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Carpenter Ants

This publication is a supplement of (EB0818) [Carpenter Ants: Their Biology and Control](#). It provides additional information which has been published by Laurel Hansen, Ph.D. of Spokane Falls Community College. Dr. Hansen conducted her research on carpenter ant biology and behavior under the guidance of Dr. Roger Akre, at the Department of Entomology of Washington State University. The information below is based on observations and collections of this species only. A total of 6 species are found in Washington but *C. modoc* dominates.



Camponotus modoc

is the most common carpenter ant found in structures in western Washington.

Shown at left: Dorsal view of the adult stages of the carpenter ant:

Top left--Queen

Top right--Male

Bottom left--Minor worker

Bottom middle--Intermediate worker

Bottom right--Major worker.

Do You Have Carpenter Ants?

The presence of a few foraging ants in the home, or 1 or 2 winged queens during swarming times does not mean you have an infestation. These foragers may merely be scout ants seeking food or nesting sites or queens that have flown in an open door.

Foraging ants have been seen entering homes along telephone wires or along branches touching the roof or even from ground trails that come under a door. In such cases, the house may be a nesting area.

If ants are coming in, there may be a nest outside the house and eventually they may establish satellite colonies in some part of the structure. Be certain they are carpenter ants and not moisture ants, termites or yellowjackets.

Evidence of Infestation

- **Presence of ants (workers or winged reproductives):** An occasional ant may be a scout looking for food and may not indicate the presence of a nest, but continuous or numerous ants are a sign of nesting.
- **Sawdust:**
Accumulating in piles or caught in spider webbing; has a finely-shredded appearance. Do not confuse with small sawdust from construction.

- **Trails:** Detailed discussion later.
- **Sounds:** Rustling or tapping noises produced when disturbed ants rasp the substrate with their mandibles or gasters or when excavating wood. (Other insects such as the golden buprestid or yellowjackets nesting in wall voids also produce sounds.)

Type of House Likely to be Attacked

Dr. Hansen's research showed that some common elements accompanied infestations. Although other types of structures were attacked, most infestations were in houses with these characteristics:

- Wood frame
- Crawl space
- Cedar or plywood siding
- Moderately to gently sloping roof
- 5-25 years of age
- Vegetation (trees and shrubs) surrounding the house
- "Structures located near the edge of the forest were more liable to attack than those located further away." This is because the ants which have well-established nests in trees or stumps can easily move to the nearby house and establish satellite colonies.

Nests Location

Most nests of *C. modoc* which could be found were associated with (in order of frequency):

- Outside walls and voids - 35%
- Attic - 21%
- Ceilings - 19%
- Crawl space - 19%
- Other sites (including interior walls, roof, sill plate, and supports in crawl space and stacked lumber)
- Other researchers have reported that ants show a light preference for moist wood with decay fungi but that sound wood is also mined.

Nests have been found in:

- Porch pillars
- Support timbers
- Window framing and sills
- Roofs
- Shingles
- Siding
- Girders
- Joists
- Studs
- Casings of houses, garages and other buildings
- Insulation
- Drawers of dressers and cabinets
- Behind books
- In hollow doors
- Under floors
- Attic spaces
- Buried wood, stumps or construction debris

Nest Location Outside Structures (Natural Areas or Landscape)

- Forest (within 50 meters) - 27%
- Live trees (excavate heartwood; enter by knotholes, wounds, etc.) - 17%
- Dead trees, stumps or logs, buried wood - 16%
- Wood debris - 8%
- Decorative wood in landscape - 7%
- Stacked lumber - 3%
- Firewood - 3%

Number of Colonies

Carpenter ants typically have a parent colony in outside nesting areas, such as live or dead trees, stumps, logs or decorative landscape wood.

When the colony grows larger and needs room to expand or the old nest becomes less suitable, they expand to form satellite colonies. These satellite colonies are placed in nearby structures presumably because the heated, protective structures are more conducive for the older stages.

