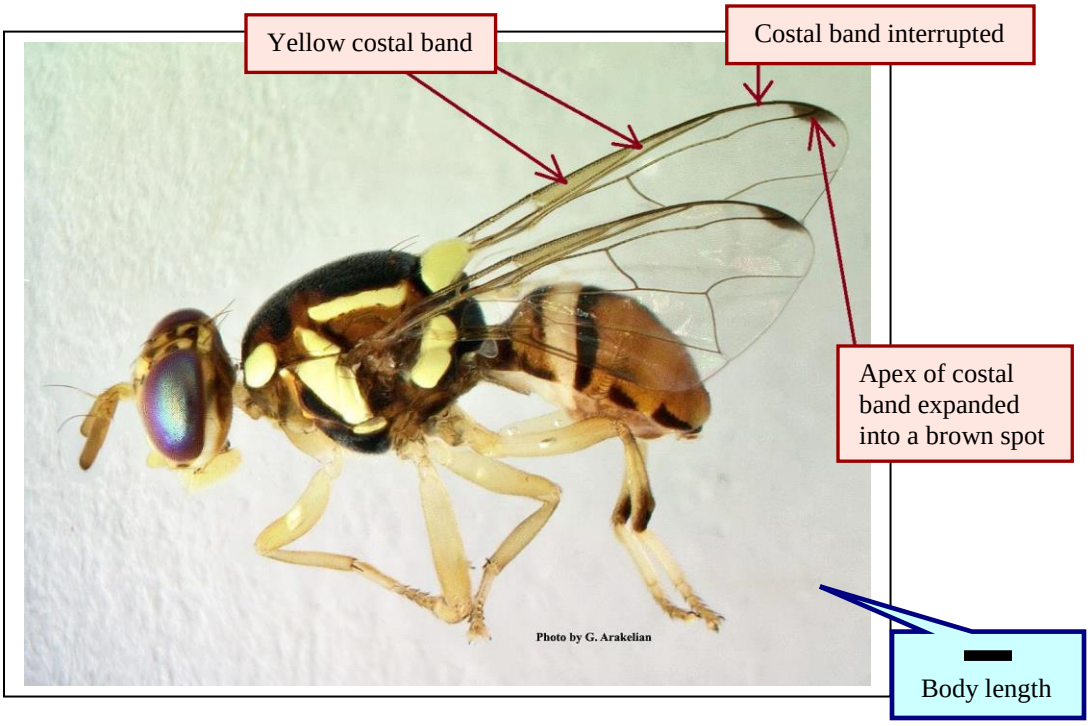


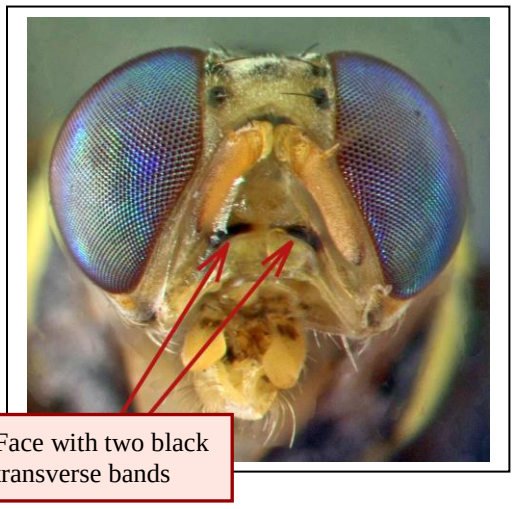


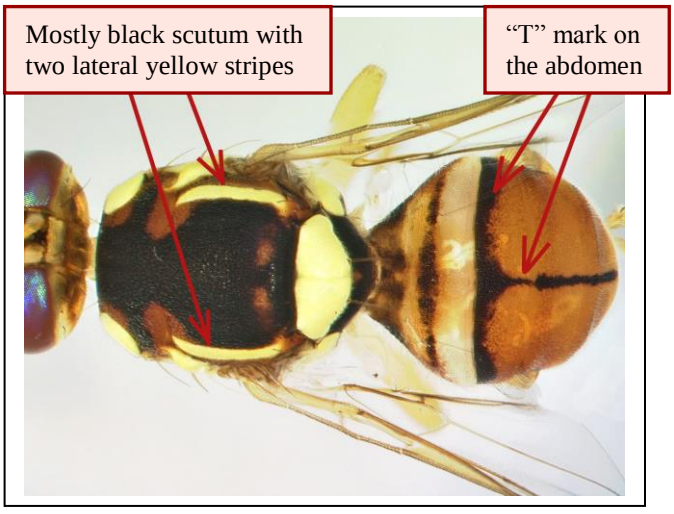


Bactrocera correcta Guava fruit fly

Distribution and Rating: Occurs in China, India, Myanmar, Nepal, Pakistan, Sri Lanka, and Thailand. Rated A.
Hosts and Damage: Known to attack apple, citrus, fig, guava, jujube, mango, peach, roseapple, sapodilla, etc. Larvae (maggots) feed inside the fruit, making it unfit for consumption.
Trap/Attractant: Jackson trap with methyl eugenol (primarily as a male attractant) and McPhail trap with yeast pellets (general feeding response).
Field ID: Guava fruit fly is slightly larger than a housefly. It has two black transverse bands on its face and a predominately black scutum with two yellow lateral stripes. Yellow costal band on the wing is interrupted and expanded at apex into a brown spot. Abdomen yellow to orange-yellow with a black "T" mark on dorsal surface. Larvae (maggots) are white to creamy white, legless with cylindrical bodies narrowed at the anterior end. After developing inside the fruit they enter the soil to pupate.

