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# Carpenter Ants

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Common Name	Scientific Name
Carpenter Ants	<i>Camponotus</i> spp.

Carpenter ants are so-named because these social insects excavate galleries in wood to create nest sites. They use their strong jaws (mandibles) to remove quantities of wood as they expand the size of their nests. Unlike termites, carpenter ants do not consume wood.

Carpenter ants belong to the genus *Camponotus*. Carpenter ants are among the largest ants occurring in the United States, and some species are about ½ inch long. However, size alone is not a good diagnostic tool, because workers of several sizes occur in a single colony. These polymorphic workers are sometimes called minor, intermediate, and major workers (from smallest to largest, respectively).

## Identification

Carpenter ants may be black, red, brown, tan, yellow, or some combination thereof, depending on the species.

In Ohio, the black carpenter ant, *Camponotus pennsylvanicus*, is the most common species (Figure 1). This ant is black, with very fine whitish or yellowish hairs on the abdomen. Minor workers of the black carpenter ant generally are about ¼ inch long and major workers are approximately ½ inch.

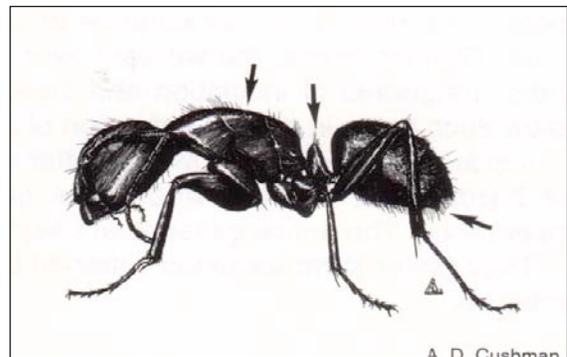
Like other ants, carpenter ants have a constricted waist and elbowed antennae.

Carpenter ants may be identified based on several characteristics, including an evenly rounded, arched thorax, when viewed from the side; one node between the thorax and abdomen; and a fringe of hairs around the anal opening at the tip of the abdomen (Figure 2).

The combination of the first two characteristics is useful to distinguish carpenter ants from other ant species commonly found in Ohio.



**Figure 1. A worker of the black carpenter ant.**  
 (Photograph courtesy of Dave Shetlar, The Ohio State University, Entomology)



**Figure 2. Arrows point to the distinguishing characteristics of a carpenter ant: an evenly rounded, arched thorax; one node between the thorax and abdomen; and a fringe of hairs at the tip of the abdomen.** (Illustration courtesy of the National Pest Management Association)

Carpenter ants DO NOT create mounds in the soil; such behavior is characteristic of *Formica*, a genus that also contains species of large black ants. *Formica* species (field ants) are common in Ohio. These ants have a single node, but the thorax has a distinct indentation. Be sure that you do not mistake *Formica* foragers for *Camponotus* foragers because management strategies for these types of ants are entirely different.

Workers have strong jaws and bite readily if they are handled. In addition to delivering a painful bite, they also can inject formic acid into the wound. They do not have a stinger.

Carpenter ant swarmer (alates or winged reproductives) have transparent wings with prominent veins; the paired forewings are much larger than the hind wings. Winged males are much smaller than winged females (Figure 3). Unlike termites, carpenter ant wings are not easily removed.

The following sections on life cycle, habits, etc. pertain to the black carpenter ant. They do not necessarily pertain to other species of carpenter ants.



**Figure 3. Male (left) and female (right) alates of the black carpenter ant.** (Photograph courtesy of Dave Shetlar, The Ohio State University, Entomology)

## Life Cycle

Winged male and female carpenter ants (swarmers) emerge from mature colonies usually from March to July. After mating, the males die and each newly fertilized female (sperm is stored in the spermatheca) establishes a new colony in a small cavity in wood, under bark, etc. The first brood of larvae is fed entirely by the queen. She does not take food, but metabolizes stored fat reserves and wing muscles for nourishment. The few workers emerging from the first brood assume duties of the colony, such as collecting food (the carpenter ant diet consists of a wide range of plant and animal materials), excavating galleries to enlarge the nest, and tending the eggs, larvae, and

pupae of the second generation. The workers regurgitate food to nourish the developing larvae and the queen. The queen has few duties except to lay eggs. All of the workers in the colony are sterile females.

