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Pest Profile



Photo credit: Gilles Gonthier, Flickr

Common Name: Aerial Yellow Jacket

Scientific Name: *Dolichovespula arenaria*

Order and Family: Hymenoptera: Vespidae

Size and Appearance:

	Length (mm)	Appearance
Egg		
Larva/Nymph		<ul style="list-style-type: none">• Creamy white and legless.
Adult	12.7 mm Forewing length 12 - 13 mm (queen)	<ul style="list-style-type: none">• Yellow and black bands on the abdomen.• Yellow legs.• Antennae black dorsally and yellow ventrally.• Workers with elongated black clypeal spot, sometimes with small spots on each side.• Wings folded longitudinally while at rest.
Pupa (if applicable)		<ul style="list-style-type: none">• Generally wasp shaped with appendages held close to body.• Creamy white in early development, darkened later in development.

Type of feeder (Chewing, sucking, etc.): Chewing

Host/s: Aerial yellow jackets hunt live insects, including pear psylla, but will also feed on carrion. In late summer, workers may scavenge for sugary substances.

Description of Damage (larvae and adults): Aerial yellow jackets do not typically cause damage, but present a serious stinging risk due to their aggressive defensive behavior near their nests.

References:

Akre, R. D., Greene, A., MacDonald, J. F., Landolt, P. J., & Davis, H. G. (1981). The yellowjackets of America north of Mexico.

Kimsey, L., & Carpenter, J. (2012). The Vespinae of North America (Vespidae, Hymenoptera). *Journal of Hymenoptera Research*, 28, 37-65. doi:10.3897/jhr.28.3514

Southern Yellowjackets. (n.d.). Retrieved from <https://texasinsects.tamu.edu/southern-yellowjackets/>

Pest Profile



Photo credit: Michael K. Oliver, Ph.D., Wikipedia

Common Name: American Carrion Beetle

Scientific Name: *Necrophila americana*

Order and Family: Coleoptera: Silphidae

Size and Appearance:

	Length (mm)	Appearance
Egg		
Larva/Nymph		<ul style="list-style-type: none">● Elongated and black in color.● Two segmented projections on the terminal abdominal segment.● Sclerite present on the second sternite.
Adult	12 - 22 mm	<ul style="list-style-type: none">● Oval with a large yellow pronotum. The center of the pronotum is black.● Tip of abdomen exposed beyond elytra and is yellow in the northern range and black in the southern range.● The head, legs, antennae, and underside of the body are black.● Weakly clubbed antennae.● Reticulate elytral sculpturing.
Pupa (if applicable)		

Type of feeder (Chewing, sucking, etc.): Chewing

Host/s: Both the adult and the larvae feed on carrion including the hide, sinew and flesh, fly larvae, and beetle larvae.

Description of Damage (larvae and adults): Carrion beetles typically do not cause damage but can be an important insect for forensic entomologists.

References:

Byrd, J. H., & Castner, J. L. (2010). *Forensic entomology: The utility of arthropods in legal investigations*. Boca Raton: Taylor & Francis.

Ratcliffe, B. C. (1996). *The carrion beetles (Coleoptera: Silphidae) of Nebraska*. Lincoln: University of Nebraska.

Pest Profile



Photo credit: April Nobile, AntWeb

Common Name: Black Imported Fire Ant

Scientific Name: *Solenopsis richteri*

Order and Family: Hymenoptera: Formicidae

Size and Appearance:

	Length (mm)	Appearance
Egg		<ul style="list-style-type: none">● Oval and white.
Larva/Nymph		<ul style="list-style-type: none">● Legless, comma shaped, and white.
Adult	1 - 4 mm	<ul style="list-style-type: none">● Browning black with a darker abdomen.● First segment of abdomen with a reddish - orange spot.● 10 segmented (11 segmented on the queen), elbowed antennae ending in a 2 segmented club.● Black scape.● Two segmented waist.
Pupa (if applicable)		<ul style="list-style-type: none">● Similar in shape to worker ants, but with appendages held close to the body.

Type of feeder (Chewing, sucking, etc.): Chewing.

Host/s: A variety of hosts comprise the diet of the black imported fire ant including arthropods, dead animals, seeds, honeydew, oily meats, nuts, and sweet substances. They have had an ecological impact by eliminating ground nesting species from the local environment. Fire ants also feed on young saplings and seedlings and can damage developing buds and fruits. Many agricultural crops are also negatively affected by the feeding and nesting habits of fire ants including soybean, corn, and okra.

Description of Damage (larvae and adults): Black imported fire ants can build unsightly mounds in yards or other grassy areas. Humans and pets may come in contact with the ants when the nests are disturbed. The ants are aggressive and will readily sting and bite the threat, resulting in a burning and itching sensation. Shortly after, white pustules form and can last for weeks, potentially becoming infected and leaving scar tissue. Some short term effects from the stings to sensitive people include nausea, dizziness, chest pain, shock, and even death. Fire ants have also been implicated in damaging electrical equipment by chewing on the wires.

References:

Adams, C. T. (1986). Agricultural and medical impact of the imported fire ants. *Fire ants and leaf cutting ants: biology and management*. Westview Press, Boulder, CO, 435, 48-57.

Greenberg, L., & Kabashima, J. N. (2013). Red Imported Fire Ant. *Pest Notes*.

Lockley, T. C. (2015, July 03). Imported Fire Ants. Retrieved from <https://ipmworld.umn.edu/lockley>

MacGown, J. A. (2009). Ants (Formicidae) of the Southeastern United States. Retrieved from https://mississippientomologicalmuseum.org.msstate.edu/Researchtaxapages/Formicidaepages/genericpages/Solenopsis_richteri.htm

Smith, E. H., & Whitman, R. C. (1992). *NPCA field guide to structural pests*. Dunn Loring, VA: NPCA.

Pest Profile



Photo credit: Mark Helm, Flickr

Common Name: Blue Mud Dauber

Scientific Name: *Chalybion californicum*

Order and Family: Hymenoptera: Sphecidae

Size and Appearance:

	Length (mm)	Appearance
Egg		
Larva/Nymph	25 mm	<ul style="list-style-type: none">• Creamy white.
Adult	12 -18 mm	<ul style="list-style-type: none">• Entire body deep metallic blue, blue-green, or black.• Wings are blueish.
Pupa (if applicable)		<ul style="list-style-type: none">• Silky white cocoon.

Type of feeder (Chewing, sucking, etc.): Chewing.

Host/s: Adult females provision cells with spiders, including black widow (*Latrodectus spp.*) for nourishment for larvae.

Description of Damage (larvae and adults): This species does not cause damage, but their activity near buildings can be a nuisance. Although capable of stinging, blue mud daubers do not defend nests and do not typically sting. Blue mud daubers usually reuse the nests of black and yellow mud dauber wasp, and

are not often found constructing brand new nests on buildings. However, the presence of the nests on structures can be unsightly and may need to be removed.

References:

Chalybion californicum. (n.d.). Retrieved from [https://www.discoverlife.org/20/q?search=Chalybion californicum](https://www.discoverlife.org/20/q?search=Chalybion%20californicum)

Landes, D. A., Obin, M. S., Cady, A. B., & Hunt, J. H. (1987). Seasonal and Latitudinal Variation in Spider Prey of the Mud Dauber Chalybion Californicum (Hymenoptera, Sphecidae). *The Journal of Arachnology*, 249-256.

Pest Profile



Photo credit: Katja Schulz, Flickr

Common Name: Camel Cricket

Scientific Name: *Ceuthophilus spp*

Order and Family: Orthoptera: Rhaphidophoridae

Size and Appearance:

	Length (mm)	Appearance
Egg		
Larva/Nymph		<ul style="list-style-type: none">• Similar in appearance to adults, but smaller and lacking reproductive organs.
Adult	12 - 33 mm	<ul style="list-style-type: none">• Hunchbacked appearance and wingless.• Color variable, but usually tan to brown with mottled appearance.• Elongated legs, both femora and tibia typically longer than body.• Thin antennae longer than body.• Females with ovipositor more than half body length.

Type of feeder (Chewing, sucking, etc.): Chewing.

Host/s: The diet of the members of *Ceuthophilus* is diverse, with species being omnivorous, herbivorous, and scavengers. Natural food sources include fungi, persimmons, insect eggs, and dead insects. Prey items include millipedes, pseudoscorpions, earthworms and crickets. Species have also been documented feeding on a variety of baits, including cheese, oatmeal, bread, peanut butter, molasses, fruit, pet food, and wheat germ.

Description of Damage (larvae and adults): Although not typically known to cause damage, various species have been observed chewing holes in clothing and drapery. Accumulations of dead bodies have been implicated in polluting well water. Fecal matter from heavy infestations can result in staining.

References:

Smith, E. H., & Whitman, R. C. (1992). *NPCA field guide to structural pests*. Dunn Loring, VA: NPCA.

Taylor, S. J., Krejca, J. K., & Denight, M. L. (2005). Foraging Range and Habitat Use of *Ceuthophilus secretus* (Orthoptera: Rhaphidophoridae), a Key Trogloxene in Central Texas Cave Communities. *The American Midland Naturalist*, 154(1), 97-114. doi:10.1674/0003-0031(2005)154[0097:frahuo]2.0.co;2

Waldvogel, M., & Alder, P. (2018, June 1). Camel Crickets. Retrieved from <https://content.ces.ncsu.edu/camel-crickets>

Pest Profile



Photo credit: Patrick Clement, Flickr

Common Name: Case-making Clothes Moth

Scientific Name: *Tineola pellionella*

Order and Family: Lepidoptera: Tineidae

Size and Appearance:

	Length (mm)	Appearance
Egg		
Larva/Nymph		<ul style="list-style-type: none">● Slender and white.● Darkened head and sclerotized plate on the prothorax.● Crochets present on abdominal prolegs.● Two ocelli on head.● Larvae construct a silken tube incorporating parts of the substrate.
Adult	7 - 8 mm 10 - 14 mm (wingspan)	<ul style="list-style-type: none">● Narrow, shiny, golden-brown wings.● Three dark spots on each forewing.● Fringed hairs on wing margins.
Pupa (if applicable)		<ul style="list-style-type: none">● Pupae are contained within the silken tube.