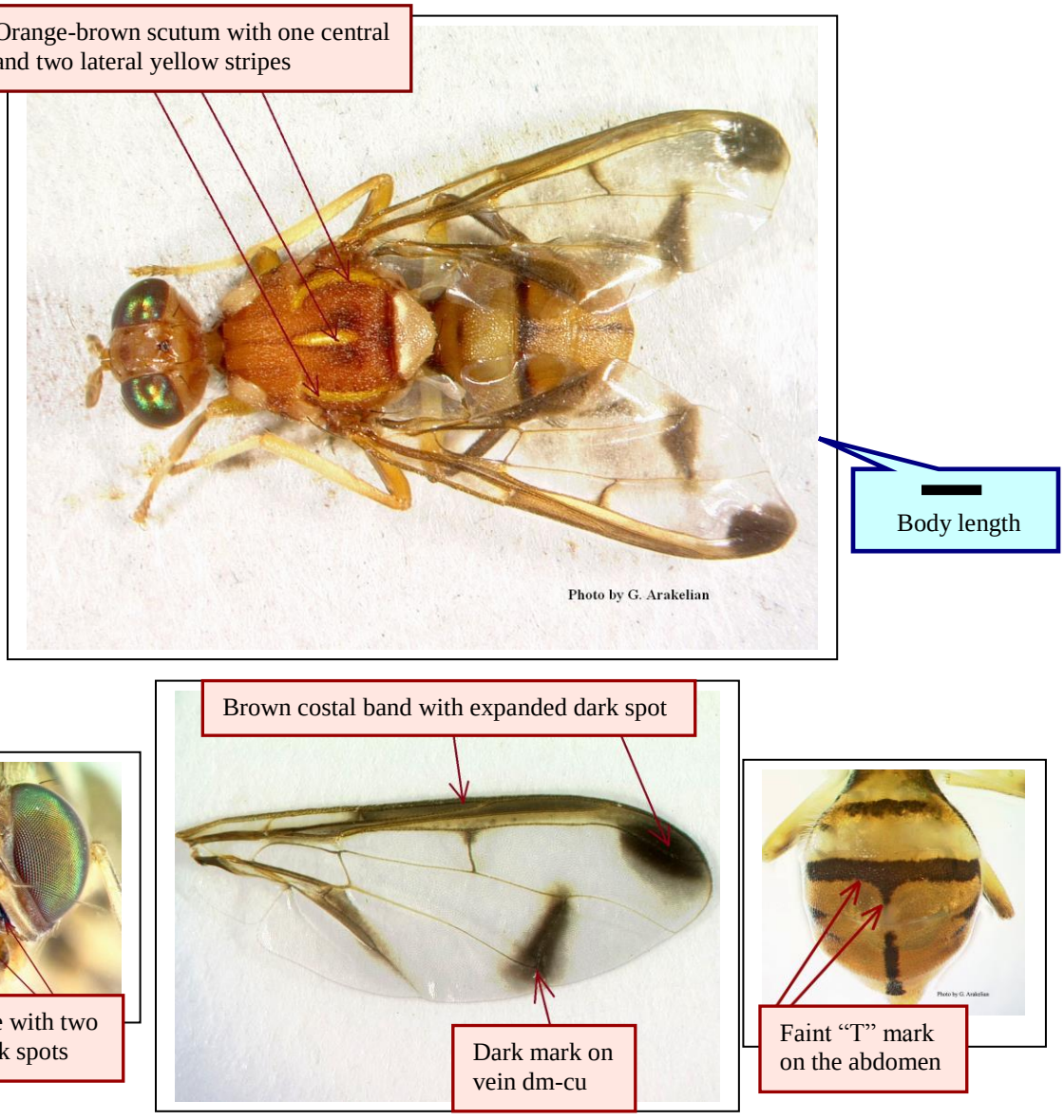






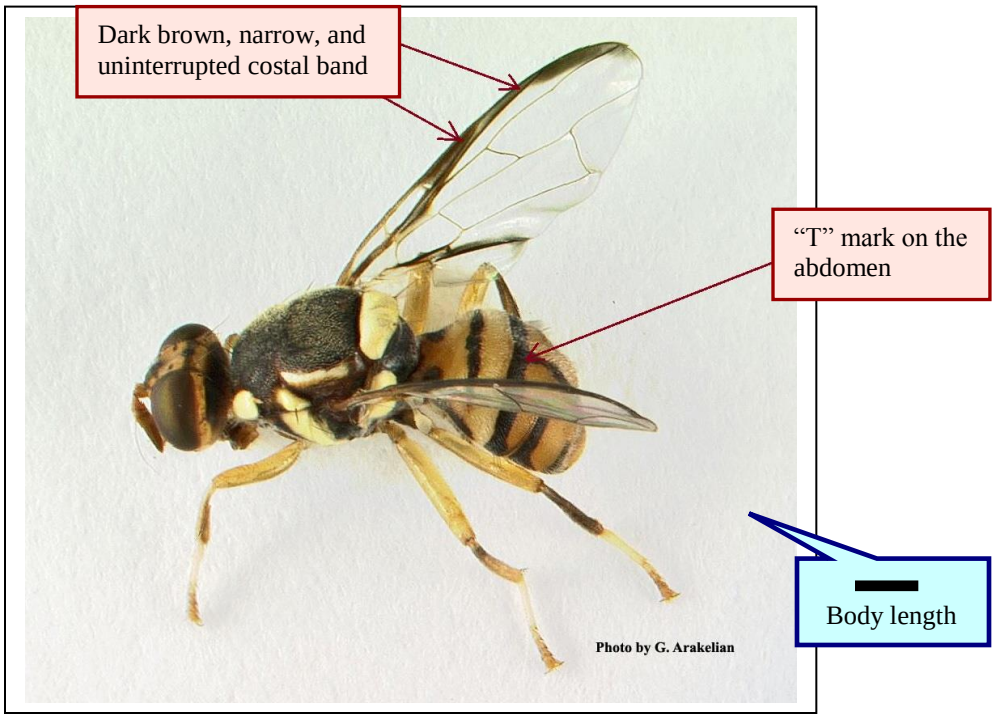
Bactrocera cucurbitae Melon fruit fly

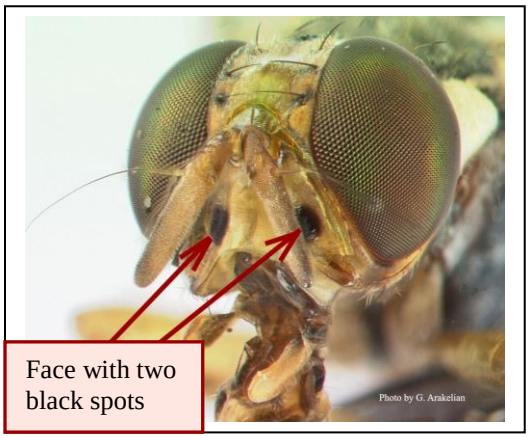
Distribution and Rating: Widely distributed in the Oriental region and neighboring islands. Found also in East Africa, Mauritius, Reunion, Iran, and Hawaii. Rated A.
Hosts and Damage: Melon fruit fly damage has been recorded on over 125 plant species. A serious pest of *Cucurbitaceae*, it may also attack avocado, fig, quince, mango, papaya, tomato, pepper, etc.
Trap/Attractant: Jackson trap with Cue-lure (male sexual attractant) and McPhail trap with yeast pellets (general feeding response).
Field ID: *B. cucurbitae* is slightly larger than a housefly. It has an orange-brown scutum with one central and two lateral yellow stripes. The face bears two black spots. Abdomen with faint black 'T" mark on dorsal surface. Brown costal band is expanded near the apex of the wing into a prominent dark spot. Vein dm-cu with a dark mark covering it. Larvae (maggots) are creamy white, legless with cylindrical bodies narrowed at the anterior end. They develop inside the fruit, flowers, and stems of host plants and enter the soil to pupate.

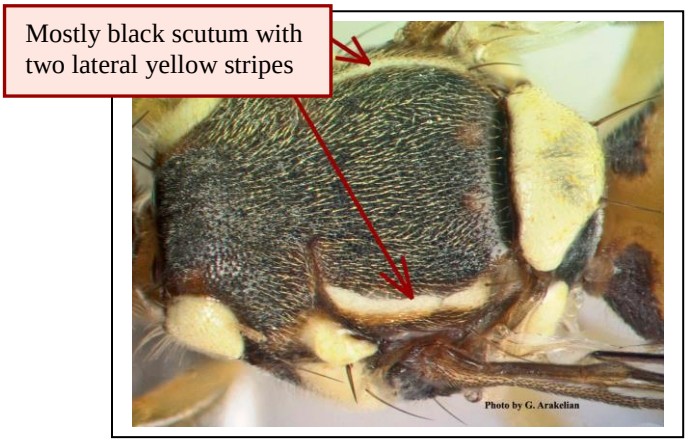


Bactrocera dorsalis Oriental fruit fly

Distribution and Rating: Widely distributed in the Oriental region. Found also in Hawaii and Micronesia. Rated A.
Hosts and Damage: Oriental fruit fly has been recorded from more than 230 plant species, including almond, apple, apricot, avocado, banana, cherry, citrus, coffee, fig, guava, loquat, mango, papaya, peach, pear, pepper, persimmon, pineapple, squash and tomato.
Trap/Attractant: Jackson trap with methyl eugenol (primarily as a male attractant) and McPhail trap with yeast pellets (general feeding response).
Field ID: *B. dorsalis* is slightly larger than a housefly. It has a mostly black scutum with two yellow lateral stripes. The face bears two black spots. Dark brown costal band on the wing is narrow and uninterrupted. Abdomen yellow to orange with a black "T" mark on dorsal surface. Larvae (maggots) are legless, creamy white with cylindrical bodies narrowed at the anterior end. They develop inside the fruit and later move into the soil to pupate.

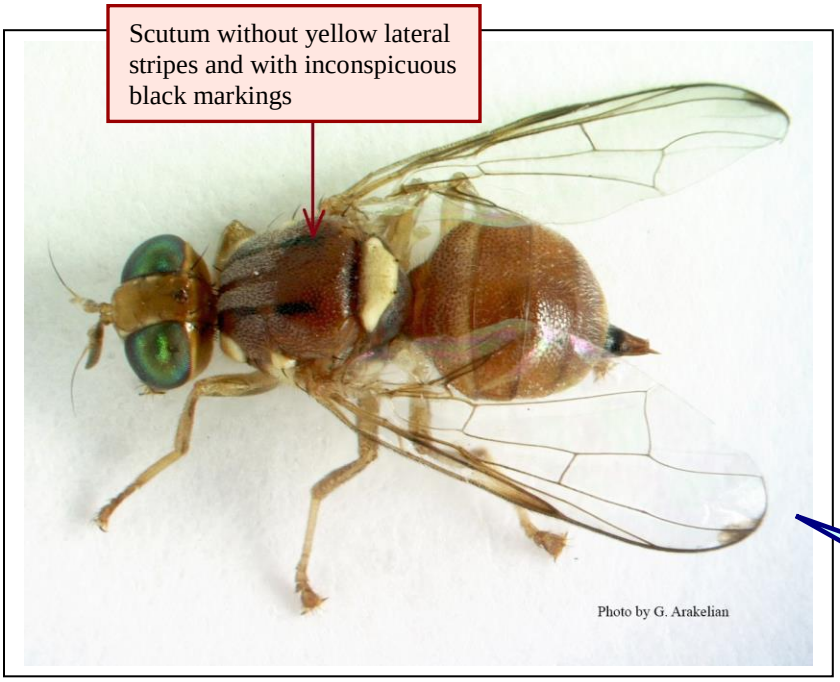


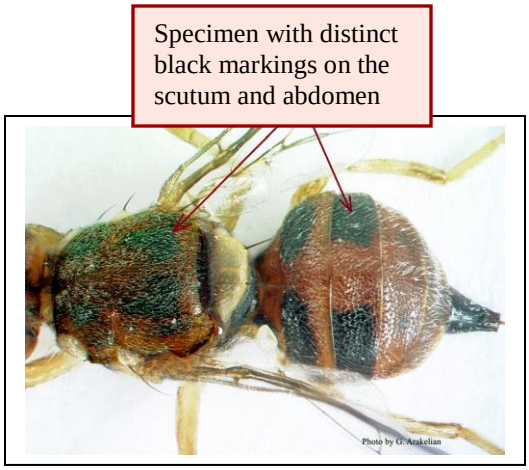


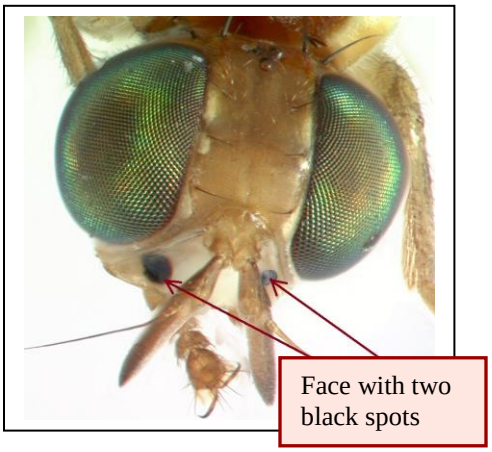


Bactrocera oleae Olive fruit fly

Distribution and Rating: Southern Europe, Africa, Middle East, China, India, Pakistan, Mexico and Central America. In the U.S.: California. Rated C.
Hosts and Damage: Attacks olives. Larvae (maggots) develop inside the fruit making it unfit for consumption.
Trap/Attractant: Occasionally trapped in McPhail traps with yeast pellets (general feeding response) deployed for other exotic fruit flies.
Field ID: *B. oleae* is about the size of a housefly. Scutum without yellow lateral stripes. Its color varies from mainly black to dark reddish-brown (with some inconspicuous black markings). Color of the abdomen also variable. Predominantly yellowish-orange it may have some black markings on its dorsal surface. The face bears two black spots. Wing pattern is reduced. A black spot is present at the apex of the wing. Larvae (maggots) are legless, creamy white with cylindrical bodies narrowed at the anterior end. They develop inside the fruit. May pupate in olives or move into the soil to pupate.

