

WOOD-BORING BEETLES IN HOMES

Integrated Pest Management in the Home

Three groups of wood-boring beetles—powderpost, deathwatch, and false powderpost (Table 1)—invade and damage wood furniture as well as structural and decorative wood inside of buildings. The beetle larvae feed in and do most of the damage to wood, and when they reach the adult stage, they emerge through round exit holes, which they create by chewing through the wood surface. Adults of some species also bore exit holes through plaster, plastic, and even soft metals that might cover the underlying wood.

You might see other wood-boring beetles such as flatheaded or roundheaded borers and bark or ambrosia beetles in your home if you store infested firewood inside. However, these typically are forest insects that won't attack wood structures or furniture. They begin their life cycles on declining trees that are old or that have sustained fire or insect damage. Sometimes these forest insects are present in trees when they are milled into wood products, and they might cause alarm when they emerge from infested wood used in newly constructed buildings. However, they aren't able to reinfest the wood in these structures.

Certain species of wood wasps also might emerge from infested wood used in new structures. See *Pest Notes: Wood Wasps and Horntails* for more information. Invasive wood-boring insects often arrive as hitchhikers from other continents on solid wood packing material such as pallets or in a ship's dunnage, and some of the key beetle pests of wood in structures have likely established worldwide distributions this way.

IDENTIFICATION AND LIFE CYCLES

Powderpost Beetles

A subfamily of beetles in the family Bostrichidae (formerly referred to as the family Lyctidae) are known as powderpost beetles (Fig. 1), because larvae create a fine, dustlike powdered frass (a mixture of feces and wood fragments) that has the consistency of baking flour or talcum powder. This boring dust is packed into the larval galleries (feeding channels) in the wood but occasionally falls out of exit holes into small piles on floors or other surfaces.

This fine, powdery frass distinguishes powderpost beetles from other wood-boring beetles in homes (Fig. 2). It also differs from the larger, granular, and almost pepperlike pellets drywood termites leave behind; if you look closely at termite pellets, you will see they have ridges on their sides.

Powderpost beetles attack hardwoods, apparently because these woods have pores into which they can lay eggs; softwoods don't have such pores. The large pores in bamboo also make it a favored host material for powderpost beetles. In addition to large pore size, powderpost beetles also prefer wood



Figure 1. Adult powderpost beetle, *Lyctus planicollis*.



Figure 2. Powderpost beetles produce much finer boring dust (left) than other wood borers such as deathwatch beetles in the family Anobiidae (right).

with high starch content; the starch content in softwoods is nutritionally low for these beetles. They will attack wood that is very dry and that has a moisture content as low as 8%.

Table 1.

Frequently Encountered California Species of Powderpost, Deathwatch, and False Powderpost Beetles.¹

Group name	Common name	Latin name
powderpost (Lyctinae) ²	old world lyctus beetle	<i>Lyctus brunneus</i> (Stephens)
	southern lyctus beetle	<i>Lyctus planicollis</i> LeConte
	western lyctus beetle	<i>Lyctus cavicollis</i> LeConte
deathwatch (Anobiidae)	Pacific deathwatch beetle	<i>Hemicolus gibbicollis</i> (LeConte)
false powderpost (Bostrichidae)	black Polycaon	<i>Polycaon stoutii</i> (LeConte)
	leadcable borer	<i>Scobicia declivis</i> (LeConte)

¹ Based on a survey conducted in March 2010 of some of the principal insect collections in California—Bohart Museum, California State Collection of Arthropods, and Essig Museum.

² Recently a taxonomic change has been recommended to incorporate the former family Lyctidae as a subfamily Lyctinae within Bostrichidae. However, the biology and field visual signs of damage for the subfamily Lyctinae remain unchanged.

PEST NOTES

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Adult powderpost beetles most often select and lay eggs in wood such as oak, ash, hickory, mahogany, and walnut, and infestations are most likely to occur in wood paneling, molding, flooring, window and door frames, plywood, bamboo articles, and furniture. Infestations can occur if beetles or larvae are brought into a building in furniture, firewood, or wooden decorative articles.

Sometimes the only sign of infestation is the tiny, round exit holes made by the emerging adult beetles (Fig. 3). Once they emerge, the winged adults spread to other wood surfaces where they deposit eggs onto unfinished surfaces or in cracks or other openings. They also tend to fly toward light, so you'll typically find dead adults on windowsills after they have tried to disperse.

They have a life cycle ranging from 3 months to more than 1 year, depending on temperature, humidity, and the nutritional quality of the wood. Adult powderpost beetles usually are shades of brown to red. Species frequently encountered in California structures include the old world lyctus beetle, *Lyctus brunneus*; the southern lyctus beetle, *Lyctus planicollis*; and the western lyctus beetle, *Lyctus cavicollis*.

