



Cockroaches Found in Living Spaces

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Introduction

Several species of cockroaches are found in close association with human housing. These include the American (Fig. 1), the oriental, the German (Fig. 2), the brownbanded (Fig. 3), and the smokybrown cockroaches. These species have adapted to the warmer conditions, accessibility of water and food sources, and abundant hiding places in our homes and buildings. Cockroaches belong to the order Blattodea.



Figure 1. An adult American cockroach (Gary Alpert, Harvard University, Bugwood.org).

Identification

Most cockroaches are flattened insects with an elongated oval shape, usually with long, spiny legs and long antennae (Figs. 1-3). Species found in Virginia typically range in color from reddish-brown to yellowish-brown, with some being almost black. The American cockroach (*Periplaneta americana*) has a light colored pronotum behind the head with two darker reddish spots (Fig. 1). The adult German cockroach (*Blattella germanica*) has two parallel dark bands on the pronotum (Fig. 2). Some species have fully developed wings as adults while other species lack wings or only have short wings. Not all species fly readily, even if they have wings. Species

found in Virginia range in size from the smaller German cockroach (10-15 mm or 0.4-0.6 inch) to the large American cockroach measuring (2.5-3.8 cm or 1-1.5 inch).



Figure 2. An adult German cockroach (Pest and Diseases Image Library, Bugwood.org).



Figure 3. Adult (top row), nymphal (middle row), and egg (bottom row) stages of the brownbanded cockroach (Daniel R. Suiter, University of Georgia, Bugwood.org).

Cockroach eggs are deposited in a leathery, protective capsule called an “ootheca” (Fig. 4). The

appearance of the ootheca varies by the species of cockroach (Figs. 3 and 4).



Figure 4. American cockroach egg case or ootheca (Gary Alpert, Harvard University, Bugwood.org).

Damage

Cockroaches are generally omnivorous scavengers, eating a wide range of foodstuffs including plant matter, dead insects, animal feeds, human foods, garbage, and materials soiled with starches or oils. Cockroaches readily feed on animal feed or food for human consumption, contaminating them with their feces, body parts, and sometimes the germs they carry on their bodies. Some cockroaches produce a characteristically strong, unpleasant odor that may transfer to belongings and the interior of buildings. Cockroach feces and secretions, which look like dark spots and smears, will stain and ruin furnishings. In general, the presence of cockroaches is objectionable and not tolerated by most people.

Medical Importance

Cockroach secretions, feces, and body parts can trigger allergies and asthma in some people. See your healthcare provider for help with allergic and respiratory symptoms associated with cockroaches. Cockroaches can also transfer germs on their bodies; proper sanitation is key to preventing foodborne illness carried by cockroaches. Continue cleaning houses thoroughly even after cockroach infestations have been eliminated as their allergens will persist even after the cockroaches are gone.

Life Cycle

All species of cockroaches have an incomplete life cycle consisting of the egg, nymphal, and adult stages (Fig. 3). All three stages can be found together, and multiple, overlapping generations of

cockroaches can occur indoors with sufficient warmth, food, and water.

Monitoring and Detection

A general awareness of the cockroach life cycle and their habits will help homeowners recognize cockroaches and know where to look for them in the home. Cockroaches are primarily nocturnal; homeowners may find dead cockroaches, egg cases, cast skins, or cockroach droppings before seeing a live cockroach. Increasing numbers of cockroaches seen during the day may indicate a large, growing cockroach infestation. Cockroaches habitually use “runways” where there is a high level of cockroach traffic. Examples of runways include a water pipe that goes through a wall, the narrow area beside or behind a kitchen appliance, or along cabinet bases near the floor. Harborage are sheltered places where cockroaches congregate near food and water sources. In addition, pheromones in cockroach droppings attract more cockroaches to runways and harborage. Some species of cockroaches prefer hiding inside electronics and small appliances.

Sticky card or adhesive traps can be very useful for detecting and monitoring the presence of cockroaches (Fig. 5). They are available with and without bait lures. Use sticky card traps near suspected runways and harborage. Sticky traps alone are unlikely to control a cockroach population.



Figure 5. A sticky trap with German cockroaches (Gary Alpert, Harvard University, Bugwood.org).

Control Methods

Cockroaches can be controlled using non-chemical and chemical methods, but using a combination of these methods is the best strategy to eliminate and prevent cockroaches in the house. Insecticides can be used to treat cockroaches inside the home, but

sanitation and exclusion methods will help prevent them from coming inside and establishing indoors. Consider using a professional pest control company for extensive cockroach problems. Pest control operators may have specialized equipment or professional use materials not available to non-licensed homeowners. Managing cockroaches in multifamily residential housing requires a community effort as pests in untreated units can spread to previously treated units.

Non-chemical Methods

Non-chemical control methods focus on excluding pests from the house and the restriction or elimination of the food, water, and shelter cockroaches need for survival. These methods help prevent cockroaches from invading a house and make the house less inhabitable for them.

Limit access points where cockroaches and other pests enter a building from the outside. Seal all cracks and crevices in foundations with caulk or expandable foam, including holes where wires and pipes may penetrate the foundation or walls. Tightly packed steel wool may also be used. Screen vents with fine mesh to allow air flow. Ensure that windows and doors have tight-fitting screens with door sweeps and weather stripping in good condition. Infrequently used faucets and flush toilets should be periodically run or flushed to refresh drain traps as cockroaches can enter through dry drains.