In later generations, workers of various sizes are produced. Larger major workers typically guard the nest, battle intruders, and forage for food; smaller minor workers generally expand the nest and care for the young. The larvae and pupae must be fed and tended or they die. Larvae are legless and grub-like, later pupating in tough silken, tan-colored cocoons, which sometimes are erroneously referred to as “ant eggs.”

The black carpenter ant queen lays eggs in early spring and again in late summer. This bimodal egg production generates two adult cohorts. Eggs that are laid in spring generate workers and sexual forms during August and September, whereas eggs laid in late summer produce only workers the following year in June and July. A mature colony typically contains about 2,000 to 4,000 individuals and produces winged males and females annually.

## Habits

Carpenter ants often establish a number of interconnected nests; the parent nest houses the queen and small larvae, and the satellite nests contain larger larvae and pupae. The parent nest of the black carpenter ant typically is established in a cavity of hardwoods, sometimes in softwoods. The nest is associated with wood that has a moisture content >15%, a situation often caused by rain, leaks, condensation, etc., in structures. The satellite nests usually are positioned in drier areas with higher temperatures that enhance larval and pupal development. The workers can move the brood among the satellite nests. There often may be several satellite nests in different locations in or around a structure.

Carpenter ant nests can be found outside or inside the house. Carpenter ant nests may occur in water-damaged wood near skylights, chimneys, drain gutters, window and door frames, wooden shingles, etc., as well as inside hollow porch posts and columns, window boxes, crawl spaces, dishwashers, etc. Sometimes, nests are found in dry areas, such as hollow veneer doors, curtain rods, small voids between the door casing and ceiling, false beams, or under insulation in attics or crawl spaces. Carpenter ants can create nests in Styrofoam insulation.

An active colony may produce a distinct, dry rustling sound (sometimes loud), similar to the crinkling of cellophane. Sounds of their chewing activity in wood often are audible. The workers may respond to a disturbance by striking their mandibles and abdomen against the

gallery walls so as to warn other colony members; these alarm signals can be quite loud.

Carpenter ants are most active at night. Large numbers of foragers emerge very soon after sunset to search for food. Foraging ants bring food back to the nest to feed the larvae; they may carry food items in their mandibles or they may consume the food and store it in their crop. Carpenter ants are omnivorous, and they feed upon a great variety of both plant and animal materials, including insects (living or dead), plant juices, fresh fruits, honey, jelly, sugar, syrup, meats, grease, fat, etc. Carbohydrates are the primary energy source for workers. One of their most common, readily available, and preferred foods is honeydew, which is a sugary substance excreted by aphids and scale insects feeding on the plants. (Landscape plants infested with these plant-sucking insects are a good place to inspect for carpenter ants.)

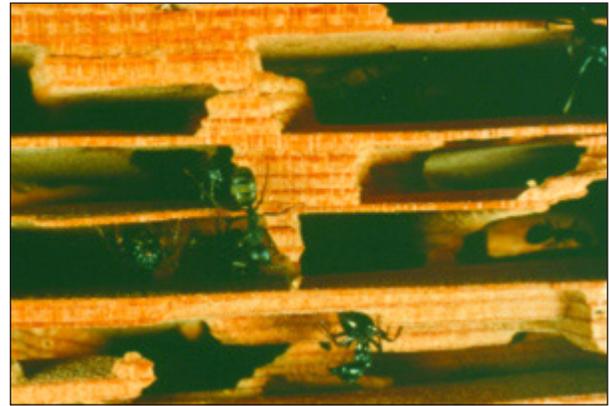
Carpenter ants travel along well-established trails between nest sites and feeding sites. Workers may forage for food as far as 100 feet from their nest. Outdoors, look for ants traveling from a tree cavity or stump to the structure. Foraging ants may travel over tree branches or vines touching the roof, electrical and telephone wires, fences next to the house, piles of firewood, logs, railroad ties, etc. They may be seen walking on plants, tree trunks, and rotten wood stumps. Their trails often extend through the lawn.

The carpenter ants' food preference appears to change on a seasonal basis, which is related to the typical brood production cycle. The larvae require protein-based foods (the quantity and quality of nitrogen in the protein are key factors that affect ant growth and development). A field study in Virginia showed that *C. pennsylvanicus* protein collection peaked in June and again in September, months when older larvae were present in the nest.