Type of feeder (Chewing, sucking, etc.): Larvae have chewing mouthparts. Adults do not feed.

Host/s: Case making clothes moth larvae feed on a variety of animal and plant based materials. Typical materials attacked include wools, feathers, down, fur, felts, leather, and hair. In addition, taxidermy mounts and mummified carcasses are targets. Larvae can also feed on plant based materials including almonds, saffron, and various herbs.

Description of Damage (larvae and adults): Damage is characterized by surface feeding on the material with occasional trenches and holes in extreme cases.

References:

Bennett, G. W., Owens, J. M., Corrigan, R. M., & Truman, L. C. (2016). *Truman's scientific guide to pest management operations*. Cleveland, OH: North Coast Media, LLC.

Field Guide to Common Texas Insects. (n.d.). Retrieved from <https://texasinsects.tamu.edu/casemaking-clothes-moth/>

Jacobs, S. (2013, January). Clothes Moth (Department of Entomology). Retrieved from <https://ento.psu.edu/extension/factsheets/clothes-moth>

Smith, E. H., & Whitman, R. C. (1992). *NPCA field guide to structural pests*. Dunn Loring, VA: NPCA.

Pest Profile



Photo credit: Udo Schmidt, Flickr

Common Name: Colorado Potato Beetle

Scientific Name: *Leptinotarsa decemlineata*

Order and Family: Coleoptera: Chrysomelidae

Size and Appearance:

	Length (mm)	Appearance
Egg	1.7 -1.8 mm long 0.8 mm wide	<ul style="list-style-type: none">• Orange - yellow color.• Elongated and football shaped.
Larva/Nymph	12.7 mm	<ul style="list-style-type: none">• Enlarged abdomen in relation to thorax and head, resulting in hunchback appearance.• Red color with rows of black spots on each side of the body.• Proleg at tip of abdomen.
Adult	9.5 mm long 6.4 mm wide	<ul style="list-style-type: none">• Oval shaped beetle.• Yellow - orange elytra with ten black longitudinal stripes.• Thorax with black spots.• One triangular black spot between the eyes.
Pupa (if applicable)		<ul style="list-style-type: none">• Oval and orange.

Type of feeder (Chewing, sucking, etc.): Chewing.

Host/s: Originally buffalo bur (*Solanum rostratum*), but is a serious pest of cultivated potato. Additional hosts include belladonna, common nightshade, eggplant, ground cherry, henbane, horsenettle, tobacco, thorn apple, and tomato.

Description of Damage (larvae and adults): Both larvae and adults feed on the leaves and stems of the potato plant, resulting in defoliation and possible death. Various diseases are also transmitted, including spindle tuber, bacterial wilt, and root rot. The damage caused by the feeding and disease can result in complete tuber loss and significant yield loss.

References:

Asghar Fathi, S. A., Fakhr-Taha, Z., Razmjou, J., & Palumbo, J. (2013). Life-history parameters of the Colorado potato beetle, *Leptinotarsa decemlineata*, on seven commercial cultivars of potato, *Solanum tuberosum*. *Journal of Insect Science*, 13(1)

Capinera, John L (2001). *Handbook of vegetable pests* (1st ed). Academic Press, San Diego, Calif

Pedigo, L. P., & Rice, M. E. (2015). *Entomology and pest management*. Long Grove, IL: Waveland Press.

Pest Profile



Photo credit: Bbski, Wikimedia

Common Name: Dark Eyed Fruit Fly

Scientific Name: *Drosophila repleta* Group

Order and Family: Diptera: Drosophilidae

Size and Appearance:

	Length (mm)	Appearance
Egg		
Larva/Nymph		<ul style="list-style-type: none">• Elongated and creamy white.
Adult	2.5 - 4.5 mm	<ul style="list-style-type: none">• Similar to <i>D. melanogaster</i>, but slightly larger.• Aristate antennae• Coxae of forelegs darker than remainder of legs.• Dark red eyes
Pupa (if applicable)		<ul style="list-style-type: none">• Darkened and cylindrical.• Two small protrusions apical end of the pupa.

Type of feeder (Chewing, sucking, etc.): Sponging.

Host/s: *Drosophila repleta* contains over 80 species with a variety of hosts. However, most species are cactophilic (feeding on cacti). Some species are also attracted to bananas or other fruits. Larvae feed on the yeast of fermenting organic matter. *Drosophila repleta* also feed on spilled animal feed. Adults are attracted to red wine.

Description of Damage (larvae and adults): Damage is limited. If a fruit or vegetable is infested by fruit fly larvae, it is already decomposing. The presence of flies may also be indicative of existing poor sanitation.

References:

Markow, T. A., & O'Grady, P. (2005). *Drosophila: a guide to species identification and use*. Elsevier.

Sawaby, R. F., Hamouly, H. E., & Ela, R. H. (2018). Diagnosis and keys of the main dipterous families and species collected from rabbit and guinea pig carcasses in Cairo, Egypt. *The Journal of Basic and Applied Zoology*, 79(1). doi:10.1186/s41936-018-0018-6

Pest Profile



Photo credit: Tom Murray, pbase.com

Common Name: Downy Yellow Jacket

Scientific Name: *Vespula flavopilosa*

Order and Family: Hymenoptera: Vespidae

Size and Appearance:

	Length (mm)	Appearance
Egg		
Larva/Nymph		<ul style="list-style-type: none">• Creamy white and legless.
Adult	10 - 16 mm (workers) Fore wing length: 8 - 11 mm (workers) 12.5 - 14.5 mm (queen) 11 - 12.5 mm (males)	<ul style="list-style-type: none">• First abdominal segment yellow with black anchor or broad triangular shape.• Wings folded longitudinally while at rest.
Pupa (if applicable)		<ul style="list-style-type: none">• Generally wasp shaped with appendages held close to body.• Creamy white in early development, darkened later in development.• Enclosed in a silken cocoon.

Type of feeder (Chewing, sucking, etc.): Chewing.

Host/s: Downy yellow jackets are active scavengers and also hunt live prey to feed their developing larvae. Workers receive nourishment from other sources of sugar.

Description of Damage (larvae and adults): This wasp does not typically cause damage, however, their presence around human structures can be dangerous as they are capable of stinging and will actively defend their nests.

References:

Buck, M., Marshall, S. A., & Cheung, D. K. (2008, February 19). Identification Atlas of the Vespidae (Hymenoptera, Aculeata) of the northeastern Nearctic region. Retrieved from https://cjai.biologicalsurvey.ca/bmc_05/key_vespula.html

Kimsey, L., & Carpenter, J. (2012). The Vespinae of North America (Vespidae, Hymenoptera). *Journal of Hymenoptera Research*, 28, 37-65. doi:10.3897/jhr.28.3514

Pest Profile



Photo credit: James Gathany, Flickr

Common Name: Eastern Treehole Mosquito

Scientific Name: *Aedes triseriatus*

Order and Family: Diptera: Culicidae

Size and Appearance:

	Length (mm)	Appearance
Egg		<ul style="list-style-type: none">● Shiny black and elongated.● Micropylar (pore in membrane) collars.
Larva/Nymph		<ul style="list-style-type: none">● Long with enlarged thorax.● Short antennae, half as long as head and with tuft.● Siphon present on abdomen.
Adult	3.5 - 4 mm (wing length)	<ul style="list-style-type: none">● Black proboscis with short palpi.● Scutum brown to black with stripes of brown scales.● Abdomen with white markings in a row on each side.
Pupa (if applicable)		<ul style="list-style-type: none">● Thoracic respiratory trumpets● Curved appearance.

Type of feeder (Chewing, sucking, etc.): Piercing-sucking.

Host/s: Larvae feed on suspended microorganisms and detritus. Females are obligate blood feeders and frequently attack humans. Blood meals are required for the development of eggs. Males are non-biting and receive nourishment from nectar.

Description of Damage (larvae and adults): Females are known to bite people and can transmit La Crosse encephalitis, *Dirofilaria immitis*, Cache Valley, eastern equine encephalitis, Highlands J, Jamestown Canyon, and WN viruses.

References:

Bova, J., Paulson, S., & Paulson, G. (2016). Morphological differentiation of the eggs of North American container-inhabiting *Aedes* mosquitoes. *Journal of the American Mosquito Control Association*, 32(3), 244-247.

Carpenter, S. J., & J., L. C. (1974). *Mosquitoes of North America: North of Mexico*. Berkeley: Univ. of Calif. Pr.

Farajollahi, A., & Price, D. C. (2013). A rapid identification guide for larvae of the most common North American container-inhabiting *Aedes* species of medical importance. *Journal of the American Mosquito Control Association*, 29(3), 203-222

Smith, E. H., & Whitman, R. C. (1992). *NPCA field guide to structural pests*. Dunn Loring, VA: NPCA.

Pest Profile



Photo credit: Bernie Kohl (Ernie), Wikimedia

Common Name: European Hornet

Scientific Name: *Vespa Crabro*

Order and Family: Hymenoptera: Vespidae

Size and Appearance:

	Length (mm)	Appearance
Egg		
Larva/Nymph		<ul style="list-style-type: none">• Creamy white body with yellow head.
Adult	25 mm (worker) 35 mm (queen)	<ul style="list-style-type: none">• Appear much like a typical yellowjacket species, except larger.• The abdomen is mostly yellow with black markings and some red on the first abdominal tergite.• The thorax, head, legs, and antennae are reddish-brown.
Pupa (if applicable)		<ul style="list-style-type: none">• Creamy white color that darkens during development.• The pupae resembles a mummified wasp.

Type of feeder (Chewing, sucking, etc.): Chewing

Host/s: *Vespa crabro* feed primarily on cicada species, but will also feed on other arthropods, including spiders, crickets, grasshoppers, caterpillars, flies, honey bees, and yellowjackets.

