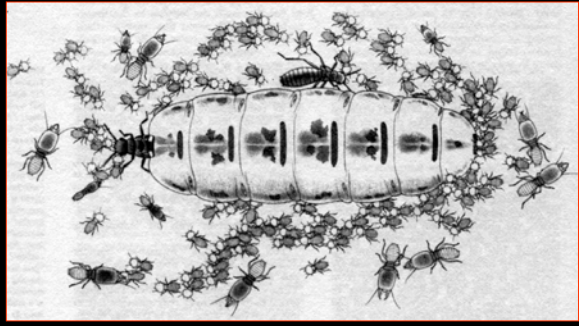


The Termites and Powderpost Beetles



Bob Gara

The Termites: Isoptera

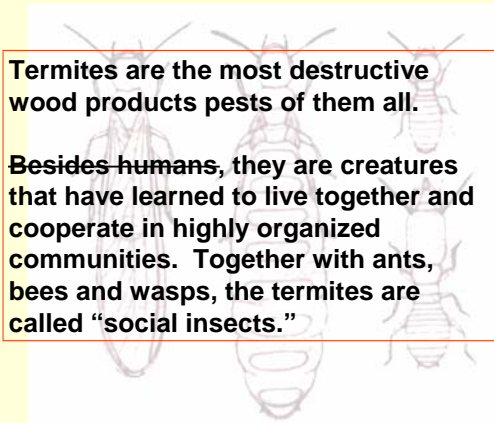


Some primal termite knocked on wood; and tasted it,
and found it good. That is why your Cousin May
fell through the parlor floor today.

- Ogden Nash

Termites are the most destructive wood products pests of them all.

Besides humans, they are creatures that have learned to live together and cooperate in highly organized communities. Together with ants, bees and wasps, the termites are called "social insects."

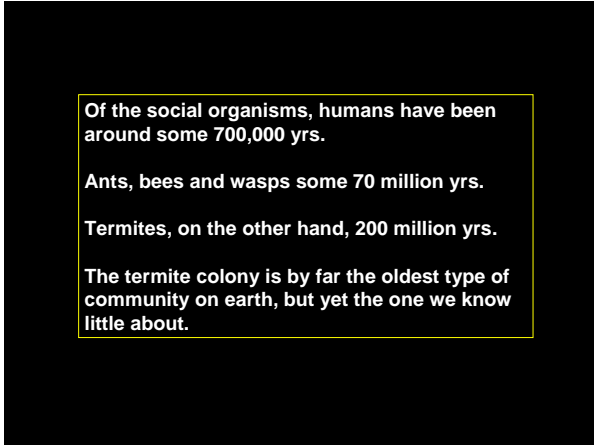


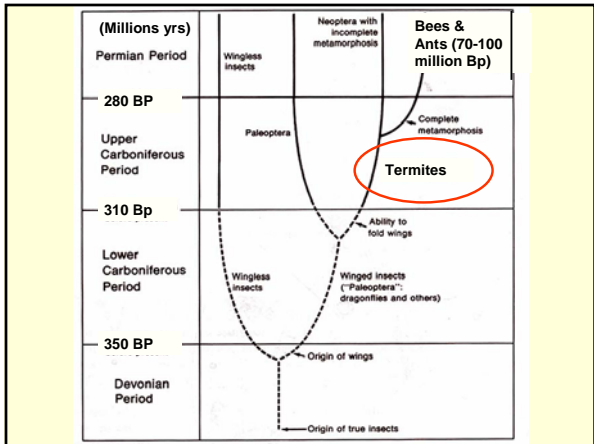
Of the social organisms, humans have been around some 700,000 yrs.

Ants, bees and wasps some 70 million yrs.

Termites, on the other hand, 200 million yrs.

The termite colony is by far the oldest type of community on earth, but yet the one we know little about.





A Perspective On Termites

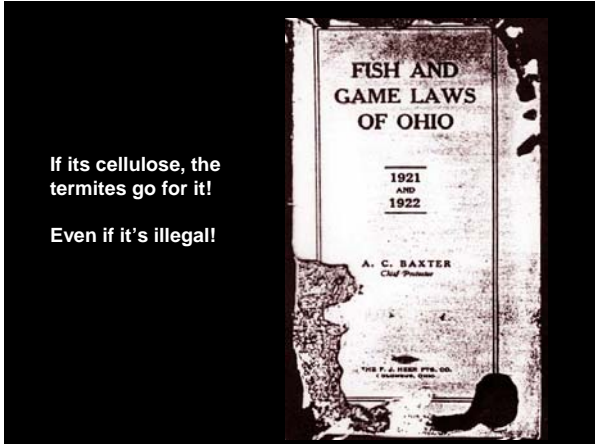
- Live in colonies and utilize wood or other cellulose substrates as food.
- In general, they are tropical and awful problems in the subtropics and tropics.
- Unfortunately a few species do well in the temperate parts of the world too.
- The tremendous destructive potential of termites has led Americans to create myths and exaggerations of their biology.