Deathwatch Beetles

Wood-boring beetles in the family Anobiidae are known as deathwatch beetles (Fig. 4). They are closely related to the drugstore and cigarette beetles, which are stored-products pests. Adults communicate with each other and probably locate mates by tapping their heads against wood, usually at night. Deathwatch beetles might have acquired their name during medieval times in Europe when people heard the tapping while sitting up with a sick or dying person during the night. Legend has it they attributed the sound to the tapping of the staff of the scythe of the grim reaper coming to take away the soon-to-be deceased.

Deathwatch beetles primarily infest softwoods, especially Douglas-fir, which is used in girders, beams, foun-

dation timbers, and some types of furniture. You'll typically find this beetle in old wood or wood that is partially decayed. Deathwatch beetles prefer wood that is more moist—greater than 14% moisture content—than what powderpost beetles prefer, so they might be less of a problem in houses with central heating and air conditioning; you are more likely to encounter them in damp sub areas, basements, or outbuildings. Unlike powderpost beetles, deathwatch beetles in California are more likely to invade structures from wild population sources located outdoors.

Deathwatch beetle larvae fill their galleries with very small pellets of frass (smaller than the pellets drywood termites produce), which gives their frass a slightly grittier consistency than that of powderpost beetles but not as coarse as that of false powderpost beetles. However, like powderpost beetles, the larvae (Fig. 5) do most of the damage, and their frass is packed in the galleries and is visible only when larvae or adults push it out through emergence holes. Holes that deathwatch beetles leave can be of various sizes, whereas those from powderpost or false powderpost beetles tend to all be the same size.

Adults are reddish to dark brown and lay eggs in crevices, small openings, or pores of unfinished wood. It can take 2 years to complete each generation. The species frequently encountered in California is the Pacific deathwatch beetle, *Hemicoleus gibbicollis*.

False Powderpost Beetles

Wood-boring beetles in the family Bostrichidae are sometimes known as false powderpost beetles. False powderpost beetles colonize a variety of hardwoods and sometimes softwoods. Tropical species of Bostrichidae frequently are imported into the United States on bamboo articles or on woods such as Philippine mahogany or lauan.

Unlike female powderpost and deathwatch beetles, which lay their eggs while on the wood surface, false powderpost beetle females bore a tunnel, or egg gallery, into wood or other ma-



Figure 3. Powderpost beetles leave tiny, round exit holes in wood after they emerge as adults.



Figure 4. Adult deathwatch beetle.



Figure 5. Deathwatch beetle larva.

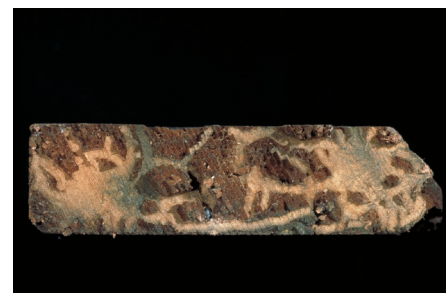


Figure 6. Frass-packed galleries made by leadcable borer, a false powderpost beetle, in redwood. This frass is much coarser than that produced by powderpost or deathwatch beetles.

terials then deposit their eggs in pores or cracks within the tunnel. Larvae of false powderpost beetles pack their galleries very tightly with frass that has the consistency of coarse powder simi-

lar to powdered borax soap (Fig. 6). The texture of this frass is the most gritty of the three groups and distinguishes false powderpost beetles from true powderpost beetles and deathwatch beetles.

In buildings, false powderpost beetles infest floors, furniture, hardwood paneling, and other wood materials. Adults of some species bore through soft metal such as lead and silver as well as plaster and other nonwood materials, searching for sites to deposit eggs or protection from weather extremes. This gives rise to the common name “leadcable borer” for one species, *Scobicia declivis*, because of its habit of boring into the metal covering of suspended telephone or electrical cables.

This species also is known for its habit of attacking wine-soaked oak in wine barrels or the corks in alcohol specimen vials in insect collections; hence it also has been called the “cask borer.” In the wild in California, the leadcable borer frequently is associated with dying branches on native oak and walnut trees. In urban and rural outdoor settings, it can be found in association with eucalyptus and other ornamental hardwood trees.

Adult false powderpost beetles are dark brown or black, sometimes with reddish mouthparts, legs, and antennae. Adults of most species are about 1/4 inch long, but one very abundant native California species, the black Polycaon, *Polycaon stoutii*, is 1 1/2 to 2 inches long. Adult false powderpost beetles have a humpback appearance, so you typically won't see the head if you view the beetle from above (Fig. 7). This characteristic also is true of deathwatch beetles.

The duration of the false powderpost beetle life cycle varies. Most species develop in 1 year, but the black Polycaon can take up to 20 years to develop. In California, this species frequently is encountered in hardwood flooring from oak, ash, walnut, cherry, or even madrone and is thought to infest the raw flooring material at the mill or holding areas prior to construction.

MANAGEMENT

The first step in managing wood-boring beetles is identifying the group involved in the problem. Two quick diagnostic tests, the ballpoint pen test and the frass test (Table 2), can help distinguish among the three groups of wood-boring beetles. Detection can be difficult, because much of their life cycle takes place beneath the wood surface and in hidden wood junctions where a homeowner or inspector might not easily detect them.

