

Chapter 5

Order: Hymenoptera (pt.1- Wasps, Bees, etc.)

After completing this chapter you will know which wasps and bees are detrimental to structural wood. You will learn their life cycles, how to identify them, their biology and habits, and how to recognize their damage.

The insect order hymenoptera consists of the wasps, hornets, bees, and ants. Ants will be covered in the next chapter. The order hymenoptera contains the smallest known insect: a parasitic wasp that attacks the eggs of certain aquatic insects. It measures only 81.2 ten thousandths of an inch [0.21mm].

The order hymenoptera contains some of the most interesting social insects. Because of their ability to inflict a venomous sting, some hymenoptera may cause great discomfort – even death – to man and other animals. Others are very important to man by supplying us with paraffin, honey, and through crop pollination. Still others are beneficial by attacking and parasitizing other less desirable insects.

All of the more than 100,000 described species of hymenoptera undergo complete metamorphosis.

Some important hymenopterous pests that you may encounter include:

- Family Siricidae: horntails
- Family Anthophoridae: carpenter bees
- Family Xyelidae: sawflies

Family Siricidae: Horntails

These wasps are large, an inch [25mm] or more in length. The female deposits her eggs in dead, diseased, or dying trees, where they complete their development. If the trees are in the wild, the life cycle continues until the tree gets destroyed by the ravages of successive generations of this wasp. When lumber from diseased or dead trees is used as construction material – which is against most building codes / this is called “cull lumber” – infested wood may end up in the walls or other construction elements of a home.



Figure 5 - 1

Mature horntail adults often must use their strong jaws to eat their way through up to ½ inch of wallboard to emerge from their pupal chamber. The holes they leave in drywall, and their large size, make them of great concern to homeowners who encounter them. They do not have the ability to sting, although the elongated ovipositor [egg-laying organ] protruding from under the abdomen of the female hornet has startled more than a few homeowners and uneducated PMPs.

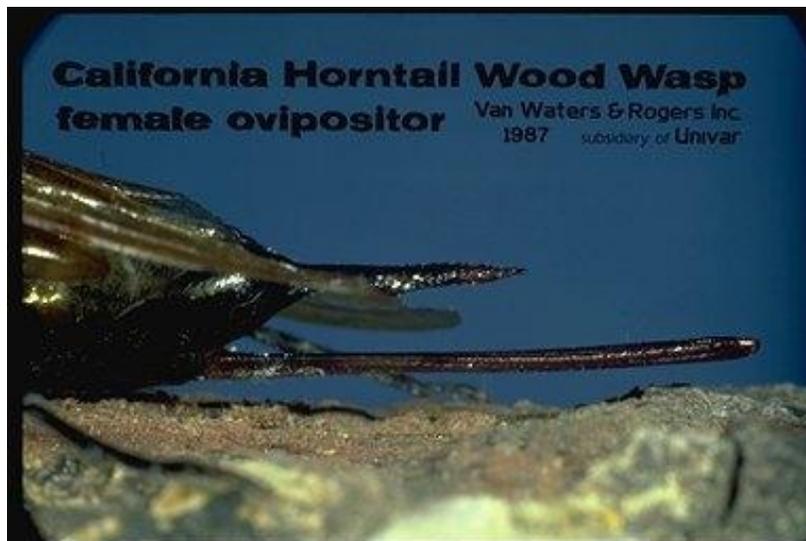


Figure 5 - 2

There are about 70 species of this family worldwide, about 18 of them occurring in North America. Only two species are common to the eastern United States: Sirex cyaneus [the Blue Horntail] and Tremex columba.

Identification

The name horntail refers to the horny plate on the last abdominal segment of the female. Additionally, she has a rearward projecting ovipositor, as in figure 5 – 2 above.

The species *Sirex cyaneus* has a bluish-black abdomen and reddish-brown legs. The last pair of legs, in the males only, are bluish-black. The wings are transparent, and are grayish-brown near the wingtips. The wings of the males have a slight yellow caste. Antennae are long. They will fly outdoors in bright sunshine, or indoors when interior lighting is on.