The parent colony contains the queen, young larvae and workers, while the satellite contains the mature larvae, pupae, workers, and/or winged reproductives.

The ants move back and forth from parent nest to satellite nest to feeding areas (in nearby evergreen trees and shrubs such as Douglas fir, true fir and cedar). Sometimes they can be seen carrying mature larvae (white and grub-like) or pupae (papery cocoons).

In this study, houses had from 1-3 colonies, (average = 1.3).

If the parent nest is not found, it can reestablish satellite colonies after the pesticides have become inactive or establish new colonies in untreated areas of the house.

If several nests are found, it is important to determine if they are from the same colony (therefore one parent nest) or 2 or more different colonies (therefore several parent nests). Place 2 ants, one from each trail or nest, in a jar:

- Ants from the same parent colony coexist peacefully.
- Ants from different colonies fight.

Ant Trails

Ants move along definite trails by following a chemical scent or visual clues. These trails can be above ground or subterranean and are actually constructed by cutting away vegetation, removing pebbles, excavating soil and even by covering open trails with a roof of needles from nearby trees. Trails can vary in width from 1/8" to 3/8".

The ants from a colony will follow the same path each year even if grass has grown in it. They will clear the old trail.

Trail Locations Outside Structures

Ants follow natural contours. They will cross lawns and flower beds but often prefer the cover afforded by moving along the edges of things.

- Edge of driveway or sidewalk, mowing strips
- Under patio blocks, wood steps in landscape or wood planks
- Edge of foundation or planters or sidewalk
- Edge of lawns or flower beds
- Fence stringers
- Excavate along tree roots (easy access to crawl space via roots of trees or stumps which extend under the house)

Trail Locations Inside Structures

Again ants prefer natural, easy and protected routes:

- Edges of cabinets, furniture
- Excavated trails through insulation in wall voids
- Along wiring or plumbing which cuts through studs
- Wires or branches coming to the house
- Root channels from infested trees or stumps which go beneath the house.

Activity Along Ant Trails

- Ants are generally active along ant trails in western Washington from April to mid-October.
- Hours of greater activity are from 8 p.m.-4 a.m.; although some ants can be found at all hours.
- A sudden increase in activity occurs 5-10 minutes after sunset and is greatest from about 10 p.m. to 2 a.m.
- Temperature or rainfall doesn't seem to influence this activity.

Ants returning to nests are either:

- Larger with full (stretched) stomach so they look somewhat banded
- Carrying food such as insects.
- Some ants will be going to the feeding areas (usually trees). They are not stretched or banded. Some will be engaged in trail building (at night mostly).

Following Ant Trails to Locate a Nest

Do not disturb any trails until you locate the nests. The ants will just get sneaky and reroute the trail which may take much longer to locate.

Ants will generally be going to and from:

- Feeding areas
- Parent nests
- Satellite nests

Banded ants or ants with insects will be going from feeding grounds to parent (or satellite) nests. The young growing larvae and queen need the most food, so more ants will take food toward the parent colony, with fewer moving toward the satellite. Ants carrying larvae or pupae (papery cocoons) are moving from the parent to satellite colony.

Activity, therefore ease in following a trail, is greatest after sunset (roughly between 10 p.m. to 2 a.m.). A red light disturbs ants less than white light.

Trails may be difficult to locate since they may disappear under boards, sidewalks or go underground.

You have time. Keep watching for clues as you work in your yard or house. Don't get trigger happy and spray the trail, or you will have to start over if you want to find the nest.

What Carpenter Ants Eat

Carpenter ants cannot eat solid food. They have a very long, exceptionally thin esophagus (food pipe) that prevents them from eating solid food.