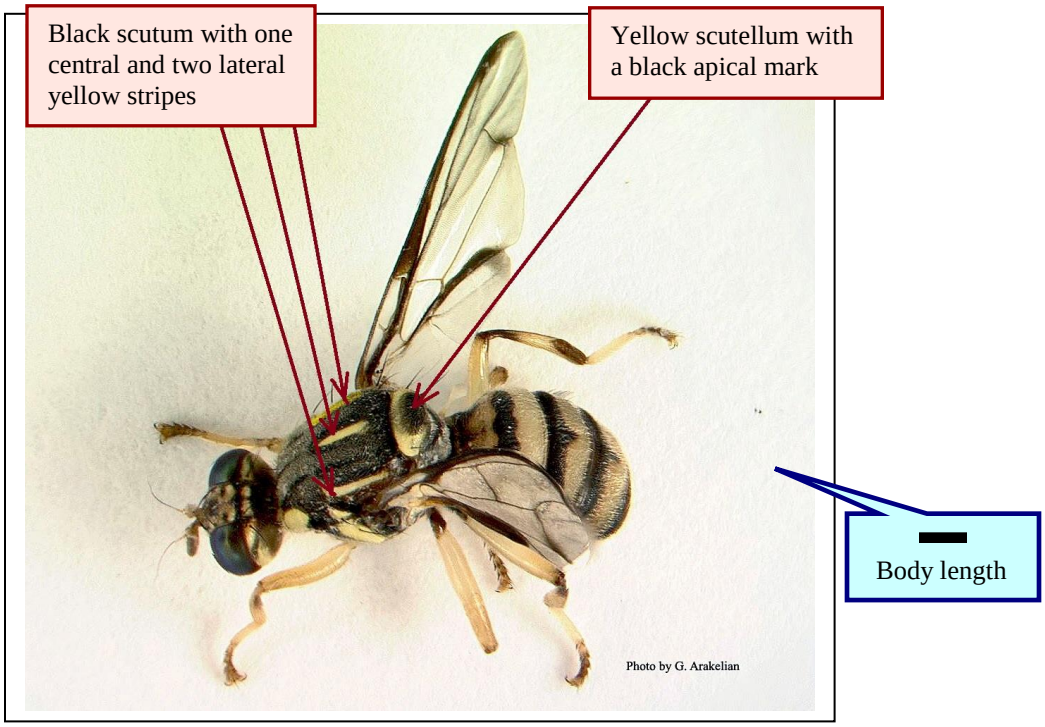


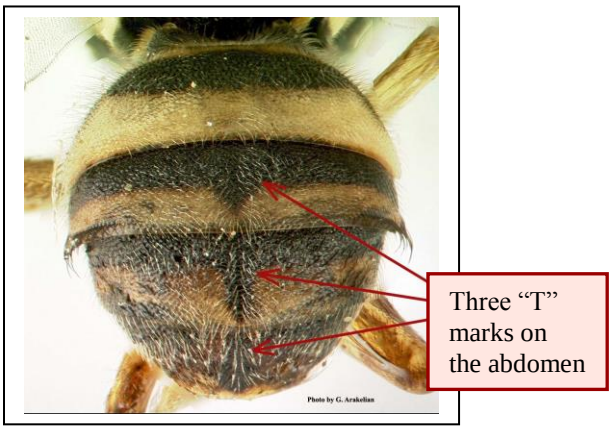


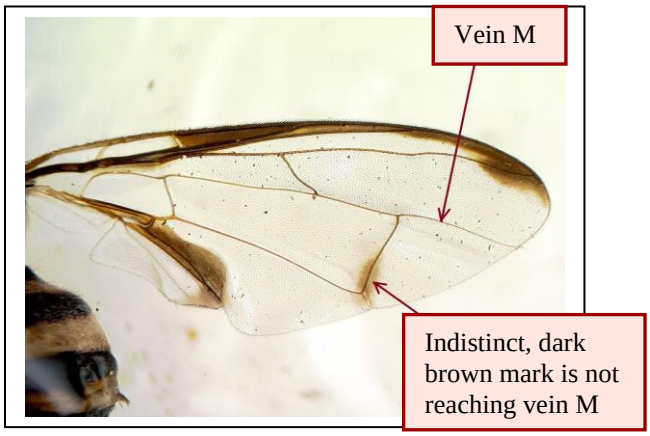


Bactrocera scutellata Striped fruit fly

Distribution and Rating: Occurs in Bhutan, China, India, Japan, Malaysia, Taiwan and Thailand. In the U.S.: California. Rated B.
Hosts and Damage: Feeding is recorded inside flower buds, stems, and fruit of plants from families *Cucurbitaceae* (cucumber, gourd, squash, pumpkin) and *Solanaceae* (eggplant).
Trap/Attractant: Occasionally trapped in Jackson traps with Cue-lure (male sexual attractant) and McPhail traps with yeast pellets (general feeding response) deployed for other exotic fruit flies.
Field ID: Striped fruit fly is slightly larger than a housefly. It has two black spots on its face and mostly black scutum with one central and two lateral yellow stripes (vittae). Scutellum yellow with a black apical mark. Wing with indistinct, dark brown mark (on vein dm-cu) which is not reaching vein M. Abdomen yellow to orange-yellow with tree black "T" marks on dorsal surface. Larvae (maggots) are creamy white, legless with cylindrical bodies narrowed at the anterior end. After developing inside the host plant, they enter the soil to pupate.

