



Dermestids

Erin W. Hodgson
Extension Entomology Specialist

Katherine Coats

Alan H. Roe
Insect Diagnostician

What You Should Know

- Dermestid beetle larvae are considered scavengers that feed on dead tissue; however, they will feed on wool and dry food supplies such as flour and pasta.
- Regular cleaning and inspection of food and fabrics will reduce potential dermestid damage.

Dermestid beetles are in the family Dermestidae and order Coleoptera. These beetles are sometimes called larder beetles or carpet beetles. Adults range from 1 to 12 mm in length and have variable body coloration. In general, they are hairy, dark-colored, elongated, and have clubbed antennae. The larvae are light brown and can be up to 13 mm long. Many larvae have spines, called setae, on the back of the abdomen that are helpful with identification. Dermestid larvae and adults have chewing mouthparts.

Life Cycle: Dermestid beetles undergo complete metamorphosis (egg, larva, pupa, adult). The total development time from egg to adult is highly variable depending on the species and surrounding temperatures. Some species take as long as 2 years to develop while others take only 6 weeks. Some dermestids can produce several generations per year under ideal temperatures (77-86°F). Mated females will lay around 90 eggs in dark places, like in cracks or crevices near a potential food source. Eggs hatch in 1 to 3 weeks. Larvae continuously feed and go through, on average, 3 to 5 molts. Cast skins from the molting larvae often accumulate around the food source. Fully developed larvae seek out wooden materials to pupate and are often discovered during this time. After pupation, the adults will emerge and seek a mate.

Detection: To check for infestations, inspect fabrics or animal products for pinpoint holes (Fig. 1). Check dried foods packaging for holes or contamination with larvae, shed skins, and fecal material. Infested food and other products will often include "off" colors and odors. Another sign of an dermestid infestation is an accumulation of dead adults on window sills.



Fig. 1. Black carpet beetle damage.¹

Feeding Habits

Adult dermestids commonly eat pollen and feed on various flowers. The larvae are the damaging life stage. Some dermestids can be considered "pantry pests" because they tend to feed on stored dry food products that comes from vegetables (e.g., bran, flour, spices, nuts, grain, pasta, cereal, etc.). Other dermestids are considered scavengers because they feed on things that are dead or of animal origin (e.g., hide, fur, feathers, leather, wool, dead insects, etc.). Dermestids can be considered pests in insect museums because they can destroy preserved specimens (Fig. 7). They can also feed on upholstery and cause damage to furniture, but will generally not feed on synthetic fabrics.

Dermestids can be useful as scavengers. For instance, if a rodent died in a home, the larvae could eat the remains. The problem with this is after consuming the rodent, they will begin searching for a new food source and could subsequently become pests. Also because dermestids feed on decaying matter, they are purposely used by museum curators and taxidermists to clean tissue off animal skeletons to be displayed.

Common Dermestid Beetles

Black Carpet Beetle: *Attagenus* spp.

The black carpet beetle is the most destructive and widespread dermestid in the United States. They cause damage to household products containing keratin, which is a protein found in animal hair and feathers. Plant products such as grains, as well as synthetic fabrics not derived from animal matter, may also be infested. Adults are black with brown legs, somewhat shiny, oval and about 2.5 to 5 mm long (Fig. 2). The larvae are shiny brown and carrot-shaped with a long bushy tail of brown hairs, and up to 12 mm long (Fig. 2). The life cycle takes about 6 to 12 months. Females lay up to 90 eggs at a time near potential food. Larvae molt 5 to 11 times depending on food availability. Adult black carpet beetles can live for about 2 months.



Fig. 2. Black carpet beetle adult and larva.¹

Larder beetle: *Dermestes lardarius*

Adult larder beetles, sometimes called bacon beetles, are 8 to 10 mm long, dark brown and covered with fine yellow hair. The forewings, or elytra, are black and yellow with six black spots (Fig. 3). The larva is longer than the adult and thickly covered with short and long setae that are reddish-brown to black (Fig. 5). They have two distinctive spines on end of the abdomen that curve backward. The larvae typically feed on raw skins and hides, but will also feed on stored meats, cheeses, tobacco, dried fish, dried museum specimens, and pet food. The life cycle of larder beetles ranges from 40 to 50 days. Females lay about 135 eggs near a potential food source. The larvae will molt 5 to 6 times over 30 to 80 days before boring into a hard substrate to pupate.



