

# Cockroaches

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There are four kinds of cockroaches that can infest homes in Minnesota, including German cockroach, brownbanded cockroach, American cockroach, and Oriental cockroach. These four species can be major pests in restaurants, hospitals, warehouses, offices and buildings with food-handling areas. A fifth kind, the Pennsylvania wood cockroach, may enter buildings accidentally but become only a temporary nuisance.

## Importance

Many people are repulsed and/or disgusted by the simple presence of cockroaches. However, they are also an important public health problem by contaminating food and eating utensils. Cockroaches are known to carry human pathogens, such as Salmonella and E. coli, which can result in human diseases, such as food poisoning or diarrhea. Occasionally, they will destroy fabric and paper products. In large numbers, cockroaches secrete a substance which can result in stains on surfaces they contact and produce disagreeable odors. Finally, products of cockroach infestations, including saliva, feces and cast skins, are a source of allergens and can irritate allergies and asthma in people, especially children.

## Identification

Correct identification of suspected cockroaches is important as there are many in (e.g. long-horned beetles, crickets, leaf-footed bugs and ground beetles). A cockroach has a flattened, oval shaped body and long antennae (about the length of their body). When looking at a cockroach from above, its head is hidden from view. It has six strong legs covered with spines (figs.1, 2, 3, 4, 5, 6).

Many adult cockroaches have fully developed wings, although few fly. Other cockroaches have short wings or lack wings altogether. Young, immature cockroaches resemble adults but are smaller and wingless. If there is any doubt about whether an insect is a cockroach, submit a sample to an insect specialist or a pest management expert.

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## Biology

A cockroach has three stages during its life cycle: egg, nymph, and adult. Adults lay eggs contained within egg cases that are dark-colored and roughly the same size and shape as a dry kidney bean (fig. 7). Depending on the species, an egg case contains between 16 - 50 eggs. Eggs hatch into young cockroaches called nymphs. In a normal cockroach population, nymphs are more numerous than adults.

Cockroaches are nocturnal, hiding during the day and becoming active at night. The number of cockroaches people see is usually a small percentage of a much larger population. Cockroaches prefer different habitats depending on the species. German cockroaches prefer dark, warm, humid areas near sources of food and water. American and Oriental cockroaches prefer cooler areas, such as basements and crawl spaces. Brownbanded cockroaches prefer drier areas, such as pantries and closets. All cockroaches are scavengers and will survive on almost any food as well as backing glue, leather, bookbindings, bar soap. They may even sample electronics and wiring in television and microwave (though infestation have to be large when this type of damage occurs). They spend most of their time in narrow, tight cracks and spaces where surfaces touch them on both sides. Cockroaches tend to congregate in corners and generally travel along the edges of walls or other surfaces.

## Types of Cockroaches

The **German cockroach** is the most common indoor cockroach species in Minnesota. It favors warm, humid atmospheres, especially areas where temperatures are around 70° to 75° F. It generally inhabits kitchens and bathrooms where they are found near plumbing fixtures, in cracks or crevices in cupboards, under drawers and kitchen sinks, and similar locations. These cockroaches often cluster together in favorable hiding areas. When severe infestations occur, they may be found in other sections of buildings. German cockroaches can disperse in large numbers from areas of high population densities to infest other locations.



*Figure 1. German Cockroach  
(University of Nebraska, Department  
of Entomology)*

The adult (fig. 1) is about ½ inch long, light brown or tan, and has two dark longitudinal bands or streaks on the prothorax behind the head. This species has the highest reproductive potential of all the common pest cockroaches. Females produce about 30 to 50 eggs at a time. The female carries the egg case until the eggs are ready to hatch.

The immature nymph (fig. 1) is smaller, dark-colored with a light-colored streak running down its back. An immature nymph reaches maturity in about 40 to 125 days. Adult females live about 200 days, producing six to eight egg cases throughout their life.



*Figure 2. Brownbanded Cockroach  
(University of Nebraska, Department  
of Entomology)*

The **brownbanded cockroach** may also be common in Minnesota homes. Individuals can be widely distributed throughout a building, particularly in high areas, hiding behind pictures and clocks, beneath furniture, among books and in other drier areas not normally

infested by German cockroaches. They seek areas that are warm most of the time including appliances such as radios, televisions and refrigerators. The brownbanded cockroach prefers warmer temperatures (greater than 80° F) than the German cockroach. The two species are rarely found together.

