

Carpet Beetles as Pests: Biology and Management

Jon Zawislak – Assistant Professor of Apiculture & Urban Entomology

Carpet beetle is the collective term for a complex of species in the insect family Dermestidae. Although small, these scavengers can be formidable pests in households, museums and warehouses, where they can cause significant damage to organic materials. They particularly feed on keratin, a protein found in animal hair, feathers, and skin. Adult carpet beetles are generally benign, often observed outdoors in Arkansas feeding on pollen and nectar. Their larvae, however, are notorious for damaging natural fibers comprising clothing, upholstery, drapes, taxidermy specimens and some stored foods. Effective control of carpet beetles involves a deep understanding of their biology, life cycle, feeding preferences, and persistence in varied environments.

At least 10 species of Dermestid beetles can be found in Arkansas, but the Black Carpet Beetle (*Attagenus unicolor*) and Varied Carpet Beetle (*Anthrenus verbasci*) are most commonly found in homes. These species are widely distributed across North America, Europe and other temperate regions. While their exact habits vary slightly, their common developmental and behavioral traits make them resilient household pests.



Varied carpet beetle, *Anthrenus verbasci* (adult) © Brevan Wagner (BB BY-NC)
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Black Carpet Beetle, *Attagenus unicolor* (adult) © Chris O'Donoghue (CC-BY)
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Varied carpet beetle, *Anthrenus verbasci* (larva) © Jerry Kosanovich (CC BY-NC)
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Black Carpet Beetle, *Attagenus unicolor* (larva) © Stephen Luk (CC BY-NC)
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Biology and Life Cycle

All carpet beetles undergo complete metamorphosis, through egg, larva, pupa, and adult stages. Their developmental time varies significantly based on environmental conditions such as temperature, humidity, and the availability of suitable food.

Female carpet beetles lay anywhere from 30 to 100 eggs in a lifetime. Eggs are laid on or near food sources for the larvae, often in dark, secluded areas such as under baseboards, in air ducts, inside furniture or in closets. Eggs are small (less than 1 mm), white to cream-colored, and difficult to detect without magnification. Eggs hatch in 6 to 21 days, depending on ambient temperature; optimal hatching occurs in warm, humid conditions.

Larvae are the most damaging stage of the carpet beetle's life cycle. Known as "woolly bears" because of their bristly or hairy appearance, carpet beetle larvae range from 2 to 5 mm in length. Depending on species, their bodies are dark or light brown or tan with alternating light and dark bands. They possess distinctive tufts of hair, some of which can cause skin irritation in humans. Larval stage can last from 2 months to more than a year, depending on food availability and temperature. They molt multiple times as they grow, and they tend to avoid light, burrowing deep into materials as they feed.

Once mature, larvae will pupate in concealed places. The pupal stage lasts 1 to 2 weeks, after which adult beetles emerge. Adults are oval-shaped, 2 to 4 mm long, and may have colorful, speckled patterns on their elytra (wing covers). They are active flyers and are often attracted to light sources.

Adult carpet beetles live for several weeks to a few months. Their main role is reproduction; however, they often feed on flower pollen and nectar, making them common visitors to windows near gardens and landscaping.

Feeding Habits and Damage

The disparity in diet between adult and larval carpet beetles significantly affects how they are controlled. Larvae feed primarily on animal-based organic matter such as wool, cashmere, silk, feathers, fur and hair (including shed pet hair). They will also feed on tanned leather and hides and occasionally on dried meats. They can damage upholstered furniture, drapes, carpets and clothing items that contain natural fibers. They will readily scavenge dead insects and rodent carcasses in crawlspaces and other inaccessible areas. They do not require a direct water source, and can survive their entire lives without drinking liquid water, obtaining all necessary moisture from their food sources.

Larvae are particularly damaging in museums, where they can destroy rare taxidermy collections, mounted insects, and historical garments. Unlike clothes moths, which often prefer soiled fabric, carpet beetle larvae may consume clean fibers, making them difficult to detect until damage has occurred. Signs of infestation include irregular holes in fabric, larval cast skins, and granular fecal pellets.