1. Enlarged queens lay 1000's of eggs/day and live for 25yrs. Not quite for U.S. termites, but some African termites do.
2. Termites depend on protozoans living in the hind gut to digest cellulose. True for some primitive termites, but > 75% have cellulase.
3. Termites live underground constructing earthen tunnels as protective passages to sources of wood. True for many, but others forage for food above ground.
4. All termites infest wood and cellulose products important to people. There are about 45 native termite species in the U.S., but only three species are of economic importance.

The three native species of termites that are horrible pests are:


1. *Reticulitermes hesperus*, the western subterranean termite.
2. *R. flavipes*, the eastern subterranean termite.
3. *Zootermopsis angusticollis*, the Pacific dampwood termite.






If its cellulose, the termites go for it!

Even if it's illegal!



Commercially important termites have adapted well to the urban environment. For example, the eastern subterranean termite has expanded northward much farther in urban centers than its buddies in the forests: the natural habitat.

Quite simply, soil moisture and temperature conditions around buildings allow for this northward expansion.

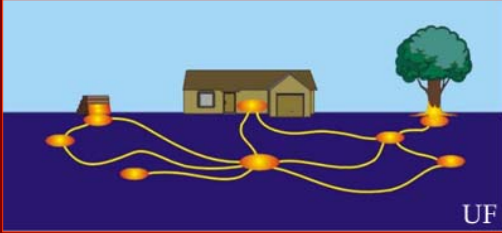


Modern construction methods also makes it easier for entrance of termites into buildings.

Modern buildings are really set up for subterranean termite infestations:

- Expansion and contraction joints installed in concrete foundations give termites access to above-ground wooden construction.
- Cracks in concrete floors
- Heating and ventilation ducts that are incorporated into concrete give access to wood in other parts of construction
- Electrical connections between the inside and outside are entrances
- Discarding wood in and around buildings etc.

FST main nest in front yard and supplementary nests around the yard and in the crawl space of the house. This is a true case history that occurred in New Orleans.



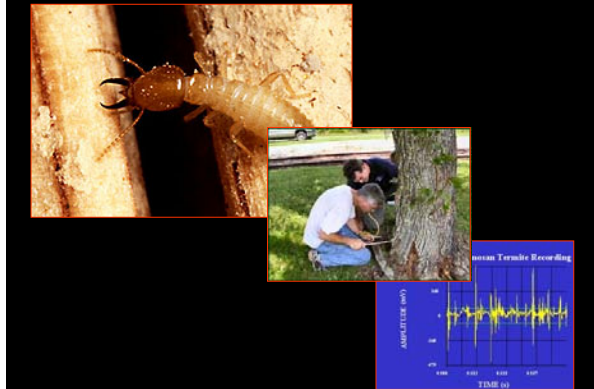
The problem was never discovered until it was too late.





Central nest of a new FST colony; 5ft below the surface, a cemented ball with the Royal Pair and six supplementary queens, whose only task was to lay thousands of eggs daily.

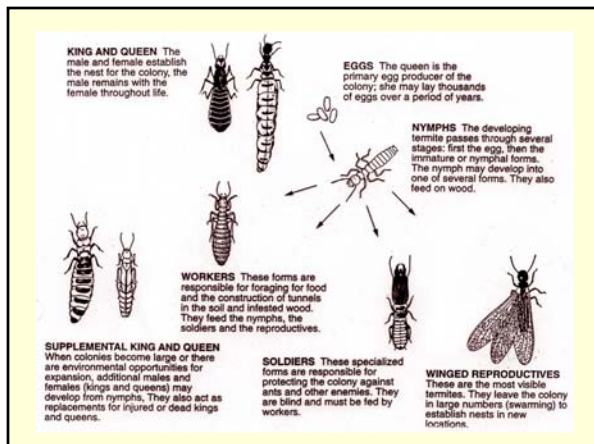
The FST: if you can't beat them, at least record their songs.