Fig. 3. Larder beetle adult.²

Varied carpet beetle: *Anthrenus verbasci*

The varied carpet beetle is also a common dermestid in the United States. Adults range from 2 to 33 mm in length. They have an irregular color pattern of scales on the forewings, or elytra, that vary from white, brown, yellow, or even gray-yellow (Fig. 4). The larvae are hairy and are banded with brown, yellow and black (Fig. 6). Varied carpet beetle larvae attack household objects like carpets, wool, or furs, but they can also eat dead insects or spiders. The life cycle takes about 1 to 3 years to complete. Indoors, females can lay up to 40 eggs near carpet or furs. Females will lay their eggs in the nests of bees, wasps, and birds, if outdoors. Larvae will feed for 200 to 620 days before pupating. Adults can live about 6 weeks.



Fig. 4. Varied carpet beetle adult.³

Management

Infested food products: The only reliable control technique is to locate and remove all dermestid infestations. Insecticidal treatments will not provide long-term control. Also it is important to check other foods surrounding the infested food to make sure the beetles are not spreading. To prevent further infestations, store food in sealed plastic or glass containers. Regularly wipe out the pantry and vacuum the cracks and crevices to remove excess food dust. Permanently sealing cracks will discourage beetles from laying eggs or pupating. Infested food products may be treated with heat or cold to kill adults and larvae. To do this simply heat the food item for 30 to 60 minutes at 130-140°F or freeze the food item for 4 to 7 days. Although hot and cold treatments will kill the dermestids, you will still have to remove dead larvae, adults, and shed skins. Separating dermestids from good products is usually not a cost-effective process.

Infested furs, fabrics, and clothing: For infestations in animal products, locate the source of infestation and check all other clothing items or possible areas of infestation. Normal dry cleaning procedures will kill all stages of the insect. To properly store items that are susceptible to carpet beetles, first make sure they are pest-free and clean. Place them in an airtight container, using paper to make a layer every few inches. Resin strips, which contain dichlorvos, are generally effective in protecting susceptible objects in enclosed containers as a long-term control method. Thoroughly vacuum furniture to remove accumulations. Also check for other possible food sources and remove those. For example dead insects in lights fixtures and window sills, old wasp nests in attics, and dead birds or rodents.



Fig. 5. Larder beetle larva.⁴



Fig. 6. Varied carpet beetle larva.³



Fig. 7. Dermestid larvae infesting a museum specimen.⁵

¹ Images courtesy of Clemson University - USDA Cooperative Extension Slide Series (www.ipmimages.org).

² Image courtesy of Joseph Berger (www.ipmimages.org).

³ Images courtesy of Andre Karwath, Wikipedia (http://en.wikipedia.org/wiki/Anthrenus_verbasci).

⁴ Image courtesy of Laura Jesse, Iowa State University (<http://www.ipm.iastate.edu/ipm/iin/blarderb.html>).

⁵ Image courtesy of Michal Marias, Wikipedia (<http://en.wikipedia.org/wiki/Dermestidae>).

Precautionary Statement: All pesticides have benefits and risks, however following the label will maximize the benefits and reduce risks. Pay attention to the directions for use and follow precautionary statements. Pesticide labels are considered legal documents containing instructions and limitations. Inconsistent use of the product or disregarding the label is a violation of both federal and state laws. The pesticide applicator is legally responsible for proper use.

Utah State University is committed to providing an environment free from harassment and other forms of illegal discrimination based on race, color, religion, sex, national origin, age (40 and older), disability, and veteran's status. USU's policy also prohibits discrimination on the basis of sexual orientation in employment and academic related practices and decisions. USU employees and students cannot, because of race, color, religion, sex, national origin, age, disability, or veteran's status, refuse to hire; discharge; promote; demote; terminate; discriminate in compensation; or discriminate regarding terms, privileges, or conditions of employment, against any person otherwise qualified. Employees and students also cannot discriminate in the classroom, residence halls, or in on/off campus, USU-sponsored events and activities. This publication is issued in furtherance of Cooperative Extension work, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Noelle E. Cockett, Vice President for Extension and Agriculture, Utah State University.