Adult carpet beetles feed on plant materials, particularly pollen and nectar from flowering plants, and (more rarely) grains or dried plant matter in pantries. Adults do not cause damage indoors, but may enter through windows or doors. Once inside, they may lay eggs near potential food sources listed above. They often gather around light fixtures or window sills, serving as a sign of potential larval infestation elsewhere in the home.

Pest Status and Economic Impact

Carpet beetles are considered serious indoor pests because of the destructive feeding behavior of their larvae. The economic impact of infestations includes damage to clothing, rugs, upholstery, and historical artifacts and taxidermy. Allergic reactions or skin irritations are possible in sensitive individuals due to larval hairs.

Unlike pests that reproduce rapidly in large numbers, carpet beetles are insidious—they can go unnoticed for months or years, during which time they steadily damage stored items. Their cryptic behavior and wide range of food sources make them especially challenging to eliminate. Infestations may be localized or widespread depending on how long the insects have been active.

Check for larvae and their cast skins under baseboards, and in and under upholstered furniture, clothes closets, air ducts, stuffed animal trophies, stored cereals and grain, abandoned bird and wasp nests under eaves and in attics. Stored items are vulnerable to severe damage, so periodically inspect woolens and other susceptible items.

Control and Management

Eliminating or preventing carpet beetle infestations requires a comprehensive approach of **integrated pest management (IPM)** that combines multiple strategies. This method is more effective and sustainable than relying on a single solution.

The first step in any successful management plan is thorough **inspection**. Carpet beetles thrive in dark, undisturbed areas, making a careful search essential. Homeowners should focus on closets, storage areas in attics and basements, and the spaces beneath furniture and baseboards. Also check items made of natural fibers, such as wool clothing, pet bedding, and stored linens. Sticky traps can help monitor for adult beetles, providing an early warning of infestation.



Carpet beetle damage to fabric.
Photo courtesy nachi.org

Sanitation and **prevention** are the core of management strategy. Regular and diligent cleaning is imperative. Frequent vacuuming of floors, upholstered furniture, rugs and carpets, helps to remove eggs, larvae, and food sources. For particularly vulnerable items, such as woolens, washing or dry-cleaning them before storage in airtight containers is a key preventative measure. Additionally, removing pet hair and lint from baseboards and other crevices can eliminate common food sources for beetle larvae.

To prevent future problems, **exclusion** is critical. Seal cracks and gaps around windows, doors, and baseboards to deny beetles easy access into a home. Maintain screens on windows and vents to further limit their entry. Regularly inspect taxidermy trophies and other items that may be affected by beetles.

When an infestation is extensive, **chemical controls** may be necessary. Homeowners can use residual insecticide sprays containing pyrethroids in cracks and crevices where beetles are likely to hide. For hard-to-reach spaces, such as wall voids, insecticidal dusts can be applied. It is important to avoid broad application on clothing or furniture; instead, a focused spot treatment is both safer and more effective. For large or inaccessible infestations, consulting a professional pest control service is the safest course of action.

In addition to chemical options, there are several **natural and non-chemical methods** that can be very effective. Freezing or heating infested items can be a reliable way to kill all life stages of the beetles, provided it is safe for the infested items. Applying diatomaceous earth under baseboards and in wall voids can also deter and kill crawling larvae. While some natural repellents like cedar wood and lavender are often recommended, their scientific effectiveness is not well-established.

Page 316 of the current **MP-144** publication from the University of Arkansas System Division of Agriculture lists recommended chemical treatments for carpet beetles:

<https://www.uaex.uada.edu/publications/mp-144.aspx>

Be sure to read and follow all label instructions when using any pesticide product:

Ultimately, a multi-faceted approach combining inspection, sanitation, exclusion, and carefully chosen controls is the most effective way to manage and prevent carpet beetle infestations. Awareness and early intervention are the best tools in preventing costly damage from these pests. By understanding their biology, identifying signs of infestation, and responding promptly, homeowners can protect their fabrics, collections, and peace of mind from these uninvited guests.