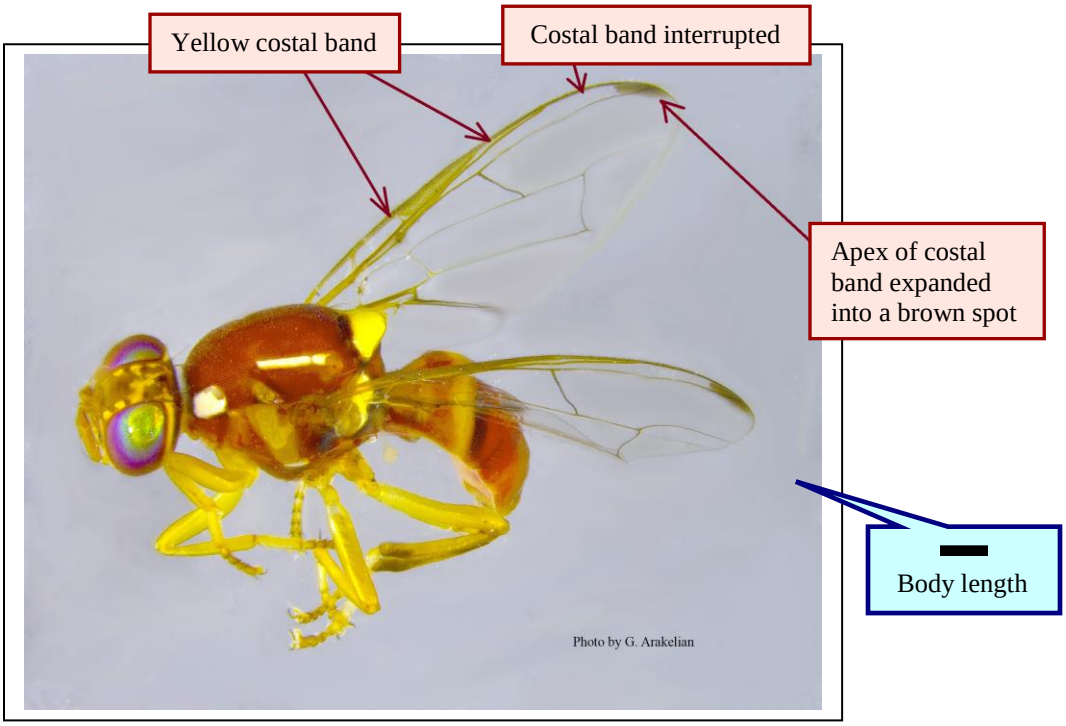


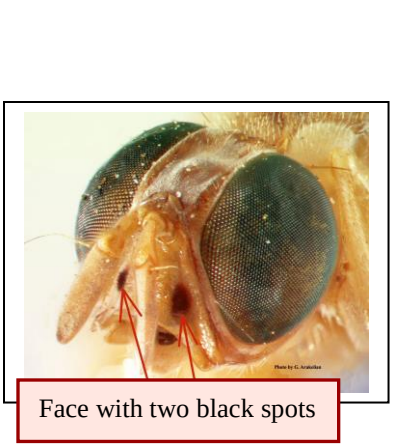


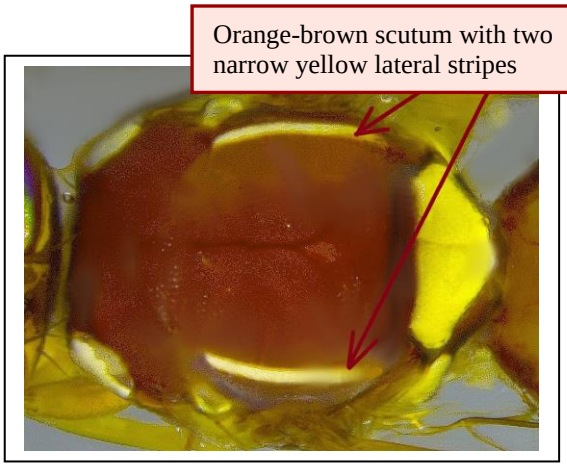


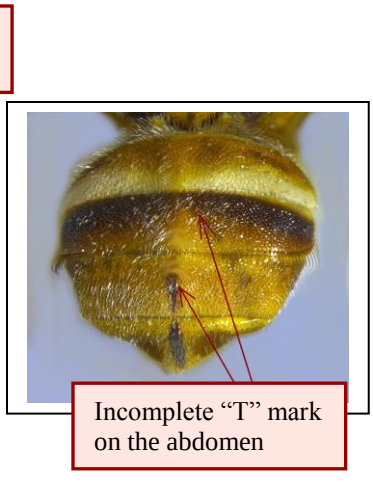
Bactrocera zonata Peach fruit fly

Distribution and Rating: Native to southern and southeastern Asia. Introduced to Near East, Egypt, Mauritius, and Reunion. Rated A.
Hosts and Damage: Known to attack apple, apricot, citrus, fig, guava, mango, papaya, peach, pomegranate, quince, etc. Larvae (maggots) feed inside the fruit, making it unfit for consumption.
Trap/Attractant: Jackson trap with methyl eugenol (primarily as a male attractant) and McPhail trap with yeast pellets (general feeding response).
Field ID: Peach fruit fly is slightly larger than a housefly. It has two black spots on its face and orange-brown scutum with two narrow yellow lateral stripes. Abdomen with incomplete black 'T" mark on dorsal surface. Yellow costal band on the wing is interrupted and expanded at apex into a brown spot. Larvae (maggots) are white to creamy white, legless with cylindrical bodies narrowed at the anterior end. After developing inside the fruit, they enter the soil to pupate.



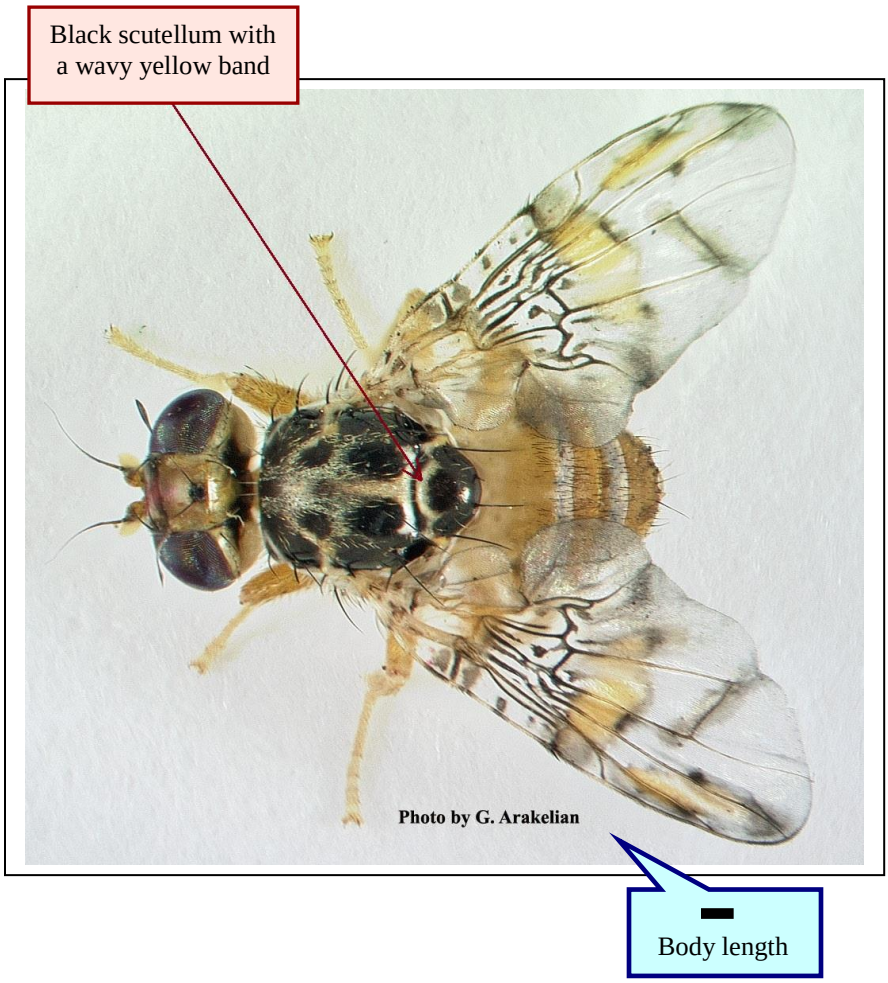


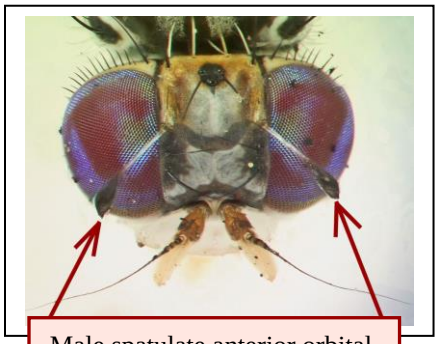


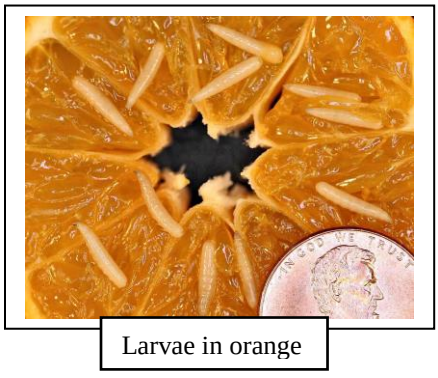


Ceratitis capitata Mediterranean fruit fly

Distribution and Rating: Known from Africa, southern Europe, Middle East, Australia, South and Central America. In the U.S.: Hawaii. Rated A.
Hosts and Damage: Mediterranean fruit fly is a highly polyphagous species recorded from more than 300 plants, including apple, apricot, avocado, cherry, cherimoya, citrus, coffee, fig, guava, jujube, loquat, mango, nectarine, papaya, peach, pear, persimmon, sapote, tomato, walnut, etc. Larvae feed inside the fruit, making it unfit for consumption.
Trap/Attractant: Jackson trap with Trimedlure (primarily as a male attractant) and McPhail trap with yeast pellets (general feeding response).
Field ID: *C. capitata* is slightly smaller than a housefly. It has a black scutellum with a wavy yellow band near base. Males have spatulate anterior orbital setae with black, pointed ends. Adults may also be separated from other species by their characteristic pattern of wing bands. Larvae are legless, creamy white with cylindrical bodies narrowed at the anterior end. They develop inside the fruit and later enter the soil to pupate.