Do not leave food out on counters; put away leftovers and wash dirty dishes promptly. Dry foods and stored products can be kept in containers with good seals. Clean up food spills and accumulated cooking grease around stoves and other appliances. Do not leave pet food and water out overnight. Cockroaches must have a source of water for survival, so correct any water leaks or condensation problems at sinks, toilets, water heaters, air conditioners, water pipes, faucets, etc.

Remove vines that run up buildings, trim branches that extend over roofs, and keep foundation plantings neat and away from the foundation. Keep roofing and gutters in good repair and free of fallen leaves. Thick layers of wood mulch around foundations encourage cockroach populations, which may migrate indoors in colder weather. Don't stack firewood beside the house, and only bring in small amounts of firewood to be burned immediately.

Monitor cockroach populations using sticky boards or traps, which will indicate where and when cockroaches are active. Once cockroaches are detected, conduct a deep cleaning of the area and consider using insecticides for control.

Indoors, vacuum regularly to remove crumbs and food that support cockroach populations, and to remove cockroaches and their debris. Seal cracks and crevices along baseboards, between cabinets and walls, around outlets, and similar places to discourage cockroaches from sheltering there. Use hot, soapy water to remove cockroach droppings and their aggregation pheromones. Remove useless clutter and junk from the house, garage, and other places around the home. Unused cardboard boxes, stacks of papers, and piles of laundry provide ideal shelter and hiding places for cockroaches and other pests. Bag garbage and take it out frequently. Do not let spilled garbage accumulate in trash or garbage cans, which should have tight fitting lids. Materials stored for recycling should be cleaned and kept outdoors until taken to a recycling center.

Check groceries, laundry, furniture, and packages for signs of cockroaches before bringing indoors. Secondhand furniture or items kept in storage should always be inspected as well. Do not bring anything with signs of cockroaches inside the house.

Insect Growth Regulators (IGRs)

IGRs are compounds that mimic insect hormones and interfere with the proper development of immature insects or the formation of the insect exoskeleton. IGRs do not kill cockroaches immediately, but the population declines over months because the insects are unable to reproduce. IGRs are available as aerosol or liquid sprays, gel baits, and specialized vapor release devices. IGRs work well in conjunction with inorganic dusts and insecticidal baits along with nonchemical methods.

Aerosol and Liquid Sprays

Aerosol insecticide sprays in pressurized metal cans can be used when individual cockroaches are seen. Aerosol insecticides intended for use by a home owner typically have quick knockdown of the cockroaches directly contacted by the spray, but usually lack residual activity and are not intended for controlling large populations of cockroaches. Liquid sprays labeled for cockroach control in residences

are available as spot or crack-and-crevice treatments. These materials have a pump sprayer or a wand device and generally have a longer residual activity than aerosol insecticides. With either aerosol or liquid sprays, use products labeled for indoor use if spraying indoors, follow all label recommendations, and do not contaminate food or water.

Baits

Cockroach baits are formulated as an attractant with an insecticide and/or an IGR. They are available as dusts, gel or pastes, and granular formulations.

Baits are available in preloaded bait stations or strips. Small bait stations intended for German cockroaches may not allow access to larger species such as the American cockroach. Discard the stations when empty, or they may become harborage.

Both gel and paste baits are available in syringes for application of small amounts of the bait in runways, harborage, cracks and crevices, and other places where cockroaches are found. Granular baits are primarily intended for outdoor applications around house perimeters to manage cockroach species that sometimes invade houses, but are sometimes used in non-living areas such as basements or indoor storage areas.

Indoor baits tend to be most effective after the house has been thoroughly cleaned and all food and water sources have been removed. Baits should be used continuously until cockroach populations decrease. Replace baits when they dry out. Do not use aerosol or liquid insecticides around baits as they may repel cockroaches from the bait.

Inorganic Dusts/Powders

Boric acid, silica gel, or diatomaceous earth dusts and powders work as desiccants or stomach poisons for cockroaches. They should be applied as a thin, barely visible layer of dust in cracks and crevices, behind cabinets, or other suitable places using a bulb duster or puffing applicator. These materials are effective in clean, dry areas, but must be reapplied if they get damp or wet. Boric acid may also be available as a gel formulation. These products are slower acting than other insecticides and do not prevent cockroaches from reproducing before dying.

Wood Roaches

Other species of cockroaches collectively known as the wood roaches (*Parcoblatta* spp.) live outdoors and are only occasionally found indoors. They can be common in wood piles, rain gutters, and trees near houses. The males sometimes fly to lights at night. Although wood roaches sometimes come inside houses, they are unable to establish and reproduce in living spaces where conditions are too warm and dry. Their presence indoors may be objectionable, but they are not considered to be pest species like American or German cockroaches. For more information about wood roaches, see the fact sheet Wood Roaches ([VCE ENTO-426NP](#)).

Notes

Many research studies have shown that ultrasonic devices do not repel or kill cockroaches as claimed. Their use is not recommended.

Insecticide foggers and “bug bombs” for indoor insects do not always work as advertised. Insecticide foggers can only penetrate cracks and crevices to a certain extent and may not fully reach deep into cluttered areas where cockroaches hide. They are most effective if the house has been thoroughly cleaned, clutter has been removed, and entrance points have been closed before use, but seldom do they eliminate pest populations.

Many people prefer to use less-toxic alternatives rather than traditional pesticides for pest control in their houses. Borax, baking soda, and baking powder are often touted as effective remedies for cockroaches, but they do little to reduce cockroach populations. Homeowners may confuse these materials with boric acid, which is recommended for cockroach control.

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