Description of Damage (larvae and adults): These hornets do not typically cause damage, but they may nest indoors in areas such as attic spaces or ceiling and wall voids. If their entry points are blocked, they may chew through walls to enter the living space.

References:

Jacobs, S. B. (2000). European Hornet. *College of Agricultural Sciences - Cooperative Extension*.

Johnson, D., & Townsend, L. (n.d.). European Hornet in Kentucky. Retrieved from <https://entomology.ca.uky.edu/ef600>

Kaya, M., Sofi, K., Sargin, I., & Mujtaba, M. (2016). Changes in physicochemical properties of chitin at developmental stages (larvae, pupa and adult) of *Vespa crabro* (wasp). *Carbohydrate Polymers*, 145, 64-70. doi:10.1016/j.carbpol.2016.03.010

Ross, K., & Matthews, R. (Eds.). (1991). *The Social Biology of Wasps*. ITHACA; LONDON: Cornell University Press. Retrieved from <http://www.jstor.org/stable/10.7591/j.ctv3s8r7j>

Pest Profile



Photo credit: Andy Reago & Chrissy McClarren, Flickr (Male); Judy Gallagher, Flickr (Female)

Common Name: Evergreen Bagworm

Scientific Name: *Thyridopteryx ephemeraeformis*

Order and Family: Lepidoptera: Psychidae

Size and Appearance:

	Length (mm)	Appearance
Egg		<ul style="list-style-type: none">● Cylindrical and smooth.
Larva/Nymph	38.1 - 63.5 mm (Completed bag)	<ul style="list-style-type: none">● Larvae are enclosed in a silken bag with pieces of host plant foliage and stems incorporated lengthwise.● Larvae are brown and mottled with black.
Adult	24 mm (female)	<ul style="list-style-type: none">● The bags of females are similar to the larvae.● Females within the bag are larva like.● Males have clear wings and a black body with a furry appearance.
Pupa (if applicable)		<ul style="list-style-type: none">● Female pupae similar to larva in appearance.● Male pupae with wing pads.

Type of feeder (Chewing, sucking, etc.): Chewing.

Host/s: Only the larvae feed, neither male nor female adults feed. Larvae are polyphagous and feed on plants including Juniper (*J. virginiana* and *J. communis*), cedar, *T. occidentalis*, and other woody ornamental plants.

Description of Damage (larvae and adults): Defoliation in heavy infestations is common. Larvae can also consume buds, causing branch dieback. Additionally, silk wrapped around a branch can choke it out as it grows, killing the branch.

References:

Cox, D. L., & Potter, D. A. (1986). Aerial dispersal behavior of larval bagworms, *Thyridopteryx ephemeraeformis* (Lepidoptera: Psychidae). *The Canadian Entomologist*, 118(6), 525-536.

Jones, F. M., & Parks, H. B. (1928). The bagworms of Texas. College Station, Texas.

Rhainds, M., Davis, D. R., & Price, P. W. (2009). Bionomics of Bagworms (Lepidoptera: Psychidae). *Annual Review of Entomology*, 54(1), 209-226. doi:10.1146/annurev.ento.54.110807.090448

Shetlar, D. J. (2011, October 05). Bagworm and Its Control. Retrieved from <https://ohioline.osu.edu/factsheet/HYG-2149-10>

Pest Profile



Photo credit: Bernd Thaller, Flickr

Common Name: Four-Lined Silverfish

Scientific Name: *Ctenolepisma lineata*

Order and Family: Zygentoma: Lepismatidae

Size and Appearance:

	Length (mm)	Appearance
Egg	0.8 mm	<ul style="list-style-type: none">● Oval and white.
Larva/Nymph		<ul style="list-style-type: none">● Similar in appearance to adults, but smaller.● Scales develop in later molts (3th or 4th).
Adult	12.8 to 16 mm	<ul style="list-style-type: none">● Three pairs of abdominal styli.● Alternative light and dark bands of scales dorsally.● Long antennae (up to 16.5 mm)

Type of feeder (Chewing, sucking, etc.): Chewing.

Host/s: Four-lined silverfish feed on materials high in cellulose, including paper, cardboard, and wood. These silverfish are capable of digesting cellulose through their own enzymatic activity, independent of gut microbes. This species can be a pest of foods high in carbohydrate content. Outdoor populations are commonly found under the bark of *Eucalyptus* trees.

Description of Damage (larvae and adults):

Four-lined silverfish can damage books and other paper materials. Holes, etched siding and stains from scales and fecal matter can be found on damaged items. This species is primarily considered a nuisance pest.

References:

- Baltanás, R. M., Ricart, M. G., & de Roca, C. B. (2012, January). New data for a revision of the genus *Ctenolepisma* (Zygentoma: Lepismatidae): redescription of *Ctenolepisma lineata* and new status for *Ctenolepisma nicoletii*. In *Annales de la Société entomologique de France* (Vol. 48, No. 1-2, pp. 66-80). Taylor & Francis Group
- Koehler, P. G., Branscome, D., Oi, F. M., & Bayer, B. E. (1993, April). Booklice and Silverfish. Retrieved from <http://edis.ifas.ufl.edu/ig094>
- Lasker, R., & Giese, A. C. (1956). Cellulose digestion by the silverfish *Ctenolepisma lineata*. *Journal of Experimental Biology*, 33(3), 542-553
- Smith, E. H., & Whitman, R. C. (1992). *NPCA field guide to structural pests*. Dunn Loring, VA: NPCA.

Pest Profile



Photo credit: André Karwath, Flickr

Common Name: Fruit Fly

Scientific Name: *Drosophila melanogaster*

Order and Family: Diptera: Drosophilidae

Size and Appearance:

	Length (mm)	Appearance
Egg	0.5 mm	<ul style="list-style-type: none">• The egg is white and oval shaped with two filaments extending for respiration.
Larva/Nymph	7-8 mm (mature larvae)	<ul style="list-style-type: none">• Elongate and wormlike.• Creamy white in color• Small denticles on ventral side of each thoracic and abdominal segment.
Adult	3 mm	<ul style="list-style-type: none">• Small fly.• Red eyes and arista antennae.• Two halteres.
Pupa (if applicable)		<ul style="list-style-type: none">• The pupa begins yellowish-white before transitioning to a darker color.

Type of feeder (Chewing, sucking, etc.): Sponging.

Host/s: Larvae feed on the yeast in decaying fruits, vegetables, fungi, and liquids. Some sources include bananas, grapes, potatoes, pickles, tomatoes, beer, wine, and vinegar. They are also known to feed in slime in and around drains, garbage cans, and dirty brooms, mops, and rags.

Description of Damage (larvae and adults): Larvae and adults can contaminate fruits and vegetables resulting in loss of yield.

References:

Smith, E. H., & Whitman, R. C. (1992). *NPCA field guide to structural pests*. Dunn Loring, VA: NPCA.

Vijayalakshmi, M. (n.d.). *Drosophila melanogaster - Life Cycle*. Reading. Retrieved March 19, 2019, from <https://nptel.ac.in/courses/102106035/Module 2/Lecture 6/Lecture 6.pdf>.

Pest Profile



Photo credit: Creative Commons CC0, Pxhere

Common Name: German Yellow Jacket

Scientific Name: *Vespula germanica*

Order and Family: Hymenoptera: Vespidae

Size and Appearance:

	Length (mm)	Appearance
Egg		
Larva/Nymph		<ul style="list-style-type: none">• Elongated creamy white and legless.
Adult	12 - 17 mm 20 mm (queens)	<ul style="list-style-type: none">• Yellow and black bands on the abdomen.• Black antennae.• Covered in pubescence.• Clypeus (broad plate on head) with three spots.• Black diamond shaped marking on T1 of the abdomen.
Pupa (if applicable)		<ul style="list-style-type: none">• Generally wasp shaped with appendages held close to body.• Creamy white in early development, darkened later in development.• Enclosed in a silken cocoon.

Type of feeder (Chewing, sucking, etc.): Chewing.

Host/s: German yellow jackets hunt for insect prey and will also feed on soft bodied carrion. Workers also feed on aphid honeydew, fruits, carbohydrates, and processed food. This species is a scavenger that is often attracted to human foods.

Description of Damage (larvae and adults): German yellow jackets do not typically cause physical damage, but present a serious stinging risk due to their aggressive defensive behavior near their nests. Nests are often built in wall voids and attics in human structures. As an invasive pest, this species can displace local yellow jacket species and change the local population. Their high rates of predation on orb web spiders, mealworms, and caterpillars can result in local extinction.

References:

- Akre, R. D., Greene, A., MacDonald, J. F., Landolt, P. J., & Davis, H. G. (1981). The yellowjackets of America north of Mexico.
- Jandt, J. M., & Jeanne, R. L. (2005). German Yellowjacket (*Vespula germanica*) Foragers Use Odors Inside the Nest to Find Carbohydrate Food Sources. *Ethology*, 111(7), 641-651. doi:10.1111/j.1439-0310.2005.01088.x
- Kovac, H., & Stabentheiner, A. (2012). Does size matter? – Thermoregulation of ‘heavyweight’ and ‘lightweight’ wasps (*Vespa crabro* and *Vespula* sp.). *Biology Open*, 1-9.
- Sackmann, P., Rabinovich, M., & Corley, J. C. (2001). Successful removal of German yellowjackets (Hymenoptera: Vespidae) by toxic baiting. *Journal of economic entomology*, 94(4), 811-816.
- Smith, E. H., & Whitman, R. C. (1992). *NPCA field guide to structural pests*. Dunn Loring, VA: NPCA.
- Vespula germanica*. (2006, November 11). Retrieved from <http://www.iucngisd.org/gisd/species.php?sc=896>

Pest Profile



Photo credit: Bj.schoenmakers, Wikimedia

Common Name: Gray Silverfish

Scientific Name: *Ctenolepisma longicaudata*

Order and Family: Zygentoma: Lepismatidae

Size and Appearance:

	Length (mm)	Appearance
Egg	0.8 mm	<ul style="list-style-type: none">● Oval and white in color.
Larva/Nymph		<ul style="list-style-type: none">● Similar in appearance to the adults, but lacking setae in first instar and scales in instars 1 - 3.● Genitalia lacking in instars 1 - 13, appearing in 14th instar.
Adult	19 mm	<ul style="list-style-type: none">● Teardropped shaped, with thorax widened.● Scales uniformly gray.● Two pairs of styli.● Three long appendages on apex of abdomen.