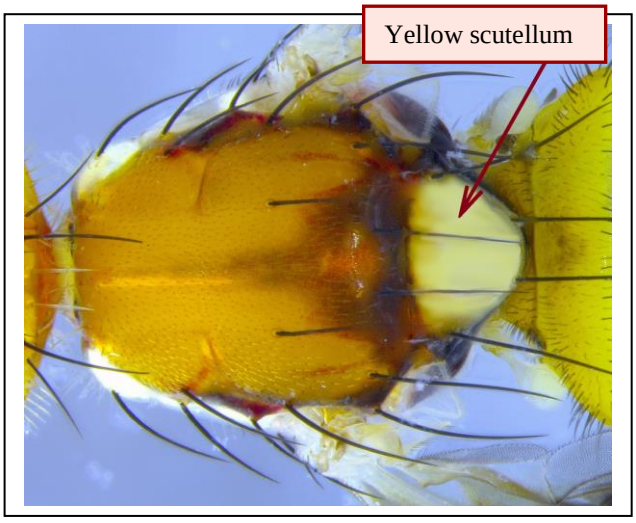


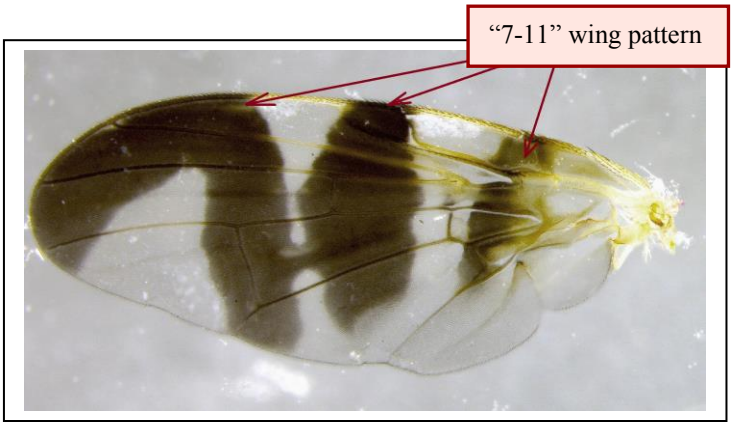




Rhagoletis completa Walnut husk fly

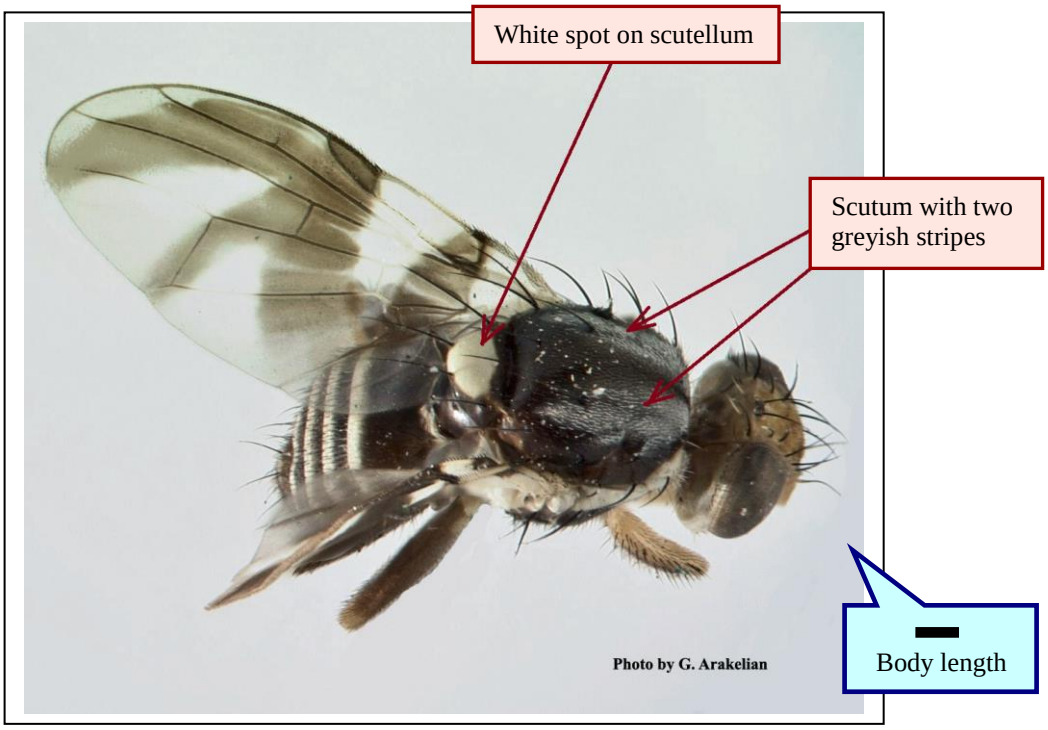
Distribution and Rating: Native to central and southern US. Established in western states. Occurs also in northern Mexico. Introduced into Europe. Rated C.
Hosts and Damage: Attacks walnuts (*Juglans spp*.) including English walnut, California walnut, Black walnut, and others. Recorded also on peaches, nectarines and apricots.
Trap/Attractant: Occasionally trapped in McPhail traps with yeast pellets (general feeding response) deployed for exotic fruit flies.
Field ID: Apple maggot is about the size of a housefly. It has mostly orange-brown body with brownish black markings. Scutellum is yellow. Wings have black colored bands forming characteristic pattern resembling "7-11" number. Larvae (maggots) are legless, creamy white with cylindrical bodies narrowed at the anterior end. They develop inside of walnut husks and later move into the soil to pupate.

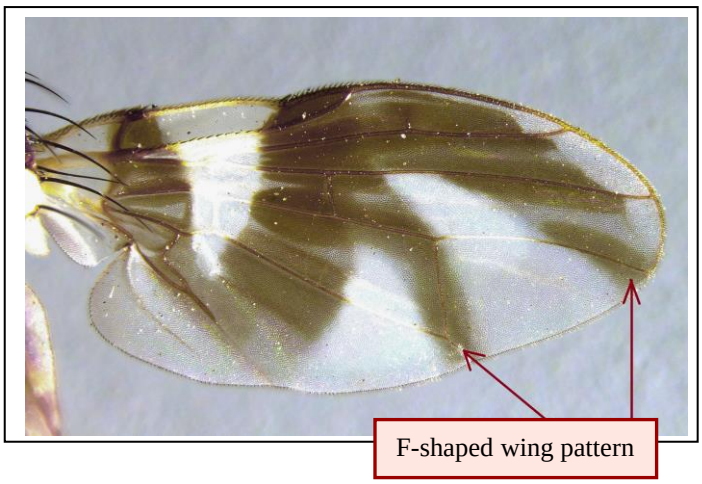


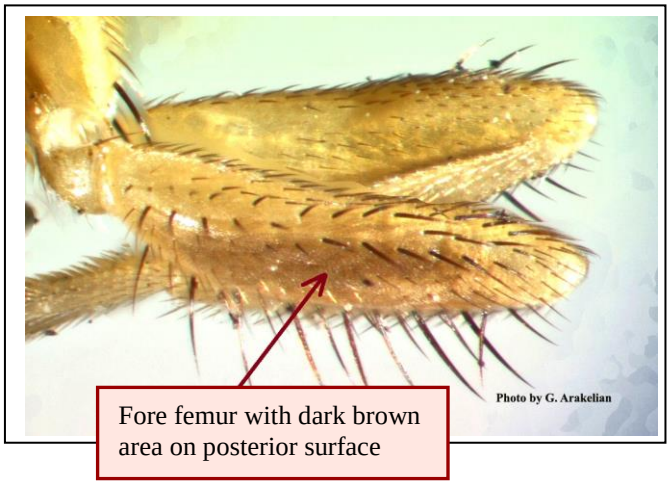


Rhagoletis pomonella Apple maggot

Distribution and Rating: Native to North America. In the US: widespread in middle and eastern states. Established in Utah, Colorado, Nebraska, Oregon, Washington, and northern California. Rated B.
Hosts and Damage: Recorded on apple, apricot, cherry, hawthorn, pear, wild rose, etc.
Trap/Attractant: Occasionally trapped in McPhail traps with yeast pellets (general feeding response) deployed for other exotic fruit flies.
Field ID: Apple maggot is about the size of a housefly. It has predominantly black body. Scutum with two longitudinal greyish stripes. Wings have black colored bands forming distinct F-shaped pattern. Scutellum displays a large white spot. Fore femurs often have dark brown areas on their posterior surfaces. Larvae (maggots) are legless, creamy white with cylindrical bodies narrowed at the anterior end. They develop inside the fruit and later move into the soil to pupate.

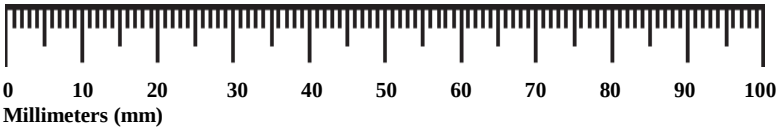






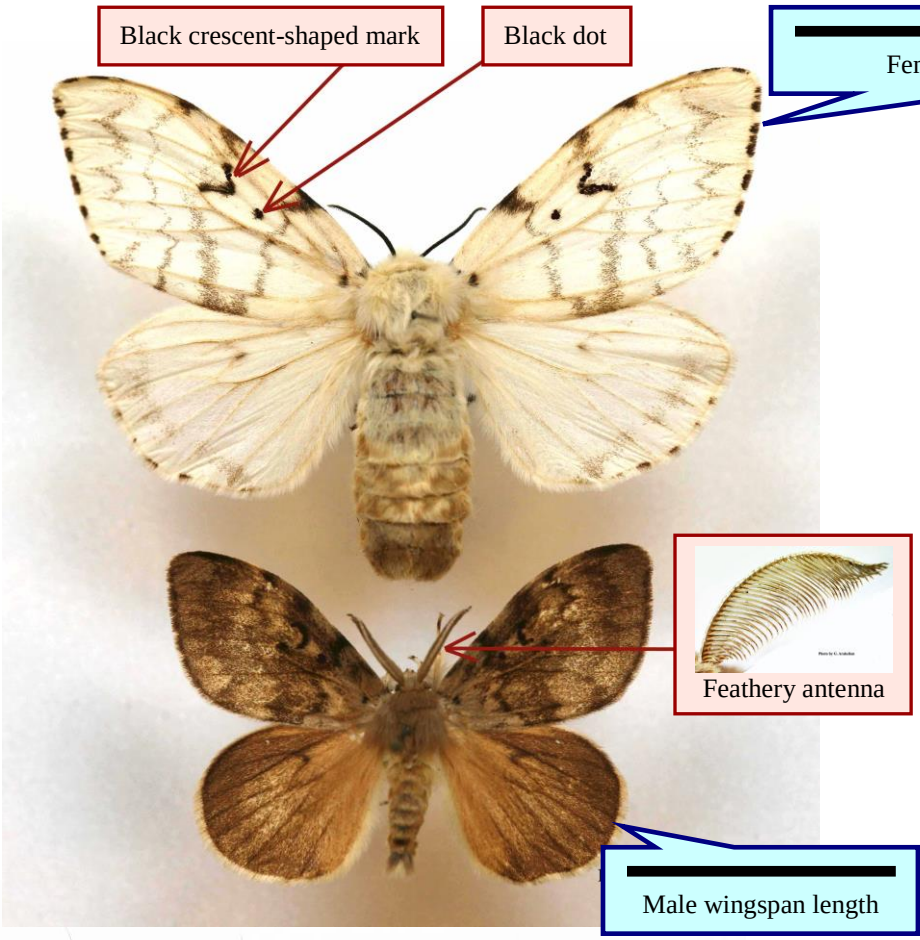
Order: *Lepidoptera*

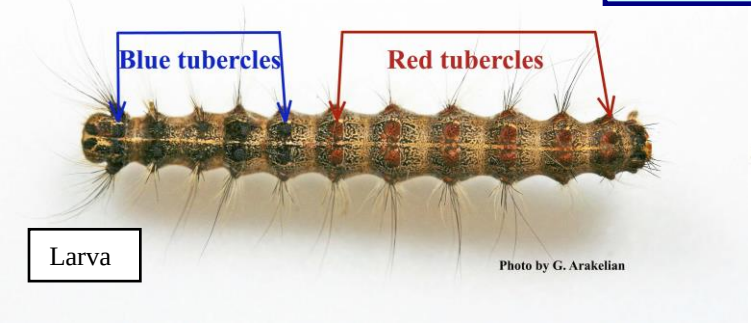
Families: *Lymantriidae*
Pyralidae
Tortricidae