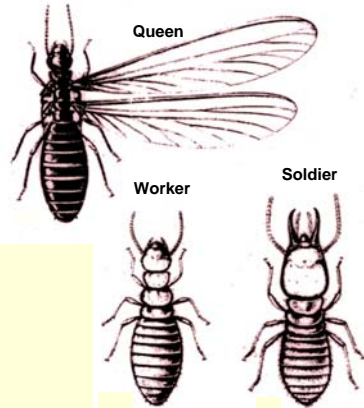
Our native termites are bad enough:

Termites are polymorphic with a strict caste system

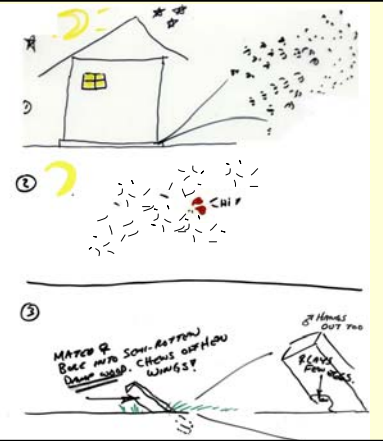
- winged and wingless reproductives
- sterile workers
- immature individuals, the nymphs



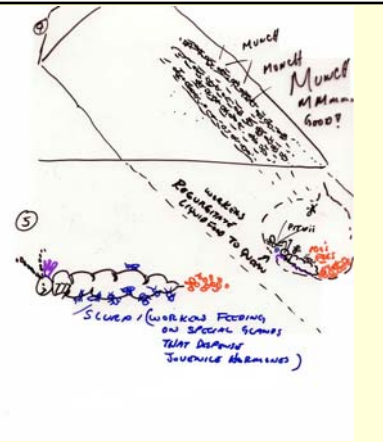
Termites have a well developed caste system



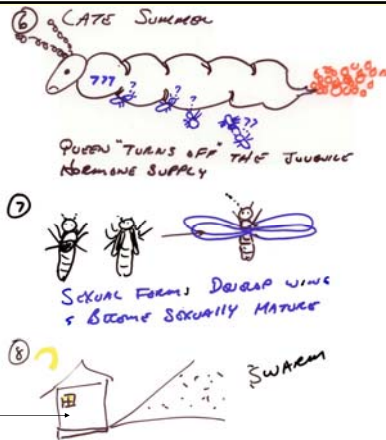
The Pacific dampwood termite. This termite swarm starts in mid August – late September.



Pacific dampwood termite continues to develop.



Pacific dampwood termite colonial development continues.

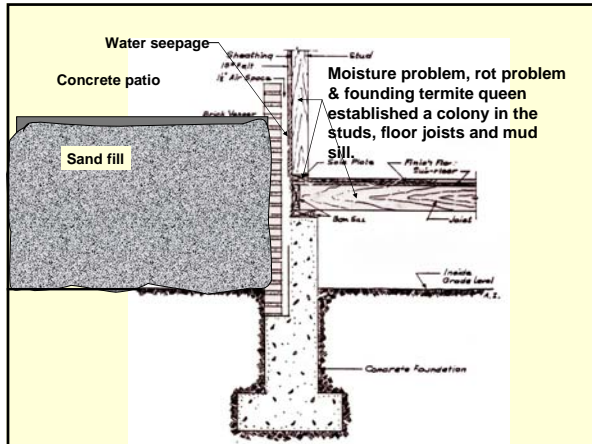


It's August again.

Look how the queen grows after she has founded the colony.



The dampwood termite is a major problem in the PNW: these termites infest wooden structures wherever there is a moisture problem. Even my own home!



Thoughts on management of the dampwood termite:

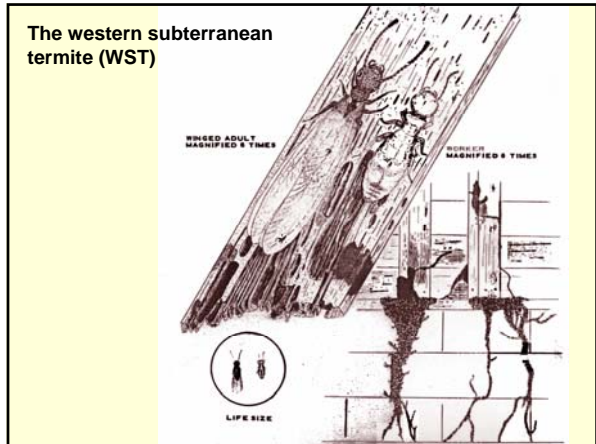
- Find the moisture problem!
- Solve the moisture problem – remove the cause.
- Remove all infested material and rebuild.
- If you buy a house inspect crawl spaces and around foundations for wood scraps; a special case when you buy a new home as contractors tend to leave pieces of lumber under the structures.