The adult brownbanded cockroach is about ½ inch long. An adult male is golden brown and has a narrow body with its wings extending beyond the tip of its abdomen (fig. 2). A female adult is dark chestnut brown, has a teardrop-shaped body, and its wings do not completely cover the abdomen (fig. 2). Both sexes have distinctive horizontal yellow bands. The female often glues its egg case on furniture or in appliances. Eggs take about 70 days to hatch and about 160 days for the young to reach maturity. A nymph is recognized from the two pale bands which run horizontally across its body.

The **Oriental cockroach** prefers dark, damp places. Often called a water bug, it is commonly found in damp basements, cellars, crawl spaces, and sewers. It may also be found near drains, leaky water pipes and under refrigerators, sinks, washing machines, and floors. It prefers temperatures under 84° F. The Oriental cockroach can tolerate cool environments and people have even found it surviving freezing outdoor weather. An Oriental cockroach forages mostly on the first floors of buildings. Occasionally, this pest will thrive in the landscape immediately adjacent to structures and may enter if a disturbance occurs, such as a change in the seasons, excess rainfall, or lawn mowing. It can be found occasionally outdoors under sewer covers. It feeds on all types of garbage and other organic material. An Oriental cockroach produces a strong smell and is considered one of the dirtiest of all the cockroaches.



*Figure 3. Oriental Cockroach (University of Nebraska, Department of Entomology)*

An adult Oriental cockroach is about 1 to 1-1/4 inches long and dark brown, almost black. A male has fully developed wings which are shorter than the body. A female has very short, rudimentary wings (fig. 3). A nymph is similar in appearance to a female only it is smaller and wingless. A female deposits an average of eight egg cases during its lifetime; each capsule produces about 16 young. It takes 300 to 800 days, depending on conditions, for Oriental cockroaches to hatch from eggs and develop into adults.

The **American cockroach** is occasionally found in homes, although it is more common in restaurants, grocery stores, and bakeries and other sites where food is prepared. It favors very warm, moist places (temperatures in excess of 82° F). An American cockroach has a fondness for fermenting foods, e.g. bread soaked with beer. Their foraging is confined mostly to the basement and ground floor of a building unless suitable conditions exist in higher locations. Sewers and drain lines may help this pest invade new areas.



*Figure 4. American Cockroach (University of Nebraska, Department of Entomology)*

This is the largest cockroach species to infest buildings in Minnesota. Both the adult male and female is about 1-1/2 to 2 inches long, reddish brown and possesses long wings that cover its abdomen (fig. 4). A female typically produces 9 to 10 egg cases which are deposited carefully in a crack or crevice. Eggs hatch in about 45 days with each case producing about 14

young. An immature nymph is reddish brown and wingless. A young nymph matures in as little as 215 days to as long as 400 days. The average life span for adult females is about 440 days.

The **Pennsylvania wood cockroach** lives in wooded areas in rotting logs and under loose bark. It can accidentally invade homes, cabins, cottages, and other buildings in or near wooded areas. This cockroach is not a persistent household pest and it doesn't reproduce indoors. Because of its association with wood, a Pennsylvania wood cockroach can be brought indoors on firewood. It may enter buildings if suitable harborage (trees and logs) is close to open doors and windows. The males are strong fliers.

The adult male is one inch long, dark brown, with light-colored bands on the edge of the body near the head (fig. 5). Males also have long, well-developed wings. The adult female is similar, but with very short wings (fig. 5), measuring about 1/2 inch long. Adult females and immature nymphs can be confused with the Oriental cockroach. However, the Oriental cockroach lacks the light bands on the edge of its body near the head. If there is any doubt, submit a sample to an insect specialist or a pest management expert for identification.



*Figure 5. Pennsylvania Wood Cockroach (University of Nebraska, Department of Entomology)*

Manage Pennsylvania wood cockroaches by reducing their breeding places. Remove decayed and fallen logs within a few hundred feet of a building. Physically remove an occasional Pennsylvania wood cockroach that you find indoors. If larger numbers are entering the home, you may wish to treat the exterior of the building, particularly around doors and windows, with a residual insecticide. Common products include permethrin, bifenthrin, or cyfluthrin.