Wood-boring beetles are difficult to control once an infestation has begun. Therefore, prevention is the best management method. Protective measures should take place at every stage of lumber processing and handling including lumber mills, plywood mills, lumberyards, furniture-manufacturing factories, and building-construction firms.

Sanitation is the most important aspect of prevention. Remove and destroy dead tree limbs around buildings or near any area where wood products are stored. Destroy scrap lumber and other wood products before infestation occurs.

For some pests such as the black Polycaon false powderpost beetle, curtailment of exterior mercury vapor lighting around lumberyards and warehouses is recommended to reduce the chances of attracting the beetle to the site. Kiln drying lumber destroys beetle infestations, although it doesn't prevent re-infestation. Heat treatment of the core of imported wood packing material to 133°F for 30 minutes to combat these

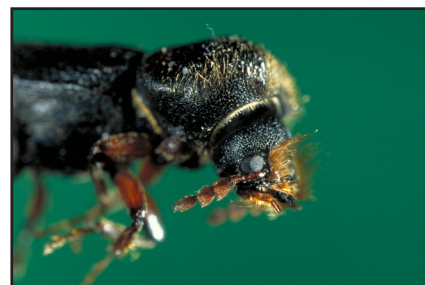


Figure 7. Head and thorax of a leadcable borer showing the humpback appearance typical of false powderpost beetles and deathwatch beetles.

types of pests is an important phytosanitary regulation adopted by current international convention.

Thoroughly inspect materials used for constructing buildings before use to ensure they don't contain wood-boring beetles. Protect wood from infestation by painting or varnishing to seal pores, cracks, and holes where these beetles could lay eggs. To keep from accidentally introducing wood-boring beetles into a finished structure, inspect furniture and other objects before bringing them into buildings. Remove and fumigate objects that show signs of beetle infestation.

When bringing in firewood, limit yourself to only what you will burn that day. Also, inspect buildings for signs of wood-boring beetle damage. Look for exit holes where adult beetles have emerged, and be aware of any new beetles accumulating on your windowsills. Once you have located galleries, tap out the frass to aid in identifying the pest (Table 2).

Table 2.

Two Methods for Distinguishing Powderpost, Deathwatch, and False Powderpost Beetles.

Group name	Ballpoint pen test ¹	Frass test ²
powderpost (Lyctinae)	Only the tip of the pen fits into the exit hole.	Feels like talcum powder.
deathwatch (Anobiidae)	The tip and part of the angled face fit into the exit hole.	Feels gritty.
false powderpost (Bostrichidae)	The entire point of the pen usually fits into the exit hole.	It is difficult to dislodge the frass from the hole.

¹ Insert the tip of a click-type, refillable ballpoint pen into the exit hole of the beetle.

² To determine the texture of frass, a mixture of feces and food fragments, rub it between your fingers.

You can heat small wooden items—but not those containing fabrics, pelts, or paints—in an oven at 120° to 140°F for 6 hours. You also can place items in a deep freezer at 0°F for 72 hours. Longer treatments might be necessary if the wood is thicker than 2 inches.

Remove and replace infested structural wood whenever possible to eliminate beetles. Destroy infested wood by burning or take it to a landfill. Where removal isn't possible, liquid insecticides can be applied to bare structural wood. The most effective and safest materials are pesticide formulations containing sodium borate (e.g., Tim-Bor and Bora-Care), which a licensed pest control operator must apply. These materials must penetrate wood to kill beetle larvae that are within, so finished wood can't be successfully treated. Depth of penetration is enhanced in moist wood; if moisture is less than 15%, penetration might occur only in the top 1/4 inch.

For extensive powderpost and death-watch beetle infestations within a building or where inaccessible structural parts of a building are involved, many professional pest control operators offer whole-building fumigation. Homeowners should bear in mind this method doesn't prevent reinfestation; a new infestation could be initiated as soon as the fumigant is removed from the structure. Research results have demonstrated that fumigation works best to control adults and larvae; wood-boring beetle eggs require a higher dose of fumigant.

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Pesticides are poisonous. Always read and carefully follow all precautions and safety recommendations given on the container label. Store all chemicals in the original, labeled containers in a locked cabinet or shed, away from food or feeds, and out of the reach of children, unauthorized persons, pets, and livestock.

Pesticides applied in your home and landscape can move and contaminate creeks, rivers, and oceans. Confine chemicals to the property being treated. Avoid drift onto neighboring properties, especially gardens containing fruits or vegetables ready to be picked.

Do not place containers containing pesticide in the trash or pour pesticides down the sink or toilet. Either use the pesticide according to the label, or take unwanted pesticides to a Household Hazardous Waste Collection site. Contact your county agricultural commissioner for additional information on safe container disposal and for the location of the Household Hazardous Waste Collection site nearest you. Dispose of empty containers by following label directions. Never reuse or burn the containers or dispose of them in such a manner that they may contaminate water supplies or natural waterways.

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