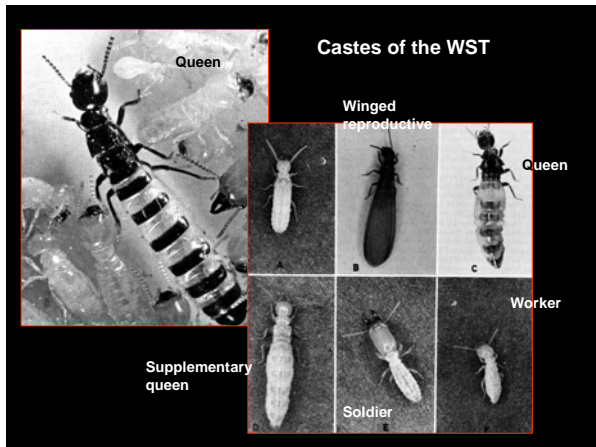
In the West we have the western subterranean termite: a huge pest.

Subterranean Termites, Their Prevention and Control in Buildings
 H. B. JOHNSON, VINCE E. BURKE, and RAYMOND H. DEAL¹
 INTRODUCTION

¹ Research entomologists, Southern Forest and Range Experiment Station, USDA Forest Service.

Head 'em!

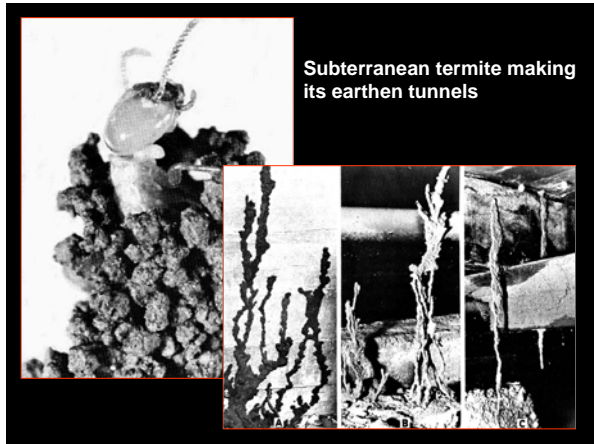




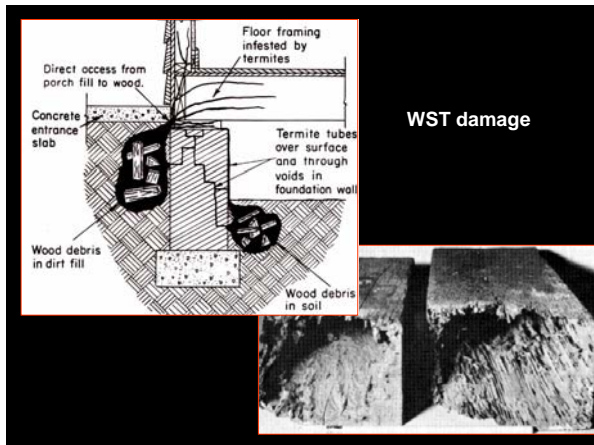
The western subterranean termite, *Reticulitermes hesperus*, is found from B.C. and south through Mexico.

Belongs to the family Rhinotermitidae and their life cycle is similar to the dampwood termites:

- In PNW their swarms occur in Sept.-Oct.
- The founding queen must locate buried wood in which to start her colony, generally partially buried wood.
- Although they need this secluded, moist subterranean environment to establish their nests, they can easily invade dry wood via their earthen tunnels.



Subterranean termite making its earthen tunnels



WST damage

Practices to avoid WST problems:

1. No wooden portions of buildings anywhere near the soil;
2. Use treated lumber in parts of buildings near the soil;
3. Have adequate ventilation under buildings – air vents every 12ft (City Code);
4. Remove all wood from under buildings
5. Pre-treat with insecticides and placing plastic barrier beneath concrete-slab foundations.

Here in the Puget Sound we have both the dampwood and western subterranean termites, how do you tell them apart?