**Australian cockroaches** (fig. 6), **Surinam cockroaches**, and **Madeira cockroaches** are examples of subtropical cockroaches that are rarely seen in Minnesota. When they are found, it is because they have been accidentally transported into the state. These insects are not accustomed to Minnesota conditions—it is too cool and dry for them to establish themselves indoors. However, these cockroaches can survive if they are accidentally introduced into a greenhouse or other location where there is sufficient warmth and humidity. Australian cockroaches will infest similar areas that the American cockroach will inhabit. The Surinam and Madeira cockroaches can sometimes be found in potted plants associated with contracted indoor landscaping and indoor arboretums. If there is any question whether you have encountered such a cockroach, submit a sample for identification to an insect specialist or a pest management expert.



*Figure 6. Australian Cockroach (University of Florida Entomology and Nematology Dept)*

## Management

### Preventive measures

Cockroaches can be carried into homes in bags, boxes, and luggage. Corrugated cardboard boxes are a particularly good source of infestations. Examine containers that are brought into your home

carefully for the presence of cockroaches or their egg capsules, especially if they are brought in from locations known to be infested with cockroaches.

If you suspect cockroaches may have been brought into your home, set out sticky traps to monitor their presence. Place sticky traps so they are tight against edges, e.g. where walls meet floors (fig. 8). Place them in areas where cockroaches are likely to occur, e.g. in cupboards and around refrigerators, stoves, and sinks.



Figure 7. Cockroach Egg Capsules (University of Nebraska, Department of Entomology)

### Sanitation

Sanitation is very important to reduce cockroach infestations. Cockroaches need water and food to live. By limiting their access to these resources, you reduce their ability to survive and reproduce. It is difficult to make your home and other buildings completely unacceptable for cockroaches, but you can minimize an existing infestation when improving sanitation.

- Do not leave food out over night; keep all food stored in a refrigerator or in insect-proof containers made of plastic, metal, or glass with tight-fitting covers.
- Do not leave pet food and water out overnight.
- Wash your dishes, pans, and utensils as soon as you are done using them.
- Remove all food or spilled drinks from counter tops and clean counters, sinks, and tables with soapy water.
- Vacuum all cracks and crevices to remove debris and food. Also sweep or vacuum any food and debris on floors.
- Take garbage out daily in closed plastic containers; keep waste containers washed and clean.
- Repair any leaky water pipes or faucets.
- Recycle cans and bottles on a regular basis; wash and clean containers that hold recycling items.
- Increase ventilation where condensation is a problem.

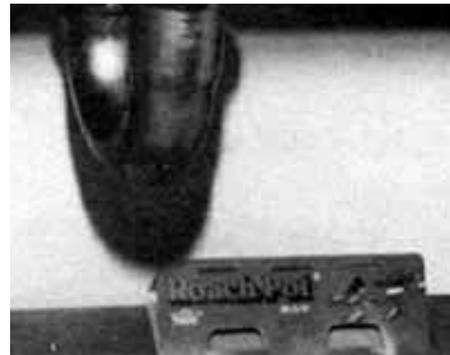


Figure 8. Sticky roach trap under kitchen sink

### Harborage Reduction

Cockroaches also need favorable places to live to successfully live and reproduce. You can reduce cockroach numbers when you eliminate favorable sites.

Remove boxes, especially if they're made from corrugated cardboard, newspapers, bags, and other unnecessary items that can clutter rooms. When storing items, leave space between the packages.

Use caulk to seal spaces and cracks where cockroaches hide. When an infestation exists in a home, concentrate on areas where cockroach numbers are the highest.

Seal spaces, e.g. with steel wool, in apartments and other multi-unit dwellings where plumbing or electrical wiring goes through walls. Placing escutcheon plates at points where plumbing enters the wall will help prevent cockroaches moving to other areas in multi-unit dwellings.