- Mostly they gather aphid honeydew or tree sap.
- Only about 1% of the ants carry insects or insect parts. Insect prey includes grasshoppers, crickets, leafhoppers, aphids, craneflies, mosquitoes, honey bees, moisture ants, thatching ants, spiders, daddy-long-legs and larvae of moths, bees, flies and earthworms.
- Human food includes candy, honey syrup, soda pop, apples, raisins and pet food.
- The ants have been observed taking "solid" food over to water where it becomes soggy. They can eat the

dissolved portions.

- They can masticate ("chew") insect parts and extract nutritious liquids.

Carpenter Ant Life Cycle

- Reproductive ants (winged males and females) leave the nest anytime from early January through June (different colonies leaving at different times). Mating takes place in swarms, with the first mating swarms noted in May (others in June, July, August and September).
- Mated queens find a suitable place to live and chew off their wings, excavate a small home and begin laying eggs. Mated queens lay eggs which become workers or queens. Unmated queens or queens which have run out of sperm can produce only males.
- By the end of the summer either workers have emerged or the larvae from late eggs become dormant. **No feeding occurs during the winter months (November, December, January).**
- The dormant phase ends about mid-January, when the queen begins laying eggs again.
- The rate of growth of a colony from one queen in the first year, or season, is very low (with only 1 or 2 dozen workers).
- It took about 3 seasons to produce even a few larger workers in Hansen's studies. The number of years it would take to produce reproductives is estimated to be 3-5 years. Therefore parent nests with larger ants or winged reproductives have been in place for a considerable period of time. Satellite nests could have reproductives in a single year because the pupae are carried from the parent nest to the satellite.

Other Facts

- If the queen dies, workers can produce eggs which become males.
- Workers must help the new adults emerge from the pupa case; without workers they can't emerge.
- At any one time only a small percentage (1%-3%) of the ants are outside the nest foraging for food and water.
- The queen and workers can eat their own eggs and smaller larvae, if the food supply is low it severely stresses the colony and retards its growth.

Managing Carpenter Ants

Finding both the parent colony in the surrounding landscape and the satellite colony (or colonies) in the structure is crucial to successful control of carpenter ants.

Many pest control operators feel they can drill and inject the entire house faster and at less cost to the homeowner than it would take to locate and treat the nest areas. Others feel they can starve out the ants by spraying only the perimeter (attic, crawl space, and foundations) at monthly intervals for a year.

However, the National Pest Control Operator's Association since 1962 has recommended and still recommends that an effort be made to locate and treat the nest areas. The Washington State Pest Control Association also recommends "careful inspection" and that "a professional attempt be made to penetrate and treat potential nesting sites." From Dr. Hansen's research, it is evident that long term success will be greater if the parent colony also is located and destroyed.

Control Approach:

Carpenter ant infestations usually involve a parent colony and one or more satellite colonies. The parent colony which houses the queen, workers, and brood requires a moist area and is usually located outside the structure unless a severe moisture problem exists within the building. Satellite colonies house workers, mature broods and may also contain winged forms. These colonies are often found within structures.

The most effective means of control begins with the location of the main colony and the satellite colonies. Clues in the location of nesting sites include extruded sawdust, foraging trails, and the presence of foraging ants.

Colonies within the structure should be controlled by a direct application of a pesticide. Boric acid dust, bendiocarb (Ficam) 1% dust, cyfluthrin, cypermethrin, bifenthrin, propoxur (Baygon) 0.5% in aerosol spray containers all are registered materials. Nests in wall voids often can be accessed through plumbing or electrical wiring. Electrical plates can be removed and an insecticide applied into the wall void along the outside edge of the electrical box. Ants follow wiring and plumbing routes through the structure. If the colony is inaccessible for direct treatment, a 1/8 inch drill bit can be used to make small holes in the walls so an insecticide applicator wand can be inserted for application of the insecticide. Dust formulations are effective against all Hymenoptera because the dust adheres to the hairy surfaces of their bodies. As they clean themselves and feed other ants and larvae, the insecticide is spread throughout the colony. This formulation is effective as long as it does not become wet, so it is used primarily in wall voids.