Horntail larvae, which typically require 2 – 3 years to develop, may reach a length of 1 9/16” [40mm], are whitish in color, and slightly “C” shaped.

Life Cycle and Development

Adult females deposit their eggs in susceptible trees. Eggs are usually deposited from mid-August to mid-October. Female horntails carry a fungus near the base of the ovipositor, which is inoculated into or onto the wood when laying eggs. The fungus grows within the wood, and is important to developing larvae [see figure 5 - 3]. This fungus is always associated with horntails.

Fully grown larvae can measure up to 1 9/16” [40mm]. Then they pupate. Their tunnels may measure 1 – 2 feet long, and will be filled with a dust-like frass mixed with cast-off larval skins. The life cycle is often completed in a year, but may extend to 2 or three, or as many as five years, depending on the environmental conditions of the wood.

Pupation occurs within an inch of the surface of the infested wood

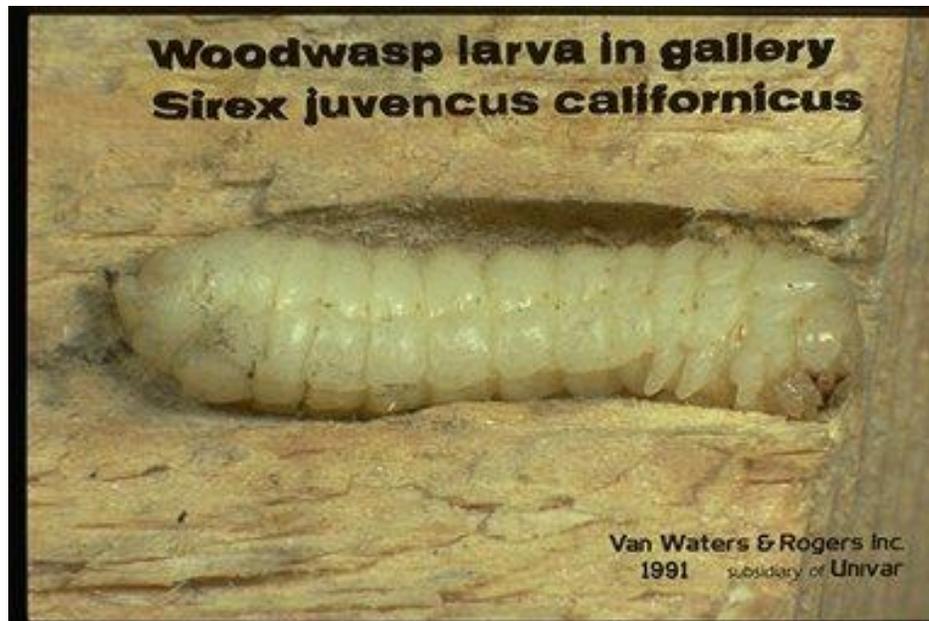


Figure 5 - 3

Types of Wood Attacked

Members of the genus *Sirex* attack only softwoods, while *Tremex* species attack only hardwoods. Cut wood is not vulnerable.

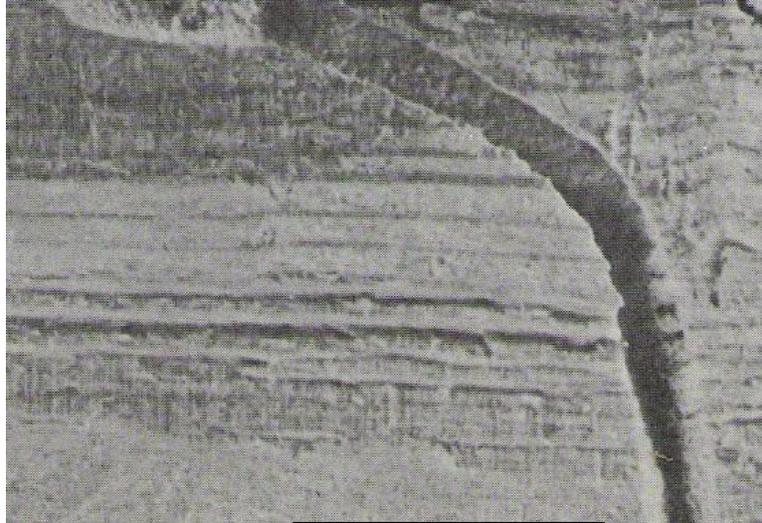


Figure 5 - 4

Proper kiln-drying of lumber will destroy all life stages.