Lymantria dispar Gypsy moth

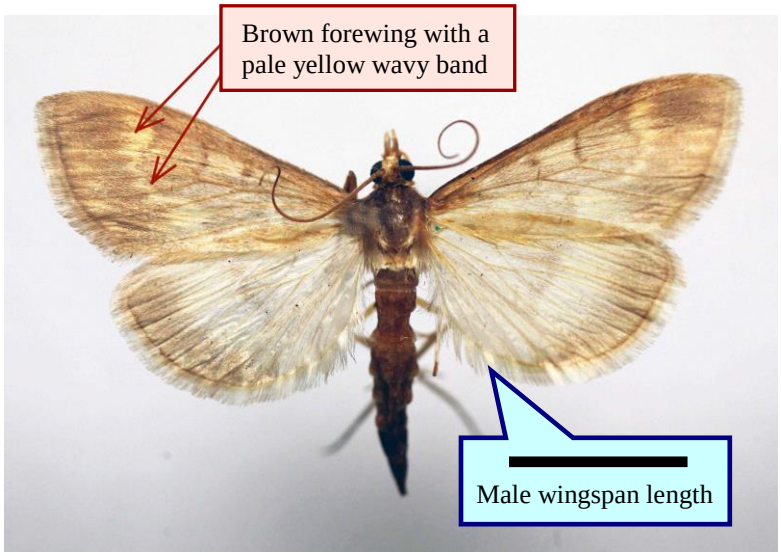
Distribution and Rating: Widely distributed in Eurasia. Found also in northern Africa and eastern Canada. In the U.S.: the entire Northeast and portions of the Southeast and Midwest. Rated A.
Hosts and Damage: Recorded on over 500 plant species. A serious pest of many broadleaf trees and conifers in forests and urban areas. Larvae often defoliate and kill their host plants.
Trap/Attractant: Gypsy moth delta trap with Disparlure (sex pheromone to attract males).
Field ID: Adults are dimorphic. Females (wingspan 55-65 mm) are stout with mainly white coloration. Males (wingspan up to 40 mm) are slender and mostly brown. The forewing (both sexes) with a crescent shape discal mark and an isolated black dot. Adults have bipectinate antennae with longer branches in male (feathery appearance). Mature larvae with five pairs of blue dorsal tubercles on thoracic and first two abdominal segments followed by six pairs of red dorsal tubercles on abdominal segments three to eight. Pupae are dark reddish-brown. Ovoid egg masses (100-1,000 eggs) are covered with tan hairs.

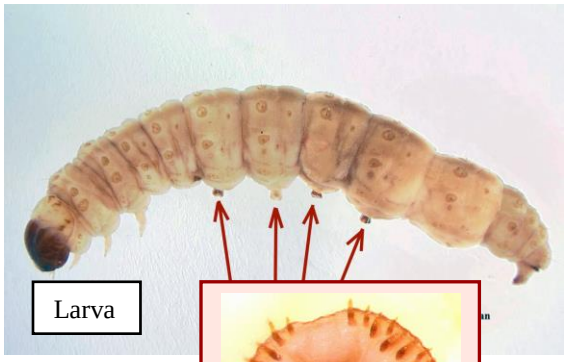


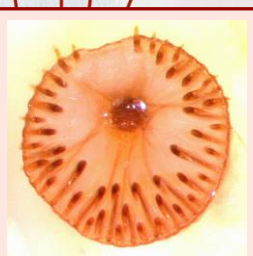


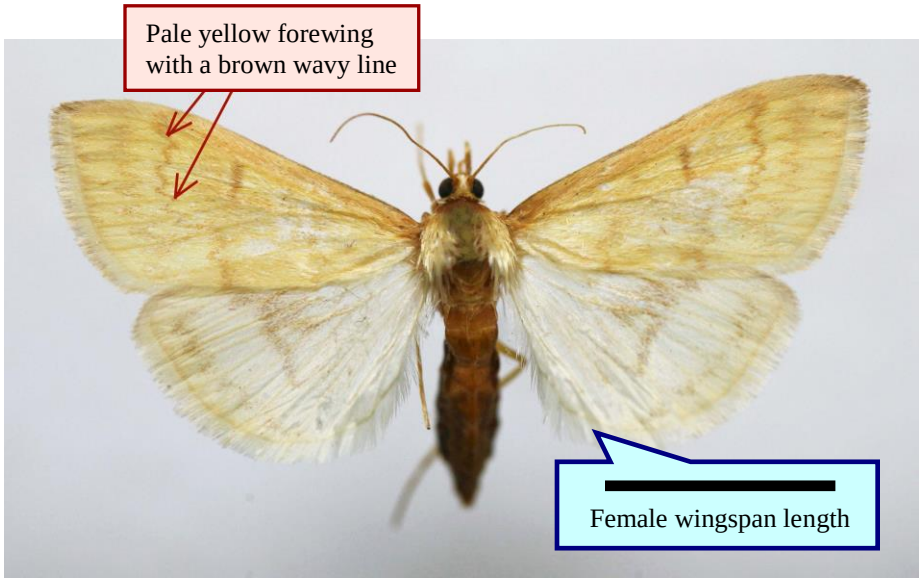
Ostrinia nubilalis European corn borer

Distribution and Rating: Occurs in Europe, western and central Asia, northern Africa, and Canada. In the U.S.: widely distributed from Atlantic coast westward to the Rocky Mountains. Rated A.
Hosts and Damage: Serious pest of maize (corn). Feeding is recorded on over 200 plant species, including barley, bean, celery, dahlia, cotton, millet, oat, pepper, potato, sorghum, and others.
Trap/Attractant: Pherocon 1C trap with a synthetic sex pheromone to attract males.
Field ID: Adults are dimorphic. Females (wingspan 25-34 mm) are larger than males and have pale yellow forewings crossed by brown wavy lines. Males (wingspan 20-26 mm) with pale yellow wavy bands across their predominately brown forewings. Mature larvae (about 25 mm long) have pale brown to pinkish-brown bodies and reddish-brown to dark brown heads. Caterpillars found on maize can be easily separated from commonly occurring Corn earworm *(Helicoverpa zea)* by crochets positioned in an incomplete triordinal ellipse (instead of a single transverse band). Pupae (14-17 mm long) have yellowish-brown to dark brown color. Oval, flattened eggs are laid in clusters overlapping each other.





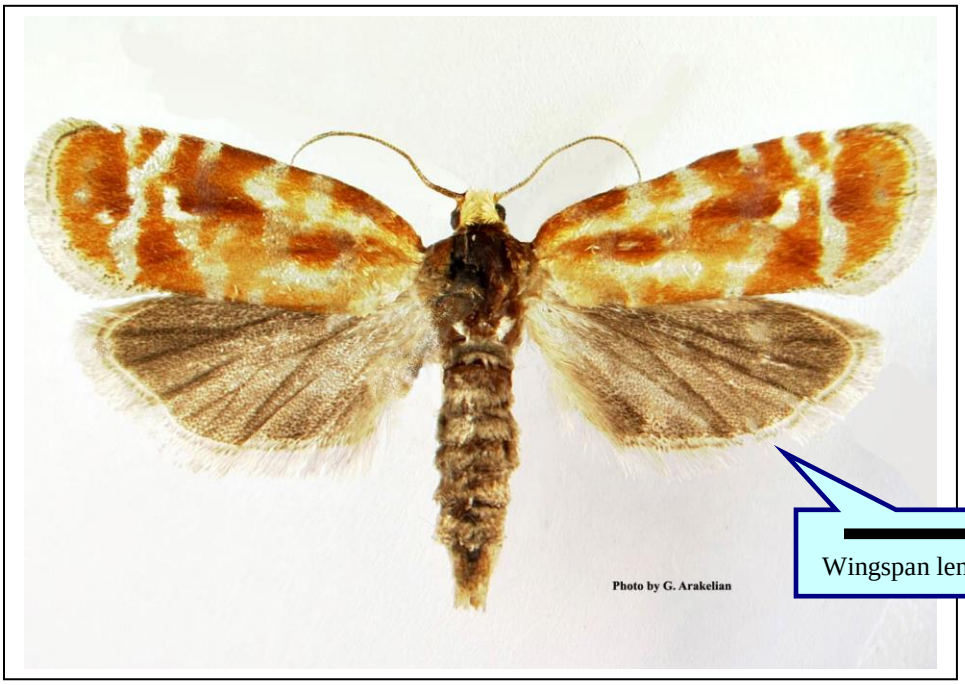

Crochets on prolegs




Resting posture (female)