Type of feeder (Chewing, sucking, etc.): Chewing

Host/s: The gray silverfish contains cellulose digesting bacteria and enzymes in its midgut, allowing it to digest food containing cellulose. Typical sources of food include paper, glue in book bindings, museum collections, wheat flour, beef extracts, tissue paper, onion skins, artificial silk, linen, rayon, lisle, and cotton. They readily feed on proteins and carbohydrates from both plants and animals.

Description of Damage (larvae and adults): Damage can be identified by small, irregular holes or discoloration of paper.

References:

Koehler, P. G., Branscome, D., Oi, F. M., & Bayer, B. E. (1993, April). Booklice and Silverfish. Retrieved from <http://edis.ifas.ufl.edu/ig094>

Kulma, M., Vrabec, V., Patoka, J., & Rettich, F. (2018). The first established population of the invasive silverfish *Ctenolepisma longicaudata* (Escherich) in the Czech Republic. *BioInvasions Records*, 7(3), 329-333.

Rust, M. K., & Millard, M. R. (2009, December). How to Manage Pests. Retrieved from <http://ipm.ucanr.edu/PMG/PESTNOTES/pn7475.html>

Smith, E. H., & Whitman, R. C. (1992). *NPCA field guide to structural pests*. Dunn Loring, VA: NPCA.

Pest Profile



Photo credit: Judy Gallagher, Flickr

Common Name: Great Golden Digger Wasp or Great Golden Sand Digger

Scientific Name: *Sphex ichneumoneus*

Order and Family: Hymenoptera: Sphecidae

Size and Appearance:

	Length (mm)	Appearance
Egg		
Larva/Nymph		
Adult	19-23 mm	<ul style="list-style-type: none">● Proximal segments of abdomen are orange. Distal segments black.● The head and thorax have short golden hairs.● Wings dark to clear.
Pupa (if applicable)		

Type of feeder (Chewing, sucking, etc.): Chewing

Host/s: Adults hunt primarily katydids and provision each cell with multiple prey for larvae to feed on. Species include *Conocephalus fasciatus*, *C. attenuatus*, *C. triops*, *Orchelimum vulgare*, *O. calcaratum*, *O. delicatum*, *O. gracile*, *Atlanticus dorsalis*, and *Neoconocephalus ensiger*. Gryllidae and Rhaphidophoridae are also typically hunted.

Description of Damage (larvae and adults): Adults dig holes into soil to build their nests and can sometimes become a nuisance.

References:

Coelho, J. R., & Ladage, L. D. (1999). Foraging capacity of the great golden digger wasp *Sphex ichneumoneus*. *Ecological Entomology*, 24(4), 480-483. doi:10.1046/j.1365-2311.1999.00219.x

Sphex ichneumoneus. (n.d.). Retrieved from [https://www.discoverlife.org/20/q?search=Sphex ichneumoneus](https://www.discoverlife.org/20/q?search=Sphex%20ichneumoneus)

Pest Profile



Photo credit: Erin Maxson, Wikimedia

Common Name: Ground Yellow Jacket

Scientific Name: *Vespula vidua*

Order and Family: Hymenoptera: Vespidae

Size and Appearance:

	Length (mm)	Appearance
Egg		
Larva/Nymph		<ul style="list-style-type: none">• Creamy white and legless.
Adult	10 - 16 mm	<ul style="list-style-type: none">• First abdominal segment black with two yellow spots.• Wings folded longitudinally while at rest.• Black antennae, underside of scape yellow.
Pupa (if applicable)		<ul style="list-style-type: none">• Generally wasp shaped with appendages held close to body.• Creamy white in early development, darkened later in development.• Enclosed in silken cocoon.

Type of feeder (Chewing, sucking, etc.): Chewing.

Host/s: These wasps hunt live prey including tobacco hornworm larvae and other arthropod prey to feed their developing larvae. *Vespula vidua* have been observed around garbage bins and picnics, but appear to be attracted to the odors and do not typically scavenge, although they do occasionally display scavenging behavior. They are not known to scavenge large, motionless objects, such as an animal carcass. Adults receive nourishment from nectar.

Description of Damage (larvae and adults): This wasp does not typically cause damage, however, their presence around human structures can be dangerous as they are capable of stinging and will actively defend their nests.

References:

- Buck, M., Marshall, S. A., & Cheung, D. K. (2008, February 19). Identification Atlas of the Vespidae (Hymenoptera, Aculeata) of the northeastern Nearctic region. Retrieved from https://cjai.biologicalsurvey.ca/bmc_05/key_vespula.html
- Kimsey, L., & Carpenter, J. (2012). The Vespinae of North America (Vespidae, Hymenoptera). *Journal of Hymenoptera Research*, 28, 37-65. doi:10.3897/jhr.28.3514
- Richter, M., & Colvin, C. (1994). *Vespula vidua* Wasps Scavenge Caterpillar Baits. *Journal of the Kansas Entomological Society*, 67(4), 426-428. Retrieved from <http://www.jstor.org.libproxy.unl.edu/stable/25085550>
- Southern Yellowjackets. (n.d.). Retrieved from <https://texasinsects.tamu.edu/southern-yellowjackets/>

Pest Profile



Photo credit: Udo Schmidt, Flickr

Common Name: Hister Beetle or Poultryhouse Pill Beetle

Scientific Name: *Carcinops pumilio*

Order and Family: Coleoptera: Histeridae

Size and Appearance:

	Length (mm)	Appearance
Egg	0.65 - 0.92 mm	<ul style="list-style-type: none">• Elongated oval.• Translucent white.
Larva/Nymph		<ul style="list-style-type: none">• Elongate and cream to yellow colored. Brown head capsule.• A pair of projections on the terminal abdominal segment.
Adult	1.6 - 2.7 mm	<ul style="list-style-type: none">• Shiny black with brownish red legs.• Elytra short, exposing the tip of the abdomen.• The elytra have 14 longitudinal rows of punctures.• Antennae clubbed, short, and elbowed.• Front tibia expanded.
Pupa (if applicable)		<ul style="list-style-type: none">• White but darken to brown and black with development.

Type of feeder (Chewing, sucking, etc.): Chewing.

Host/s: Hister beetles are predators of the house fly (*Musca domestica*) and lesser house fly (*Fannia canicularis*) eggs and larvae, though not of their pupae. They also prey upon other dipterans and acarines.

Description of Damage (larvae and adults): These beetles are not associated with damage and are often used as biological control for pest flies in poultry and egg production facilities.

References:

- Achiano, K. A., & Giliomee, J. H. (2005). Biology of the house fly predator *Carcinops pumilio* (Erichson)(Coleoptera: Histeridae). *BioControl*, 50(6), 899-910.
- Geden, C. J., & Axtell, R. C. (1988). Predation by *Carcinops pumilio* (Coleoptera: Histeridae) and *Macrocheles muscaedomesticae* (Acarina: Macrochelidae) on the House Fly (Diptera: Muscidae): Functional Response, Effects of Temperature, and Availability of Alternative Prey. *Environmental Entomology*, 17(4), 739-744. doi:10.1093/ee/17.4.739
- Geden, C. J., Stoffolano, J. G., & Elkinton, J. S. (1987). Prey-mediated Dispersal Behavior of *Carcinops pumilio* (Coleoptera: Histeridae). *Environmental Entomology*, 16(2), 415-419. doi:10.1093/ee/16.2.415
- Moore, M. R., & Kaufman, P. E. (2017, February). A Hister Beetle. Retrieved from http://entnemdept.ufl.edu/creatures/beneficial/beetles/Carcinops_pumilio.htm
- White, R. E. (1983). *Beetles: Peterson Field Guide*. Houghton Mifflin Company.

Pest Profile



Photo credit: Graham Snodgrass, Army.mil

Common Name: Kissing Bug

Scientific Name: *Triatoma sanguisuga*

Order and Family: Hemiptera: Reduviidae

Size and Appearance:

	Length (mm)	Appearance
Egg	1.5 mm	<ul style="list-style-type: none">• Oval and white.
Larva/Nymph		<ul style="list-style-type: none">• Similar in appearance to the adult but without fully developed wings.
Adult	18 - 24 mm	<ul style="list-style-type: none">• Cone like mouthpart.• Dark brown to black body.• Edge of abdomen exposed around wings with 6 red stripes on each side.• Wings with reddish-orange spots.

Type of feeder (Chewing, sucking, etc.): Piercing-sucking mouthparts.

Host/s: Kissing bugs feed on the blood of vertebrate hosts including frogs, chickens, raccoons, horses, dogs, cats, armadillos, opossums, and rats. Kissing bugs also feed on humans and are known to bite the face.

Description of Damage (larvae and adults): In some people, bites can cause swelling and itching. However, the more serious concern with bites is the potential transmission of Chagas disease. Chagas

disease can occur in the acute phase and the chronic phase. In the acute phase, symptoms can include fever, fatigue, aches, rash, headaches, diarrhea, and vomiting. Acute phase rarely leads to death. In chronic phase, symptoms include cardiac and gastrointestinal complications.

References:

Byron, M. A., & Capinera, J. L. (2013, November). Eastern Bloodsucking Conenose. Retrieved from https://entnemdept.ifas.ufl.edu/creatures/URBAN/Triatoma_sanguisuga.htm

CDC - Chagas - General Information - Triatomine Bug FAQs - Triatoma sanguisuga. (n.d.). Retrieved from https://www.cdc.gov/parasites/chagas/gen_info/vectors/t_sanguisuga.html

Smith, E. H., & Whitman, R. C. (1992). *NPCA field guide to structural pests*. Dunn Loring, VA: NPCA.