Diagnostic Characteristics of Infested Wood

In most instances, the inspector will not see the damaged wood, since it is not accessible. The damage will often be in studs, joists, furring strips, subfloors, sills, etc. (fig. 5-4) When adults emerge from these wooden members, they are within a wall void. They will then use their strong jaws to drill holes, through which they emerge into the structure. These holes may be in plaster, wall paper, carpets, linoleum, hardwood floors, wallboard, etc., and will measure about $\frac{1}{4}$ " in diameter. Occasionally, they may emerge from firewood that has been seasoned outdoors, then brought inside.

Reinfestation Within Structures

Reinfestation does not occur because the wood is too dry for the next generation. The amount of damage done by these pests is usually of little importance: the holes in the walls or floors, and a large wasp buzzing through the house will be of greater importance to the homeowner.

Family Anthophoridae: Carpenter Bees

The large carpenter bees are placed in the genus *Xylocopa*, of which seven species are found in North America. The eastern carpenter bee, *Xylocopa virginica*, is common to the eastern United States. Larval carpenter bees do not feed on wood: wood damage is caused by adult carpenter bees preparing galleries in which to place their eggs.

Carpenter bees are not social insects, thus do not live in nests or colonies

Identification

The eastern Carpenter Bee resembles a bumble bee, however they differ in the following respects:

- The dorsum of the abdomen is naked
- Dense hairs on the hind legs of the females
- Nest in wood



Figure 5 - 5

Female carpenter bees do possess a stinger, but must be greatly provoked to ever use it. Males cannot sting.

Life Cycle

Adult carpenter bees overwinter within the galleries their parents constructed, and within which they developed. In the spring, they mate and enlarge the galleries already present in the wood, or build new ones. New galleries are started by a female boring a perfect $\frac{1}{2}$ " circular hole into the surface of wood, across the grain, about the length of her body (fig. 5-6).



Figure 5 - 6

Then, she turns at a right angle, and continues the gallery, usually with the grain, for 4 – 6". Old galleries may be up to ten feet long after re-use and expansion. The female will store provisions of pollen and regurgitated nectar ["bee bread"] at the end of a gallery, deposit an egg, then partition the cell from the rest of the gallery with a flimsy plug of chewed wood pulp. The process is repeated, creating a chain of 5 – 6 cells.



Figure 5 - 7

The egg furthest from the entrance / exit hole will develop most quickly, and in an average of 36 days development will climb over the bodies of its siblings to emerge.



Figure 5 - 8

New adults emerge about mid-summer, and will not mate until the following spring. They may store pollen in galleries in which they overwinter.

Diagnostic Characteristics of Infested Wood

Carpenter bees will often be seen flying about near the wood they are infesting. A round entrance hole, about 1/2" in diameter, bored across the grain, is your first clue.



Figure 5 - 9

These entry holes are often bored on the bottom or rear surfaces of wood, especially if it has not been treated with a “hard” finish, such as oil-based paint, varnish or shellac.

Male carpenter bees are extremely territorial, and will aggressively pursue humans, hovering at face level to try to intimidate. Keep in mind these are males and cannot sting.

Look for signs of carpenter bees on wood outside the structure. Check eaves [as in figure 5 - 10], trellises, under railings, outdoor furniture, fence components, and below siding.



Figure 5 - 10

Their excrement, which is brownish-yellow, and the waxy remnants of the cell dividing walls, may stain the areas below their entry holes (fig 5-10, 5-11).



Figure 5 - 11

Reinfestation In Wood

Carpenter bees will continue to reinfest the wood and damage may become extensive over time.