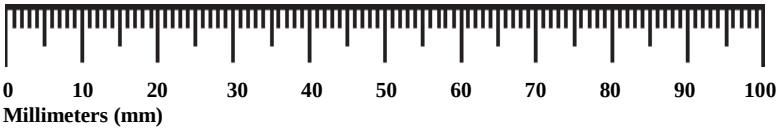
Rhyacionia buoliana European pine shoot moth

Distribution and Rating: Native to Europe. Introduced to southern Canada, northeastern United States, and Pacific Northwest (Oregon, Washington). Rated A.
Hosts and Damage: Attacks various species of pines *(Pinus spp.)* including Austrian black pine, Eastern white pine, Japanese red pine, Lodgepole pine, Mugho pine, Ponderosa pine, Scotch pine, and others. Larvae tunnel in buds and shoots of host trees, distorting them and reducing their economic and aesthetic value.
Trap/Attractant: Pherocon II trap with synthetic sex pheromone to attract males.
Field ID: European pine shoot moth has distinctive orange-red forewings marked with irregular silvery cross lines and grayish-brown hindwings. Wingspan is about 16-23 mm. Mature larva (up to 21 mm long) has yellowish-brown body and black head.



Order: *Coleoptera*

Families: *Dermestidae*
Scarabaeidae



Trogoderma granarium Khapra beetle

Distribution and Rating: Originated in India**.** Currently established in several countries in Europe, Africa, and Asia. Rated A.
Hosts and Damage: One of the world's most destructive pests of stored products. It was recorded feeding on barley, beans, cereal products, corn, dried milk, dried fruits, fishmeal, nuts, oats, peas, rice, wheat, and others.
Trap/Attractant: Trogotrap with a food paste made of powdered milk, ground-up insect bodies, and wheat germ.
Field ID: Adults (about 1.6-3.4 mm long) have hairy, oval, brown to black bodies. Forewings with indistinct reddish-brown markings. Females are noticeably larger than males. Mature larva can reach a length of about 4.0-6.0 mm and has yellowish-brown body covered with relatively long reddish-brown hairs.

Larva (dorsal view)

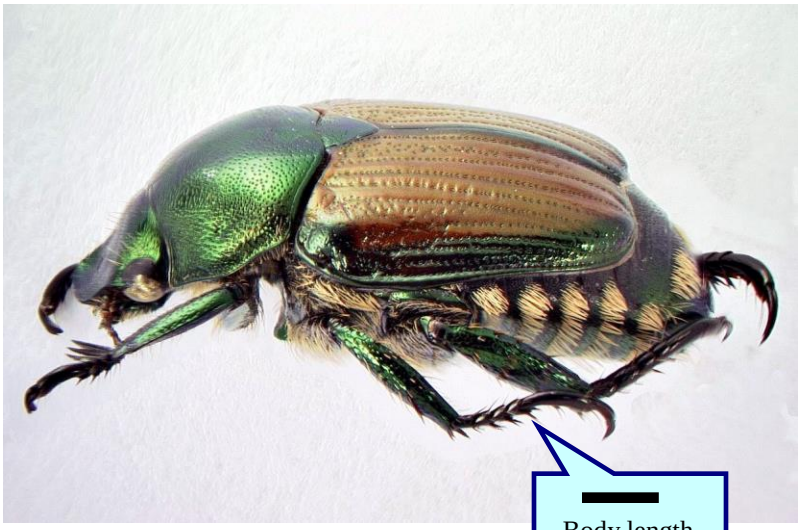
Popillia japonica Japanese beetle

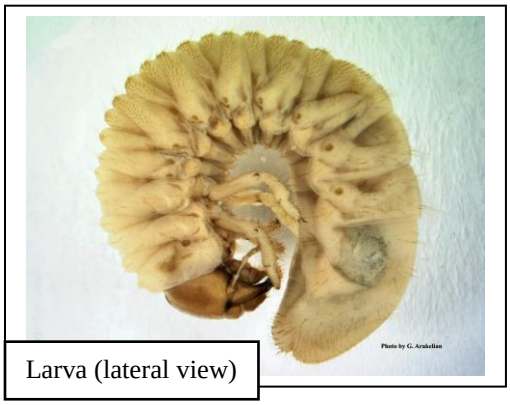
Distribution and Rating: Native to Japan. Found also in China, Canada, Italy, Portugal, and Russia. Introduced and widespread in eastern and southeastern U.S. Rated A.

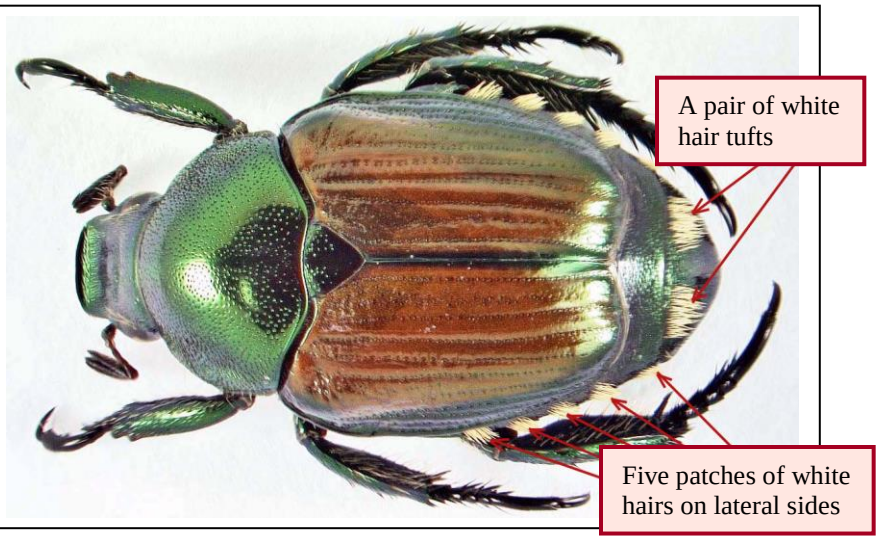
Hosts and Damage: Polyphagous (feeds on nearly 300 species of plants). Adults attack foliage, flowers and fruit of plants. Larvae (grubs) feed on roots and often cause significant damage, especially to turfgrasses and seedlings of ornamental and commercial plants.

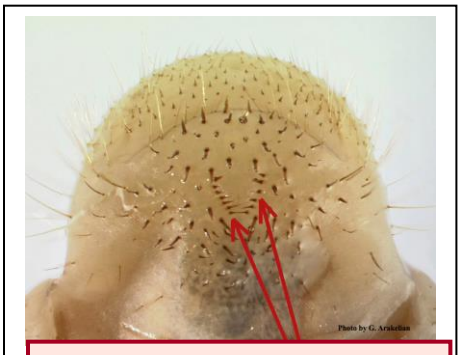
Trap/Attractant: Japanese beetle trap with three attracting components: 1. Japonilure pheromone (male sexual attractant), 2. Lure dispenser with phenethyl propionate, eugenol and geraniol (feeding response), and 3. The green color of the trap (visual attractant).

Field ID: Adults (about 8-11 mm long) have oval, mainly metallic green bodies. Coppery-brown forewings (elytra) do not cover abdomen entirely and expose five patches of white hairs on each lateral side and a pair of white hair tufts on the last abdominal segment. Females are slightly larger than males. Larva can reach a length of about 25-30 mm and has creamy-white, C-shaped body with three pairs of legs and light brown head. The ventral side of the last abdominal segment with two rows of short spines in a characteristic V shape.

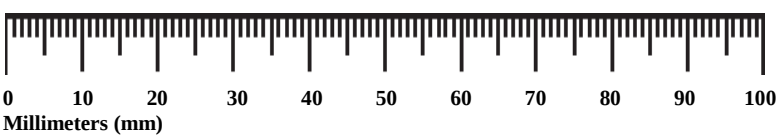



Larva (lateral view)



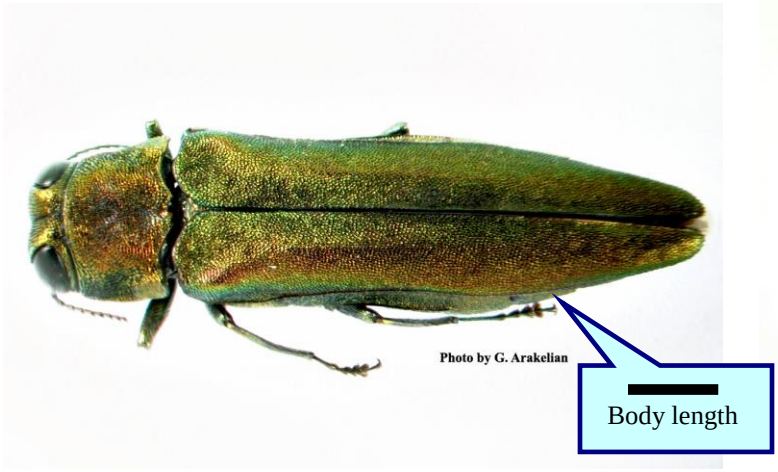

V-shaped pattern of spines (ventral side of the last abdominal segment)