## **Non-chemical management**

**Physical Removal.** Vacuuming can remove a significant number of cockroaches and egg cases from the environment and can be quite effective when combined with other methods. When possible, use vacuums with a high efficiency particulate air (HEPA) filter to reduce cockroach debris that may become airborne.

Sticky traps help capture cockroaches but generally do not capture enough insects to be practical to help reduce a cockroach problem. However, they are a useful management tool to monitor for the presence of cockroaches.

**Cold Treatment.** You can cold treat small items, such as toasters, clocks, or boxes, to kill cockroaches that may be infesting them. Put the item in a plastic bag, close it up, and put the bag in a freezer. In winter, you could set the bag outside when temperatures are at or near 0 degrees F. Leave the bag in the cold for 5 days. After that, clean the item well before bringing it back into your home.

## **Insecticidal control**

If you have a cockroach problem, it is often necessary to apply an insecticide in addition to nonchemical measures to eliminate an infestation. Insecticides, however, are much more effective when their use is combined with sanitation, harborage reduction, and other nonchemical efforts.

It is often very challenging to treat cockroaches. In most cases, it is best to hire an experienced pest management service (pest control company) to treat them. They have the necessary experience and tools to successfully eliminate these pests from your home. However, your cooperation with a technician in improving sanitation and reducing harborage areas is very important in the management of cockroaches.

If you attempt to treat a cockroach problem yourself, it is first important to determine where they are most common. You can do this by setting out sticky traps (purchased under such names as Roach Motel or Roach Trap). Distribute the traps in a variety of locations, especially in areas where cockroaches have been sighted. Be sure traps are placed tightly against walls or objects so cockroaches can not go around them. Remember that cockroaches prefer warm, moist areas near water sources. Record the number of cockroaches trapped and apply insecticides near the traps with the largest catches.

There are several options for insecticide treatment of cockroaches, baits, dusts (powders), and sprays (liquid or aerosol).

Cockroach baits are typically available in ready-to-use plastic child-proof containers. Common active ingredients include abamectin, fipronil, or hydramethylnon. Place them in areas where you find cockroaches following label directions. An advantage of baits is that they can be placed in very precise locations which avoids general broadcast applications. However, baits act somewhat slowly and results may not be easy to see when they are first used.

You can supplement baits with applications of boric acid, a type of inorganic dust. Common trade names include Roach Powder and Roach Prufe. Place boric acid in isolated places, such as behind and under refrigerators, stoves, and sinks. Do not apply boric acid where children and pets can reach it.

There are many insecticide sprays available in ready-to-use aerosol or liquid products. Some common active ingredients include permethrin, deltamethrin, cyfluthrin, and cypermethrin. Spray in precise, specific

sites in cracks and crevices behind sinks, cabinets, around drains and plumbing, and other sites allowed by the label. It is not necessary to treat flat surfaces such as countertops, floor surfaces, etc. Avoid contaminating food, dishes, or utensils.

**Caution: Read all label directions carefully before buying insecticides and again before you apply them. Always follow all label directions completely. The label is the final authority for use of the product.**

Do not use aerosol foggers and bombs. These products do a poor job of delivering insecticides to the cracks and crevices where cockroaches hide while increasing the exposure of pesticides to people and pets.

Cockroaches are particularly challenging to control in multi-unit dwellings, such as apartment buildings. It is usually necessary to treat the units that are known to be infesting as well as all adjacent units. Cockroach control in multiple unit buildings usually requires the services of an experienced pest management service.

## Moving

Take preventive measures to minimize moving cockroaches with you. When possible, use boxes and packing material from a place un-infested with cockroaches. When packing, watch for cockroaches and their egg capsules (fig. 7), removing and destroying any you find. The capsules are dark-colored and about the size and shape of a dry kidney bean. Ideally, it is best to take all boxes out of the home by night time and store in place that is un-infested with cockroaches.

If boxes must be stored overnight in infested buildings, keep them off the floor and away from walls by placing them on chairs or tables. During the winter, you can store boxes in unheated locations, such as garages.

Once you have arrived at your new home, again watch carefully for egg capsules and cockroaches that may have survived the trip. If you are not sure whether you brought any cockroaches with you, set out sticky traps to determine if they are present. It is much easier to deal with a small population of cockroaches right away than to allow them to become abundant and then try to treat them.