Waleckx, E., Suarez, J., Richards, B., & Dorn, P. L. (2014). Triatoma sanguisuga blood meals and potential for Chagas disease, Louisiana, USA. *Emerging infectious diseases*, 20(12), 2141

Pest Profile



Photo credit: Udo Schmidt, Flickr

Common Name: Larder Beetle

Scientific Name: *Dermestes lardarius*

Order and Family: Coleoptera: Dermestidae

Size and Appearance:

	Length (mm)	Appearance
Egg		
Larva/Nymph	10 - 15 mm	<ul style="list-style-type: none">● Elongated and covered in brown setae.● Brown in color.● Two backwards curving urogomphi (projections) on the 9th abdominal segment.
Adult	7 - 9 mm	<ul style="list-style-type: none">● Dark brown with a yellow transverse band across the elytra.● Three spots on each elytra within the yellow band.● Antennae are short and clubbed.● Legs and underside of abdomen covered in fine, yellow hairs.
Pupa (if applicable)		

Type of feeder (Chewing, sucking, etc.): Chewing.

Host/s: *Dermestes lardarius* feed on carrion and other animal products including dried specimens, pet food, meat, cheese, dried fish, hides, feathers, and hair. Dead insects in walls are a source of food for the larvae which can become problematic for homeowners.

Description of Damage (larvae and adults): Damage is characterized by holes cut into the inner surface and loosened hair by larval feeding. Larvae also leave cast molts and fecal pellets on the surface. When *Dermestes lardarius* is ready to pupate, it burrows into solid surfaces, including wood, and blocks the opening with its final molt skin.

References:

Jacobs, S., Sr. (2013, January). Larder Beetle. Retrieved from
<https://ento.psu.edu/extension/factsheets/larder-beetle>

Smith, E. H., & Whitman, R. C. (1992). *NPCA field guide to structural pests*. Dunn Loring, VA: NPCA.

Pest Profile



Photo credit: Aprile Nobile, AntWeb

Common Name: Larger Yellow Ant

Scientific Name: *Lasius interjectus*

Order and Family: Hymenoptera: Formicidae

Size and Appearance:

	Length (mm)	Appearance
Egg		
Larva/Nymph		
Adult	2.5 - 4.5 mm (workers) 5 mm (queen) 3.25 mm (males)	<ul style="list-style-type: none">• 12 segmented antennae with pedicel (2nd segment) longer than width of head.• One pointed node on petiole.• Hairs on abdomen, thorax, and head.• Yellowish to reddish-brown in color.
Pupa (if applicable)		

Type of feeder (Chewing, sucking, etc.): Chewing

Host/s: Larger yellow ants feed on honeydew produced by subterranean root aphids and cocoids including scale insects and mealybugs. One species of mealybug found within a colony is *Trionymus interjecti*. These ants have not been observed foraging for other food sources.

Description of Damage (larvae and adults): These ants do not typically cause damage, however, they are indicative of existing structural problems. *Lasius interjectus* may be found in rotting wood in a home or commercial building. They often nest under stones or pavement along the foundation of a structure and can be found wandering inside.

References:

Bueker, E. D. (1931). Two new mealy-bugs (Coccidae) in nests of ants (*Lasius*). American Museum novitates; no. 453.

Jacobs, S. (2014). [*Citronella ants. Entomological Notes.*](#), Department of Entomology, College of Agricultural Sciences, The Pennsylvania State University.

Smith, E. H., & Whitman, R. C. (1992). *NPCA field guide to structural pests*. Dunn Loring, VA: NPCA.

Pest Profile



Photo credit: Janet Graham, Flickr

Common Name: Lesser House Fly or Little House Fly

Scientific Name: *Fannia canicularis*

Order and Family: Diptera: Fanniidae

Size and Appearance:

	Length (mm)	Appearance
Egg	0.8 - 2 mm	<ul style="list-style-type: none">• Small and white.• Pair of dorsal flanges.
Larva/Nymph	1.5 mm (first instar) 3 mm (second instar) 6 - 7 mm (third instar)	<ul style="list-style-type: none">• Maggot-like with wispy spines.• Early instars white, later developing a light brown color.
Adult	3.5 - 6 mm	<ul style="list-style-type: none">• Similar in appearance to the typical house fly, but smaller.• Pair of yellow halteres.• Thorax with three longitudinal stripes.• Abdomen yellowish with brown markings.
Pupa (if applicable)		<ul style="list-style-type: none">• Darkened brown.• Similar in appearance to the third instar larvae.

Type of feeder (Chewing, sucking, etc.): Sponging

Host/s: Larvae feed on decomposing organic material. Food sources include dung, rotting fruit and vegetables, rotting wood and fungi, nests of insects, birds, and mammals, dead animals and decaying seaweed. The presence of larvae on corpses is helpful for crime scene investigations. Larvae can also be found feeding in feces, including cow, pig, horse, calf, and human.

Description of Damage (larvae and adults): Larvae have been implicated in cases of myiasis (infestation of wounds). Adults are potential carriers of disease as they often visit carrion and feces. In addition to serious health concerns, adults are considered nuisance pests indoors.

References:

Deal, A. S. (1967). *The effect of temperature and moisture on the development of Fannia canicularis (L.) and Fannia femoralis (Stein), (Diptera: Muscidae)* (Doctoral dissertation, The Ohio State University)

Gerry, A. C. (2015, April). How to Manage Pests. Retrieved from <http://ipm.ucanr.edu/PMG/PESTNOTES/pn7457.html>

Steve, P. C. (1960). Biology and Control of the Little House Fly, *Fannia canicularis*, in Massachusetts1. *Journal of Economic Entomology*, 53(6), 999-1004. doi:10.1093/jee/53.6.999

Pest Profile



Photo credit: Andy Reago & Chrissy McClarren, Flickr

Common Name: Margined Blister Beetle

Scientific Name: *Epicauta funebris*

Order and Family: Coleoptera: Meloidae

Size and Appearance:

	Length (mm)	Appearance
Egg		
Larva/Nymph	13 mm	<ul style="list-style-type: none">• Long legs and mobile in the first instar.
Adult	11 - 18 mm	<ul style="list-style-type: none">• Black with gold wing margins.• Covered with black pubescence.• Pronotum longer than broad.
Pupa (if applicable)		

Type of feeder (Chewing, sucking, etc.): Chewing

Host/s: Adults feed on plants including leaves of the families Amaranthaceae, Apocynaceae, Fabaceae, and Solanaceae. Specific plants included are alfalfa, beet, eggplant, potato, soybean, sugar beet and tomato. Larvae feed on grasshopper eggs.

Description of Damage (larvae and adults): Adult beetles can cause significant crop damage by feeding on the leaves, leaving behind the veins. These beetles are gregarious and can inflict major damage in

small areas. Contamination of cantharidin on plants consumed or touched by animals can lead to blistering.

References:

- Capinera, J. L. (2003, January). Striped Blister Beetle. Retrieved from http://entnemdept.ufl.edu/creatures/veg/potato/striped_blister_beetle.htm
- Carrel, J. E., McCairel, M. H., Slagle, A. J., Doom, J. P., Brill, J., & McCormick, J. P. (1993). Cantharidin production in a blister beetle. *Experientia*, 49(2), 171-174.
- Selander, R. B., & Fasulo, T. R. (2000). Blister Beetles (Insecta: Coleoptera: Meloidae). *IFAS Extension*.
- Watson, W., Orr, D., & Bambara, S. Blister Beetles of Hay and Forages in North Carolina.

Pest Profile



Photo credit: Wim Rubers, Waarneming.nl (adult); Chiswick Chap, Wikimedia (nymph)

Common Name: Masked Hunter

Scientific Name: *Reduvius personatus*

Order and Family: Hemiptera: Reduviidae

Size and Appearance:

	Length (mm)	Appearance
Egg	1 mm (long) 0.4 mm (wide)	<ul style="list-style-type: none">● Oval in shape.● Shiny brownish-yellow.
Larva/Nymph	2 - 3 mm (1st instar) 3.5 - 4.5 mm (2nd instar) 6 - 7 mm (3rd instar) 8 - 9 mm (4th instar) 12 - 14 mm (5th instar)	<ul style="list-style-type: none">● Nymphs covered in dust and other particles.● Dark setae on legs and antennae.● 1st instar white, color darkens in subsequent instars.● Five dark spots on margins of abdominal segment 2-6 on the 4th instar.
Adult	17 - 21 mm	<ul style="list-style-type: none">● Shiny brownish - black color.● Dark setae on legs and antennae.● Antennae 4 segmented and filiform.

Type of feeder (Chewing, sucking, etc.): Piercing-sucking

Host/s: Masked hunter nymphs and adults feed on larvae and adult arthropods including Syrphidae, *Calliphora* spp., *Rollenia rudis*, dermestids, ticks, and Lepidopterans.

Description of Damage (larvae and adults): Masked hunters do not typically cause damage, but are capable of inflicting a painful bite if mishandled.

References:

- Jacobs, S., Sr. (2006, January). Masked Hunter (Department of Entomology). Retrieved from <https://ento.psu.edu/extension/factsheets/masked-hunter>
- Javahery, M. (2013). Natural history of *Reduvius personatus* Linnaeus (Hemiptera: Heteroptera: Reduviidae) in North America. *Munis Entomology & Zoology*, 8(2), 685-703.
- Scudder, G. G. E. (1992). The distribution and life cycle of *Reduvius personatus* (L.)(Hemiptera: Reduviidae) in Canada. *Journal of the Entomological Society of British Columbia*, 89, 38-42.
- Smith, E. H., & Whitman, R. C. (1992). *NPCA field guide to structural pests*. Dunn Loring, VA: NPCA.