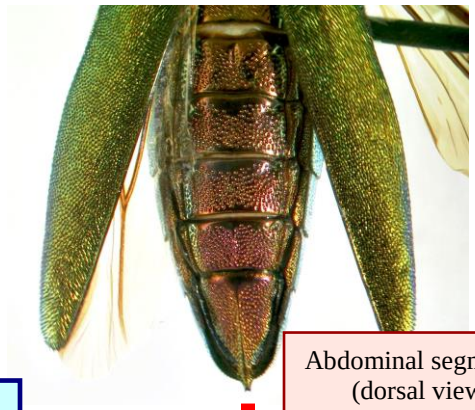
Supplement

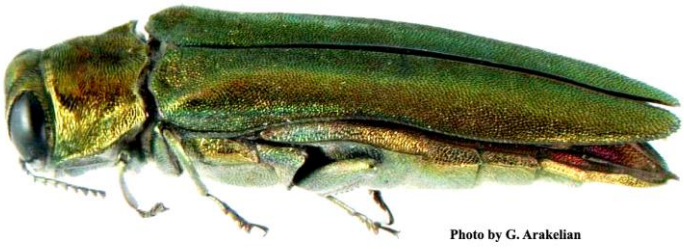


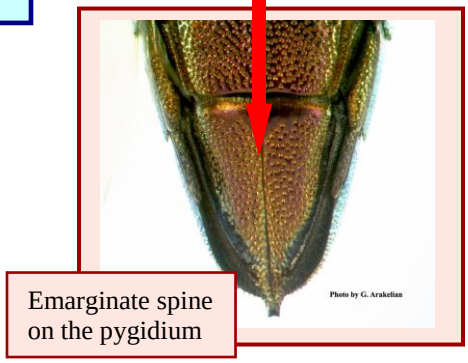
Agrilus planipennis Emerald ash borer

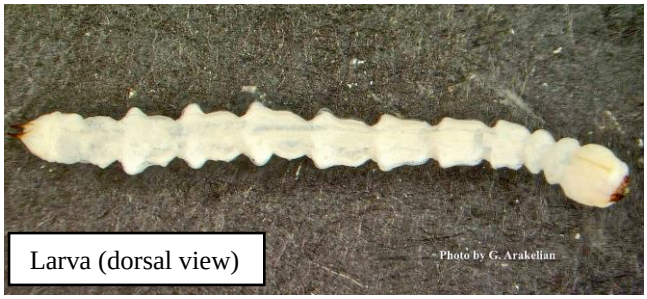
Distribution and Rating: Known from China, Japan, North and South Koreas, Mongolia, Russia, and Taiwan. Accidentally introduced to the U.S. (IL, IN, KY, MD, MI, MN, MO, NY, OH, PA, VA, WV, WI), and Canada (Quebec and Ontario). Rated A.
Hosts and Damage: Attacks ash (*Fraxinus),* and some species of elm *(Ulmus),* walnut (*Juglans),* and wingnut *(Pterocarya).* Adults feed on foliage. Larvae tunnel under outer bark reaching xylem and making long serpentine galleries filled with sawdust and frass. Pupation occurs near the surface and emerging adults make D-shaped (3-4 mm wide) exit holes in the tree. Both stressed and healthy trees can be attacked. Extensive damage often leads to death of the host tree.
Trap/Attractant: Purple (color attractant) Emerald ash borer panel trap with Manuka tree oil (lure).
Field ID: Adults (about 8.5-14.0 mm long) with slender, elongate bodies that have metallic emerald-green to golden-green color in general. Abdominal segments are purplish-copper in dorsal and emerald green in ventral view. Pygidium with emarginate spine. Females are larger than males. Larva (about 26-30 mm long when mature) is flattened, legless, creamy-white with bell-shaped abdominal segments. Terminal segment bears a pair of brown, pincer-like appendages.

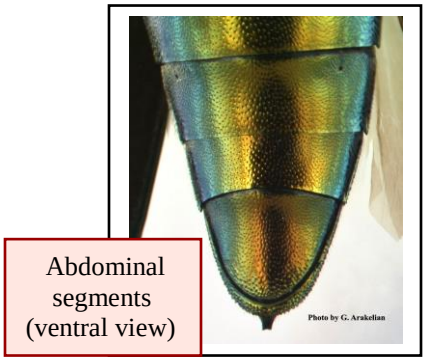






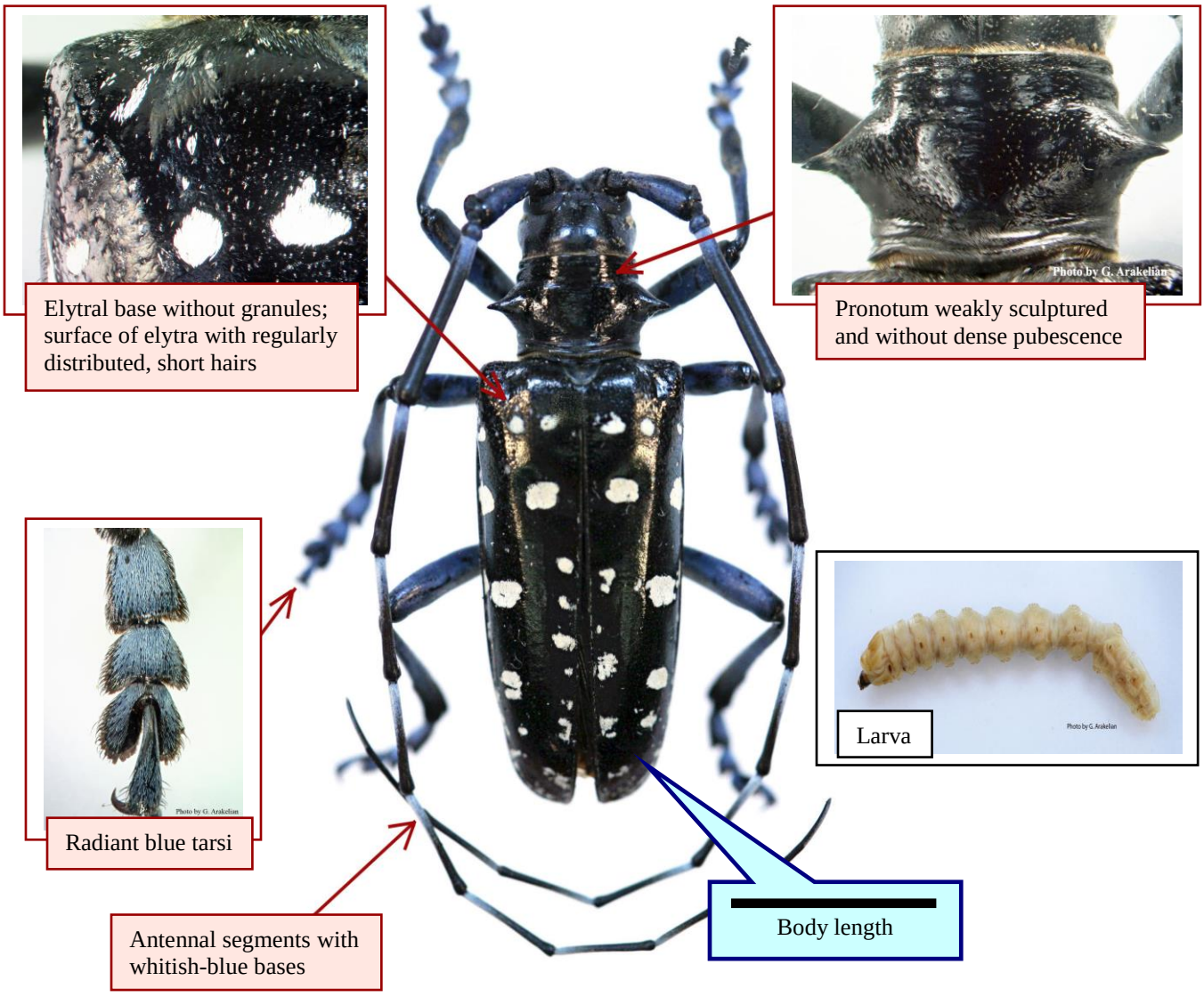






Anoplophora glabripennis Asian longhorned beetle

Distribution and Rating: Occurs in China, Japan, North and South Koreas, and Taiwan. Accidentally introduced to the U.S. and currently present in Massachusetts, New York and Ohio. Rated A.
Hosts and Damage: Attacks many broadleaf trees, including ash, birch, elm, maple, mulberry, poplar, willow and others. Larvae feed in cambium and later enter woody tissues. Pupation occurs in the heartwood and emerging adults make large (about 10 mm in diameter), round exit holes in the tree. Both weakened and healthy trees can be attacked. Severe damage may lead to death of the host tree.
Trap/Attractant: Not developed.
Field ID: Adults are about 20-35 mm long with glossy black bodies and about 20 irregular white spots on the elytra. Females are larger than males. Antennal segments with whitish-blue bases. Pronotum is black, weakly sculptured, and without dense pubescence. Elytral base is relatively smooth without granules. Surface of elytra with regularly distributed, short hairs. Tarsi (dorsal view) radiant blue. Larva (about 50 mm long when fully grown) is legless creamy-white with brown pattern on prothorax. Eggs are elongate white about 5-7 mm long.



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