A perimeter spray of the structure should also be made during the season of carpenter ant activity from April through September. This will disrupt foraging trails and help to prevent re-entry from parent colonies nesting outside the structure. The exterior perimeter spray should include application against the foundation, under the edges of siding, around window and door frames, and on carpenter ant trails. In structures with a crawl space, the inside of the foundation and sill plates should also be sprayed. Cyfluthrin (Tempo), deltamethrin, bifenthrin, permethrin, cypermethrin (Demon) are all registered materials. The synthetic pyrethroids, cyfluthrin and cypermethrin, have a long residual (2-3 seasons) if placed in areas not exposed to direct sunlight and rainfall such as under the edges of siding and on the inside of foundations and on sill plates in crawl spaces.

Perimeter sprays may be recommended when the parent colony cannot be located or controlled. Examples would include structures built in forested areas where trails in natural areas are difficult to follow, in urban areas where the parent colony is located in the heartwood of a living tree, or when the parent colony is located in wood buried during construction or in landscaping. The frequency of application is dependent upon the choice of insecticides and the concentration. For materials with a shorted residual, application may be needed several times during the season. This can be reduced to an annual application or longer with the synthetic pyrethroids.

Exercise caution in handling all pesticides and be sure to read the label for both cautionary statements and use procedures.

To Find the Nest Sites

It may take some long-term observation to find the nest sites. **DO NOT DISTURB** any ant activity you can see until you have located the nests and are ready to initiate control measures. Disturbing their activity will cause the ants to develop new routes which may take you longer to find.

- Look for evidence of infestation.
- Check common nest sites in structures.
- Check common nest sites in natural areas or landscapes.
- Locate any trails inside or outside the structure.
- Observe activity along those trails to determine which way the food is moving (distended abdomens, carrying insects).
- Observe after sunset with red light.

Other Areas to Check Include:

- Around sink, dishwasher or shower areas.
- Hit beams and underflooring joists with a hammer, and listen for hollow areas.
- Look for tiny slits in beams or joists; these are air vents.
- Check attics and crawl spaces.
- Check around fireplace or furnace chimneys which may be warm and moist.
- Remove electrical outlet and light switch plates and look for evidence: pupal skins, sawdust, ants.
- Check spider webs for evidence (sawdust, etc.).
- Check firewood or lumber especially if it is stacked against the house (a poor practice).

- Check areas hidden by vegetation (prune the back side of evergreen shrubs which may provide shelter for trails and access to the house and increase moisture of the walls.
- Check for evidence of leaking or temporarily plugged (ice, debris) gutters during rainstorms.
- Remove shrubs that block vents or prune them at the base to allow good air flow.
- Check for condensation in the crawl space or attic due to inadequate ventilation.

Additional Resources/References

You may wish to listen to Dial Extension tapes on Carpenter Ants. They are available to Washington State callers at (206) 296-3425 or toll free during business hours at 1-800-325-6165 and ask for extension 6-3425. Request: **#1261: Carpenter Ants**, or **#1222: Choosing an Exterminator** (For more information on "DialExtension", see: <http://www.metrokc.gov/wsu-ce/DialExtension.htm>)

The following publications are also available through your local WSU Extension Office:

- [EB 0671 Identification and Habits of Key Ant Pests in Washington](#)
- [EB 0818 Carpenter Ants: Biology and Control](#)

The following publications have good information and graphics about carpenter ants but be aware that chemical recommendations listed there may not be legal in Washington State. Diazinon and Dursban (chlorpyrifos) in particular will soon be unavailable for home use in Washington.

Jack DeAngelis, Ph.D., retired Oregon State University Extension Entomologist has some good information on PNW carpenter ants at http://www.livingwithbugs.com/carp_ant.html

University of Kentucky also has a very good [carpenter ant publication](#).

For further information contact your local [WSU Extension Office](#).

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