Pest Profile



Photo credit: Robert Webster (Xpda), Wikimedia

Common Name: Orchard Mason Bee

Scientific Name: *Osmia lignaria*

Order and Family: Hymenoptera: Megachilidae

Size and Appearance:

	Length (mm)	Appearance
Egg	1.4 - 4 mm	<ul style="list-style-type: none">● Elongated and white.
Larva/Nymph	12 - 17 mm	<ul style="list-style-type: none">● Maggot-like and white.
Adult	11 - 14 mm	<ul style="list-style-type: none">● Metallic dark blue to blue-green.● Males with a patch of white hair on face, females without.● Males with long antennal segments used in identification.● Females identified by deep median emargination on clypeus (broad plate on head).● Body covered in pubescence.
Pupa (if applicable)	12 - 14 mm (female) 10 - 12 mm (male)	<ul style="list-style-type: none">● Dark brown, silkened cocoon.● Oval with nipple-like bump on the apical end.● Pupa within cocoon similar in appearance to adult, but without developed wings.

Type of feeder (Chewing, sucking, etc.): Chewing

Host/s: *Osmia lignaria* are important pollinators for a number of plants, including horticultural and agricultural crops. Crops include apple, pear, almond, blueberry, and cherry. The following plant families are pollinated by *Osmia lignaria*; Brassicaceae, Ericaceae, Fabaceae, Grossulariaceae, Hydrophyllaceae, Limnanthaceae, Liliaceae, Ranunculaceae, Rhamnaceae, Rosaceae, and Salicaceae.

Description of Damage (larvae and adults): While these bees do not cause damage, they nest in existing holes occasionally found on human structures. This can put them in contact with people and while they are not aggressive, they can sting if mishandled.

References:

Bosch, J., & Kemp, W. P. (2000). Development and emergence of the orchard pollinator *Osmia lignaria* (Hymenoptera: Megachilidae). *Environmental Entomology*, 29(1), 8-13.

Bosch, J., & Kemp, W. P. (2001). *How to manage the blue orchard bee as an orchard pollinator*. Sustainable Agriculture Network/National Agricultural Library.

Estep, A., Zettel-Nalen, C., & Ellis, J. D. (2013, February). Blue Orchard Bee. Retrieved from https://entnemdept.ifas.ufl.edu/creatures/MISC/BEES/blue_orchard_bee.htm

Pest Profile



Photo credit: Judy Gallagher, Flickr

Common Name: Northern Paper Wasp

Scientific Name: *Polistes fuscatus*

Order and Family: Hymenoptera: Vespidae

Size and Appearance:

	Length (mm)	Appearance
Egg		
Larva/Nymph		
Adult	16 - 20 mm 11 - 17 mm (wingspan)	<ul style="list-style-type: none">• Color and markings are highly variable in this species with combinations of black, red, yellow and brown.• Appearance is dependent on regions where they occur.• Darkening of the 4-5 apical flagellomeres.
Pupa (if applicable)		

Type of feeder (Chewing, sucking, etc.): Chewing.

Host/s: Adults hunt soft bodied insects including caterpillars and orthopterans to provide food for larvae. Adults get nourishment from nectar.

Description of Damage (larvae and adults): Northern paper wasps do not typically cause damage, but often build nests on buildings and homes which may appear unsightly and require removal. Additionally, *P. fuscatus* are capable of stinging and will defend their nest if threatened.

References:

Grewal, K. (2002). *Polistes fuscatus*. Retrieved from
https://animaldiversity.org/accounts/Polistes_fuscatus/

Krombein, K. V. (1979). *Catalog of Hymenoptera in America North of Mexico: Symphyta and Apocrita (Parasitica)* (Vol. 1). Smithsonian Institution Press

Tibbetts, E. A. (2002). Visual signals of individual identity in the wasp *Polistes fuscatus*. *Proceedings of the Royal Society of London. Series B: Biological Sciences*, 269(1499), 1423-1428.
doi:10.1098/rspb.2002.2031

Pest Profile



Photo credit: Udo Schmidt, Flickr

Common Name: Old House Borer

Scientific Name: *Hylotrupes bajulus*

Order and Family: Coleoptera: Cerambycidae

Size and Appearance:

	Length (mm)	Appearance
Egg		
Larva/Nymph	20 - 40 mm	<ul style="list-style-type: none">● Cylindrical body tapering on posterior end.● Creamy white with dark mouthparts.● Segments of abdomen slightly constricted.● A pair of rows of three black ocelli.● Short, 4 segmented legs.
Adult	15 - 25 mm	<ul style="list-style-type: none">● Brownish-black.● 11 segmented antennae, $\frac{1}{3}$ body length or longer.● 5 segmented tarsi● Gray pubescence on body.● Raised ridge on pronotum with one shiny black bump on each side.
Pupa (if applicable)		

Type of feeder (Chewing, sucking, etc.): Chewing

Host/s: The sapwood of seasoned pine and other softwoods are infested. Moisture content between 10 - 28% is ideal for development and wood under 10 years old is more often attacked, however older wood is also attacked.

Description of Damage (larvae and adults): Extensive galleries created by larvae over a long period of time can lead to serious structural damage. Infested materials are often already damaged by wood-decay fungi. Exit holes are oval and about 6.5 - 10 mm in diameter. Tunnels begin about 2.4 - 4.9 mm in and then curves in any direction. Frass is fine, tightly packed into galleries and contains blunt ended pellets.

References:

Bennett, G. W., Owens, J. M., Corrigan, R. M., & Truman, L. C. (2016). *Truman's scientific guide to pest management operations*. Cleveland, OH: North Coast Media, LLC.

Old House Borer. (2013). [Fact Sheet]. Retrieved from <https://museumpests.net/wp-content/uploads/2014/03/Old-House-Borer.pdf>

Smith, E. H., & Whitman, R. C. (1992). *NPCA field guide to structural pests*. Dunn Loring, VA: NPCA.

Pest Profile



Photo credit: Sarefo, Wikimedia

Common Name: Powderpost Beetle

Scientific Name: Various. Representative species include *Lyctus planicollis*, *L. cavicollis*, *L. brunneus*, *L. linearis*, and *Trogoxylon parallelopipedus*.

Order and Family: Coleoptera, Bostrichidae (Lyctinae)

Size and Appearance: Size and appearance is variable, but with a general form.

	Length (mm)	Appearance
Egg	0.5 - 1.2 mm	<ul style="list-style-type: none">● Cylindrical and white.
Larva/Nymph	6 mm	<ul style="list-style-type: none">● White body with a brown head.● Enlarged thorax in relation to body.● Small, short legs and 4-segmented antennae.
Adult	1 - 7 mm	<ul style="list-style-type: none">● Color varies from black to reddish-brown.● Elongated and flattened body.● Clubbed antennae.● Elytra with longitudinal grooves and rows of setae.● Tarsi 5-5-4.
Pupa (if applicable)		

Type of feeder (Chewing, sucking, etc.): Chewing

Host/s: Larvae and adults bore into seasoned, porous hardwood between 8 - 32 percent humidity and starch content higher than 3 percent. Trees with larger pores, including ash, elm, pecan and walnut are more susceptible. Other commonly attacked trees are hickory, oak, and bamboo. Additionally, they can damaged unpainted or untreated wood used in flooring, tool handles, or other items with wood

Description of Damage (larvae and adults): Damage is characterized by the presence of round exit holes approximately 0.8 to 1.6 mm in diameter. Damage is not typically structural, but extensive galleries can weaken the integrity of some wooden objects. Fine, powdery frass is often found beneath and around the holes. The frass is loose and not packed into the holes unlike some other wood boring beetles.

References:

Bennett, G. W., Owens, J. M., Corrigan, R. M., & Truman, L. C. (2016). *Truman's scientific guide to pest management operations*. Cleveland, OH: North Coast Media, LLC.

Rosel, A. (1969). Oviposition, Egg Development And Other Features Of The Biology Of Five Species Of Lyctidae (Coleoptera). *Australian Journal of Entomology*, 8(2), 145-152. doi:10.1111/j.1440-6055.1969.tb00750.x

Smith, E. H., & Whitman, R. C. (1992). *NPCA field guide to structural pests*. Dunn Loring, VA: NPCA.

White, R. E. (1983). *Beetles: Peterson Field Guide*. Houghton Mifflin Company.

Pest Profile



Photo credit: Udo Schmidt, Flickr

Common Name: Rove Beetle

Scientific Name: Various species, including *Creophilus spp.*, *Platydracus spp.*, *Philonthus spp.*, and *Paederus spp.*

Order and Family: Coleoptera: Staphylinidae

Size and Appearance: Rove beetles are one of the most diverse families of beetles and thus, size and appearance can vary considerably.

	Length (mm)	Appearance
Egg		<ul style="list-style-type: none">• Variable, but usually white and spherical, oval, or pear shaped.
Larva/Nymph	Up to 15 mm	<ul style="list-style-type: none">• Variable, but typically slender, flattened body.• Brown to pale in color• Sclerotized head
Adult	1 - 44 mm	<ul style="list-style-type: none">• Black or brown.• Typically with short elytra exposing most segments of the abdomen, although there are exceptions.• Antennae variable; usually 11 antennomeres, may be filiform, clubbed, or geniculate.• The abdomen is usually quite flexible and can bend in many directions. The abdomen of some species can telescope to appear shorter or longer.
Pupa (if applicable)	Up to 13 mm	<ul style="list-style-type: none">• Pupae dark and sclerotized or light and unsclerotized depending on the species.

Type of feeder (Chewing, sucking, etc.): Both larvae and adults have chewing mouthparts.

Host/s: Rove beetles have evolved to occupy many niches and are extremely varied in diet. Many species are predators of other insects, including mosquito larvae, mites, nematodes, caterpillars, and

scarab beetles. Some species are specialized while others are generalists. Rove beetles can be found in and around dead animals, likely scavenging on other insects. They can be helpful in forensic cases. Numerous rove beetle species have also been found feeding on fungi. Phytophagy is also present in a number of species across various genera, which includes the consumption of floral tissue. Additionally, at least one genus includes parasitoids of fly puparia.

Description of Damage (larvae and adults): Rove beetles do not typically cause damage and are not considered a nuisance. However, various species in New Mexico are capable of damaging golf turf after burrowing into the ground.