### Characteristics of Damaged Wood

Carpenter ants chew wood with and across the grain, creating irregular, clean galleries (Figure 4). The gallery walls are very smooth and sculpted, with a sandpapered appearance. There is no soil as is found in subterranean termite workings.

Carpenter ant borings consist of wood shavings that resemble pencil sharpener shavings (Figure 5). The ants carry the wood shavings and deposit them outside the nest; piles of shavings may be found beneath nest openings (sometimes called “windows”). The wood shavings often contain portions of insects, empty seed husks, and remnants of other food items.



**Figure 4. Carpenter ant galleries in wood.** (Photograph courtesy of Laurel D. Hansen, Washington State University)



**Figure 5. Carpenter ant frass.** (Photograph courtesy of Dave Shetlar, The Ohio State University, Entomology)

## Integrated Pest Management

### Prevention

Elimination of high moisture conditions is an essential aspect of carpenter ant management. Correct moisture problems such as leaking roofs, chimney flashing, or plumbing; poorly ventilated attics or crawl spaces; and blocked gutters. Replace rotted or water-damaged wood and eliminate wood-to-soil contact. Remove dead stumps within about 50 feet of the house, if practical. Prune broken limbs from trees and seal holes in the trunk. Seal cracks and crevices in the foundation, especially at entry points of utility pipes and wiring. Trim all trees and bushes so branches do not contact the house. Be sure to store firewood off the ground away from the house. Consider using non-organic mulches near the house in areas where carpenter ants are common.

### **Inspection**

The most important and often most difficult aspect of carpenter ant control is locating the parent nest and satellite nests. Furthermore, more than one colony may be present in the structure or on the property. Once the nest locations are found, control measures can be implemented. The nests can be removed physically (for example, by using a vacuum) or by an insecticide treatment. The carpenter ant queen must be killed in order to eliminate the colony.

It is useful to communicate with residents during the inspection process. Residents often know where ants have been observed, where large numbers are most prevalent, movement patterns, current or past moisture problems in the structure, if swarmers have been seen, location of sawdust-like material in piles, etc.

Chemical flushing agents sometimes are used to help locate the nests. A household aerosol spray containing pyrethrins and piperonyl butoxide, applied directly into cracks, crevices, or holes, will excite the ants by its repellent action, causing them to come running out, thereby revealing the presence of their nest in some cases.

### **Insecticide Treatment**

It generally is ineffective to simply apply an insecticide spray or dust around an infested area without locating and treating the nests. Although foraging workers will contact the insecticide and die, those carpenter ants inside the nests, including the queen and developing larvae, will not be affected to any great extent. Chemicals with a rapid “knock down” should not be applied to trails since they will eliminate the ants on the trail but likely will have no effect on the colony.

Dust formulations are useful when a nest is located in a wall void. Apply the dust via drill holes approximately three to six feet on either side of sites where ants are

entering so as to increase the likelihood that the dust contacts the nest. Sometimes, a series of holes are drilled at 12-inch intervals in infested timbers in order to intercept nest cavities and galleries. Each hole can later be sealed by inserting a dowel, small cork, or an appropriate sealant and then touched up with paint so as to leave no visible signs of repair.

Aerosol spray treatments to the nest can be effective, particularly if considerable insulation is present. Insecticidal vapors can spread within the wood to penetrate inaccessible areas of the nest, aiding in colony eradication. Areas adjacent to the nest also must be thoroughly treated with a residual insecticide.

Perimeter treatments are used outside the structure to deter ant entry. All breaks where ants can enter the home need to be treated, and a perimeter spray should be applied against the foundation wall, typically two feet up and three feet out. A perimeter spray application generally includes spraying the ants’ foraging trails with a non-repellent chemical so as to increase exposure of foraging ants. The treatment also should be applied under the lower edge of siding, around window and door frames, and around the chimney flashing. During the summer, a perimeter treatment should be re-applied every 4 to 6 weeks or within a week after a heavy rain.

Baits can provide control of carpenter ants. Baits need to be a readily accepted food source that is carried back to nesting sites to eliminate the queen, brood, and workers. When baiting, it is very important to locate the carpenter ant foraging trails. It is much more effective to place baits on or near foraging trails and ants’ entrances into the structure rather than placing baits randomly around the structure. Baits need to be contained in childproof bait stations indoors. Liquid and granular bait formulations often are used outdoors.

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