References:

Frank, J. H., & Thomas, M. C. (1999, September). Rove beetles (of the world). Retrieved from https://entnemdept.ifas.ufl.edu/creatures/misc/beetles/rove_beetles.htm

Sutherland, C. A., (2006, October). Rove Beetles. New Mexico State University.

Pest Profile



Photo credit: Robert Webster (Xpda), Wikimedia

Common Name: Smaller Carpenter Ant

Scientific Name: *Camponotus nearcticus*

Order and Family: Hymenoptera: Formicidae

Size and Appearance:

	Length (mm)	Appearance
Egg		
Larva/Nymph		
Adult	5.5 - 7.5 mm (major worker) 4 - 5.5 mm (minor worker) 8 - 9 mm (female) 5.5 - 7 mm (male)	<ul style="list-style-type: none">● Black abdomen and brown to black head and thorax.● Few hairs on thorax, abdomen, and petiole.
Pupa (if applicable)		

Type of feeder (Chewing, sucking, etc.): Chewing

Host/s: Smaller carpenter ants are an arboreal species of carpenter ant. Typical hosts include oaks, chestnuts, common elder (*Sambucus canadensis*), pitch pine (*Pinus rigida*) and occasionally the old, fallen cones from this tree. Feeding habits include sweet and sugary foods.

Description of Damage (larvae and adults): Like most carpenter ant species, *C. nearcticus* build galleries in their hosts, removing wood material. Not typically structurally damaging; however, their presence can indicate water damaged wood. Smaller carpenter ants can nest indoors and become a nuisance for inhabitants. Damage of furniture has also been documented. These ants have also been found contaminating consumable foods.

References:

- Adusei-Mensah, F., Inkum, I. E., Agbale, A. C., & Eric, A. (2014). Comparative Evaluation of the Insecticidal and Insect Repellent Properties of the Volatile Oils of Citrus Aurantifolia (Lime), Citrus Sinensis (Sweet Orange) and Citrus Limon (Lemon) On Camponotus Nearcticus (Carpenter Ants). *Nov. J*, 1, 19-25.
- Gregg, R. E. (1973). A New Species of Camponotus (Hymenoptera: Formicidae) from Nevada. *The Southwestern Naturalist*, 18(1), 39. doi:10.2307/3669909
- Smith, E. H., & Whitman, R. C. (1992). *NPCA field guide to structural pests*. Dunn Loring, VA: NPCA.
- Wheeler, W. (1910). The North American Forms of Camponotus fallax Nylander. *Journal of the New York Entomological Society*, 18(4), 216-232. Retrieved from <http://www.jstor.org/stable/25003428>

Pest Profile



Photo credit: Katja Schulz, Flickr

Common Name: Spider Beetle

Scientific Name: Various species

Order and Family: Coleoptera, Ptinidae

Size and Appearance:

	Length (mm)	Appearance
Egg		
Larva/Nymph	3 - 5 mm	<ul style="list-style-type: none">• White and C shaped.• Three pairs of legs ending in a single claw.• Legs 3 - 5 segments.
Adult	1 - 5 mm	<ul style="list-style-type: none">• Usually with a large globular abdomen.• Long and thin legs and antennae.• Color variable depending on species. Brownish-yellow red, black, or bi-color.
Pupa (if applicable)	4 mm	<ul style="list-style-type: none">• Enclosed in silken cocoons sometimes with substrate incorporated or embedded in food source.

Type of feeder (Chewing, sucking, etc.): Chewing

Host/s: Generally, spider beetles are scavengers and secondary pests, feeding on both animal and plant sources. Examples of food sources include wool, hair, feathers, animal carcasses, rodent droppings, drugs, roots, grain, seeds, dried fruits, meats, mushrooms, and books. Spider beetles are occasional stored product pests and are usually an indicator of poor sanitation.

Description of Damage (larvae and adults): Feeding by large infestations can leave a matted surface from their mucous feeding shelters and pupal cocoons. Chewing can result in oval holes 1 - 2 mm in diameter in packaging. The presence of larvae, cocoons, dead bodies, and frass in food can also diminish the quality of the food. Larvae can damage wooden structures when burrowing to pupate.

References:

Rees, D. P. (2004). *Insects of stored products*. Csiro Publishing.

Smith, E. H., & Whitman, R. C. (1992). *NPCA field guide to structural pests*. Dunn Loring, VA: NPCA.

Spider Beetle. (n.d.). Retrieved from <https://hortnews.extension.iastate.edu/spider-beetle>

Spilman, T. J. (1991). SPIDER BEETLES (PTINIDAE, COLEOPTERA). *Insect and Mite Pests in Food: An Illustrated Key*, (655), 137

Pest Profile



Photo credit: Robert Webster (Xpda), Wikimedia

Common Name: Striped Blister Beetle

Scientific Name: *Epicauta vittata*

Order and Family: Coleoptera: Meloidae

Size and Appearance:

	Length (mm)	Appearance
Egg	1.4 - 2.1 mm (long) 0.7 mm (wide)	<ul style="list-style-type: none">• White and elongated.
Larva/Nymph		<ul style="list-style-type: none">• Long legs and mobile in the first instar.• White in color for first instar.• Legs reduced in size in subsequent instars.• Later instars reddish brown. Dark brown bands on the thorax and abdomen.
Adult	9 - 17 mm	<ul style="list-style-type: none">• Elongated body with thorax narrower than head and abdomen.• Yellowish-orange in color.• Two to three black stripes on the elytra.• Two black stripes on the head.• Two black stripes on the thorax.• Hindwings transparent.

Pupa (if applicable)		<ul style="list-style-type: none"> • White in color but darkens during development. • Similar in appearance to the adult form, but wings and legs held tightly to the body.
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Type of feeder (Chewing, sucking, etc.): Chewing

Host/s: Adults feed on a variety of plants including bean, beet, carrot, cabbage, corn, eggplant, melon, mustard, pea, pepper, potato, radish, spinach, squash, sweet potato, tomato, clover, soybean, and pigweed. Larvae feed on grasshopper eggs.

Description of Damage (larvae and adults): Striped blister beetles damage the leaves of many common crops by defoliation, especially in aggregations. This species has been implicated in the transmission of bean pod mottle virus in soybean which leads to yellow mottling in upper leaves and yield loss. Contamination of cantharidin on plants consumed or touched by animals can lead to blistering.

References:

- Agafitei, N., & Selander, R. (1980). First Instar Larvae of the Vittata Group of the Genus *Epicauta* (Coleoptera: Meloidae). *Journal of the Kansas Entomological Society*, 53(1), 1-26. Retrieved from <http://www.jstor.org.libproxy.unl.edu/stable/25084003>
- Capinera, J. (2001). *Handbook of vegetable pests*. Elsevier.
- Capinera, J. L. (2003, January). Striped Blister Beetle. Retrieved from http://entnemdept.ufl.edu/creatures/veg/potato/striped_blistar_beetle.htm
- Mabry, T. R., Hobbs, H. A., Steinlage, T. A., Johnson, B. B., Pedersen, W. L., Spencer, J. L., ... & Hartman, G. L. (2003). Distribution of leaf-feeding beetles and Bean pod mottle virus (BPMV) in Illinois and transmission of BPMV in soybean. *Plant disease*, 87(10), 1221-1225.

Pest Profile



Photo credit: Steve Kerr, inaturalist

Common Name: Surinam Cockroach

Scientific Name: *Pycnoscelus surinamensis*

Order and Family: Blattodea: Blaberidae, various species

Size and Appearance:

	Length (mm)	Appearance
Egg	12 - 15 mm (ootheca)	<ul style="list-style-type: none">● Crescent shaped with indentations.● Light colored.
Larva/Nymph	4.5 mm (1st instar)	<ul style="list-style-type: none">● Anterior abdominal segments are shiny black, posterior abdominal segments are dull black.
Adult	18 - 25 mm	<ul style="list-style-type: none">● Black body with shiny brown wings.● Light brown forewings.● Fully developed wings extending beyond abdomen.

Type of feeder (Chewing, sucking, etc.): Chewing

Host/s: Surinam cockroaches are known to feed on pineapple, potato, rose and lily bark, and other plants, especially in greenhouses. They can cause considerable damage to some of the aforementioned plants.

Description of Damage (larvae and adults): *Pycnoscelus surinamensis* are intermediate hosts of the poultry eye worm which are parasitic nematodes that infect poultry.

References:

- Brenner, R. J., & Kramer, R. D. (2019). Cockroaches (Blattaria). In *Medical and Veterinary Entomology* (pp. 61-77). Academic Press.
- Schwabe, C. W. (1949). Observations on the life history of *Pycnoscelus surinamensis* (Linn.), the intermediate host of the chicken eyeworm in Hawaii. *Proceedings of the Hawaiian Entomological Society*, 13(3), 433-436.
- Smith, E. H., & Whitman, R. C. (1992). *NPCA field guide to structural pests*. Dunn Loring, VA: NPCA.

Pest Profile



Photo credit: CSIRO, Wikipedia

Common Name: Warehouse Beetle

Scientific Name: *Trogoderma variabile*

Order and Family: Coleoptera: Dermestidae

Size and Appearance:

	Length (mm)	Appearance
Egg		
Larva/Nymph	6.3 mm long 3.2 mm wide	<ul style="list-style-type: none">• Yellowish white progressively to brown after each molt.• Elongated and covered in setae.
Adult	3.2 mm	<ul style="list-style-type: none">• Oval shaped.• Dark pronotum.• Brownish black with yellow and brown markings dorsally.• Short, clubbed antennae.
Pupa (if applicable)		

Type of feeder (Chewing, sucking, etc.): Chewing

Host/s: Typically found in stored food products including cocoa, cereals, corn, dog food, macaroni, oats, potato chips, rice, spices, yeast, canola, and candy, nuts, seeds and other high protein foods. Larvae also feed on dead animals and insect collections.

Description of Damage (larvae and adults): Larvae are external feeders so the exterior of the food product receives the brunt of the damage. The presence of larval molt and larvae in stored food

products can cause intestinal irritation due to the bristles/setae found on these insects. These might include hastisetae (spear-headed) and spicisetae (sharp-pointed, scaly).

References:

Bennett, G. W., Owens, J. M., Corrigan, R. M., & Truman, L. C. (2016). *Truman's scientific guide to pest management operations*. Cleveland, OH: North Coast Media, LLC.

Gerken, A. R., & Campbell, J. F. (2018). Life history changes in *Trogoderma variabile* and *T. inclusum* due to mating delay with implications for mating disruption as a management tactic. *Ecology and evolution*, 8(5), 2428-2439.

Old House Borer. (2013). [Fact Sheet]. Retrieved from <https://museumpests.net/wp-content/uploads/2014/03/Old-House-Borer.pdf>

Rees, D. P., Starick, N., & Wright, E. J. (2003). Current status of the warehouse beetle *Trogoderma variabile* (Coleoptera: Dermestidae) as a pest of grain storage in Australia. *Wright, EJ, Webb, MC & Highley, E*, 119-121.

Pest Profile



Photo credit: Aiwok, Wikimedia

Common Name: Webbing Clothes Moth or Common Clothes Moth

Scientific Name: *Tineola bisselliella*

Order and Family: Lepidoptera: Tineidae

Size and Appearance:

	Length (mm)	Appearance
Egg	0.5 - 0.3 mm	<ul style="list-style-type: none">Eggs are white and about the size of a pinhead.
Larva/Nymph	7 - 9 mm	<ul style="list-style-type: none">Brown head capsule with a milky yellowish-white body.The larvae construct silken tubes, incorporating substrate.
Adult	5 - 8 mm	<ul style="list-style-type: none">Yellowish to grayish-yellow fringed, lanceolate (oval shape tapering at end) wings. Wingspan of 9 to 16 mm.
Pupa (if applicable)	4 - 7 mm	<ul style="list-style-type: none">Early in development, the pupa is creamy white to yellow. Later in development, the head is yellowish brown with black eyes and the abdomen is tan. The abdomen is mobile.

Type of feeder (Chewing, sucking, etc.): Larvae have chewing mouthparts. Adults do not feed.

Host/s: *Tineola bisselliella* are capable of digesting keratin, allowing them to exploit furs, hides, wool, hair, feathers, and items constructed with these materials. In some cases, *T. bisselliella* have been found feeding on mummified corpses as well as other dried protein-rich meals and cereals. Larvae require Vitamin B in order to develop and are not typically successful on thoroughly cleaned materials.

Description of Damage (larvae and adults): Larvae are solely responsible for damage and even limited feeding can ruin the material. Damage is characterized by various sizes and shapes of holes in material and the clearing of the base of hairs, feathers, and fibers, resulting in them falling out. Fecal staining and webbing can further damage the material. Since larvae acquire some nutrients from soiled areas of the materials, such as within folds and creases. Materials that are left undisturbed for long periods of time are usually attacked by the larvae.

References:

- Cox, P., & Pinniger, D. (2007). Biology, behaviour and environmentally sustainable control of *Tineola bisselliella* (Hummel) (Lepidoptera: Tineidae). *Journal of Stored Products Research*, 43(1), 2-32. doi:10.1016/j.jspr.2005.08.004
- Plarre, R., & Krüger-Carstensen, B. (2011). An attempt to reconstruct the natural and cultural history of the webbing clothes moth *Tineola bisselliella* Hummel (Lepidoptera: Tineidae). *Journal of Entomological and Acarological Research*, 43(2), 83. doi:10.4081/jear.2011.83

Pest Profile



Photo credit: Judy Gallagher, Flickr

Common Name: Western Conifer Seed Bug

Scientific Name: *Leptoglossus occidentalis*

Order and Family: Hemiptera: Coreidae

Size and Appearance:

	Length (mm)	Appearance
Egg	2 mm	
Larva/Nymph		<ul style="list-style-type: none">● Orange and brown for the early nymphs.● Reddish - brown for the older nymphs.
Adult	9 - 18 mm	<ul style="list-style-type: none">● Reddish - brown color.● Four segmented antennae.● Abdomen yellow to orange with five transverse black patches.● Tibia dilated.

Type of feeder (Chewing, sucking, etc.): Piercing-sucking

Host/s: Western conifer seed bugs feed on approximately 40 species, including white pine, red pine, Scots pine, Austrian pine, mugo pine, lodgepole pine, white spruce, Douglas-fir, and pistachio.

Description of Damage (larvae and adults): This insect damages seeds by piercing the cones with their piercing-sucking mouthparts, and sucks out the endosperm. This often results in the abortion or infertility of the seeds' endosperm, with up to 50 percent seed loss. Empty seeds appear indistinguishable from healthy seeds at time of harvest.

References:

- Bates, S. L., Lait, C. G., Borden, J. H., & Kermode, A. R. (2001). Effect of feeding by the western conifer seed bug, *Leptoglossus occidentalis*, on the major storage reserves of developing seeds and on seedling vigor of Douglas-fir. *Tree Physiology*, 21(7), 481-487.
- Bernardinelli, I., & Zandigiacomo, P. (2001). *Leptoglossus occidentalis* Heidemann (Heteroptera, Coreidae): a conifer seed bug recently found in northern Italy. *Journal of Forest Science*, 47(2), 56-58.
- Jacobs, S., Sr. (2002, February). Western Conifer Seed Bug (Department of Entomology). Retrieved from <https://ento.psu.edu/extension/factsheets/western-conifer-seedbug>
- Mjø, A. T., Nielsen, T. R., & Ødegaard, F. R. O. D. E. (2010). The western conifer seed bug (*Leptoglossus occidentalis* Heidemann, 1910)(Hemiptera, Coreidae) found in SW Norway. *Norwegian Journal of Entomology*, 57(1), 20-22.

Pest Profile



Photo credit: Andy Reago & Chrissy McClarren, Flickr

Common Name: Wheel Bug

Scientific Name: *Arilus cristatus*

Order and Family: Hemiptera: Reduviidae

Size and Appearance:

	Length (mm)	Appearance
Egg	3.7 mm	<ul style="list-style-type: none">• Brown and cylindrical, resembling bottles.
Larva/Nymph		<ul style="list-style-type: none">• Instars 1 - 4 with red, yellow and black markings.• Fifth instar gray-brown, similar to adult.
Adult	28 - 38 mm	<ul style="list-style-type: none">• Pronotum with semicircular crest with 8 - 12 tubercles.• Gray-brown body.• Reddish-brown 4 segmented antennae.• Three segmented, curved beak.

Type of feeder (Chewing, sucking, etc.): Piercing-sucking mouthparts.

Host/s: The nymphs and adults feed on various arthropods, including wasps, bees, and beetles. It is also a predator of many important pests including the fall webworm (*Hyphantria cunea*), imported cabbageworm (*Pieris rapae*), Mexican bean beetle (*Epilachna varivestis*), orangedog (*Papilio cresphontes*), tent caterpillar (*Malacosoma*), bollworm (*Helicoverpa zea*), and the brown marmorated stink bug (*Halyomorpha halys*).

Description of Damage (larvae and adults): Wheel bugs do not typically cause damage, but are capable of inflicting a painful bite if mishandled. The resulting wound can become inflamed and swell, with numbness lasting several days and pain lasting up to 10 days if untreated.

References:

- Hagerty, A. M., & McPherson, J. E. (2000). Life history and laboratory rearing of *Arilus cristatus* (Heteroptera: Reduviidae) in southern Illinois. *Florida Entomologist*, 83(1), 58
- Mead, F. W. (1999, June). Wheel Bug. Retrieved from https://entnemdept.ifas.ufl.edu/creatures/trees/wheel_bug.htm
- Smith, E. H., & Whitman, R. C. (1992). *NPCA field guide to structural pests*. Dunn Loring, VA: NPCA.

Pest Profile



Photo credit: James Gathany, Flickr

Common Name: Yellow Fever Mosquito

Scientific Name: *Aedes aegypti*

Order and Family: Diptera: Culicidae

Size and Appearance:

	Length (mm)	Appearance
Egg	1 mm	<ul style="list-style-type: none">● Small and oblong.● Shiny black
Larva/Nymph	1 - 1.5 mm (1st instar) 1.5 - 3 mm (2nd instar) 3 - 5 mm (3rd instar) 3.5 - 8 mm (4th instar)	<ul style="list-style-type: none">● Long with enlarged thorax.● Siphons on 8th abdominal segment.
Adult	4 - 7 mm 3.5 mm (wing length)	<ul style="list-style-type: none">● Dark brown to black body. Silver markings.● White rings on tarsal segments and dorsally on each abdominal segment.● Pair of halteres.● Males with plumose antennae● Antennae 15 segmented.
Pupa (if applicable)	4 - 5 mm	<ul style="list-style-type: none">● Thoracic respiratory trumpets.

Type of feeder (Chewing, sucking, etc.): Piercing-sucking

Host/s: Larvae feed on suspended microorganisms and detritus. Females are obligate blood feeders and feed on humans and other mammals. Blood meals are required for the development of eggs. Males are non-biting and receive nourishment from nectar.

Description of Damage (larvae and adults): Females are known to transmit dengue and yellow fever virus through blood feeding activity.

References:

Estimated range of *Aedes aegypti* and *Aedes albopictus* in the US. (n.d.). Retrieved from <https://www.cdc.gov/zika/vector/range.html>

Kauffman, E., Payne, A., Franke, M. A., Schmid, M. A., Harris, E., & Kramer, L. D. (2017). Rearing of *Culex* spp. and *Aedes* spp. Mosquitoes. *Bio-protocol*, 7(17), e2542. doi:10.21769/BioProtoc.2542

Smith, E. H., & Whitman, R. C. (1992). *NPCA field guide to structural pests*. Dunn Loring, VA: NPCA.

Zettel, C., & Kaufman, P. (2008, May). Yellow fever mosquito. Retrieved from http://entnemdept.ufl.edu/creatures/aquatic/aedes_aegypti.htm