Dampwood

Adults cream-colored & ca. 1" long

Workers about 3/4" long, buff colored

Galleries contain pellet-like frass

WST

Adults off-white and ca. 1/4" long

Workers about 1/8" long and whitish

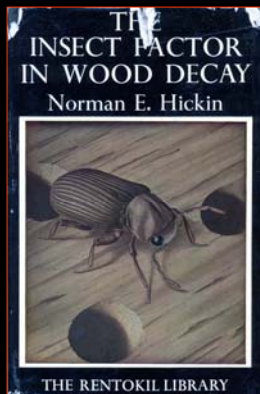
Workers plaster fecal matter all over walls of galleries: walls glisten.

Final words about these social insects: the Isoptera:

- They care for their eggs and young during the founding of the colony;
- The royal pair have a greatly expanded life span, often 15-20yrs;
- The parents are taken care of by their off springs;
- Control of the production and growth of individuals leading to formation of the different casts depends on the cocktail mixture of exudates the queen provides (called tropholaxis).

The powderpost beetles:

1. Anobiidae
2. Lyctidae
3. Bostrichidae



“ In 1914, Sir Frank Baines made a report on the condition of the timbers of Westminster Hall. Sir Frank, who was then the Royal Director of Works, H.M. Office of Works, pointed out the serious condition of the roof timber in this great Norman monument. Furthermore, in 1924, at a public meeting of the Royal Society of Friends of Insects, with Sir Aston Webb in the chair, he stated that the attack of the Death-Watch Beetle appeared to be so prevalent that there was probably hardly a medieval structure in this country which was not, or had not been infested by it at some time. Immediately following the Westminster Hall report, three-quarters of the Great Hall fell in due to the Death-Watch Beetle.”

“Then H. Maxwell Lefroy, Royal Professor of Entomology at the Imperial College of Science and Technology began an investigation on the cryptic habits of the Death-Watch Beetle in order to exterminate it etc. etc.”

Powder post beetles generally prefer dry wood in which to feed.

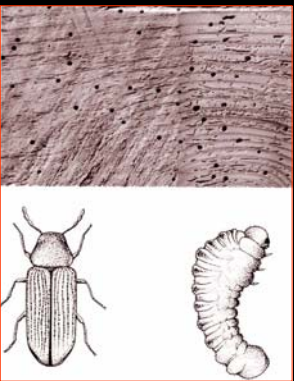
- Anobiidae feed in dry old wood of both conifers and hardwoods.
- The most common anobiid in the PNW is the Pacific Coast Powderpost beetle (a major problem of buildings in Sequim).
- The furniture beetle and the death watch beetle are both anobiids.
- Other anobiids are the drugstore beetles that feed on old cigarettes and cigars, pills, and stored grain.

The furniture beetle, *Anobium punctatum*, riddles old and new furniture.

Eggs placed in fissures or checks in the wood, usually at the interface of spring and summer wood.

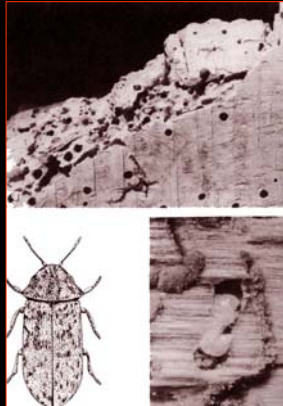
Larvae bore and feed; pupation occurs near the surface of the wood.

Adults re-infest.



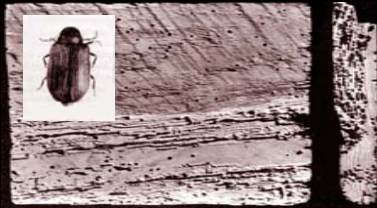
The death-watch beetle

- Although it will develop in coniferous wood, it prefers oak.
- Love old cathedrals, old oak furniture, old oak library furnishings, oaken chairs of retired people, and old oaken bedsteads.
- Make a rapping sound as they feed in the wood.
- Lay eggs directly in exposed vessels of old wood.



The Pacific powderpost beetle: *Hemicolus gibbicollis*

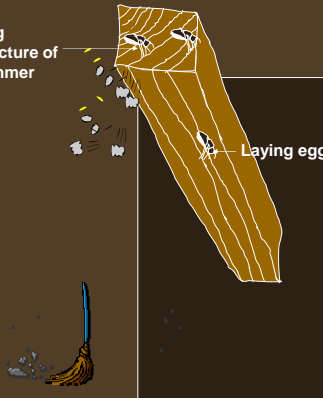
- The most damaging powderpost beetle from Alaska to California;
- Often seen infesting the under portions of buildings without basements – the Sequim problem!



Anobiids laying eggs at the juncture of spring and summer wood.

Laying eggs in cracks

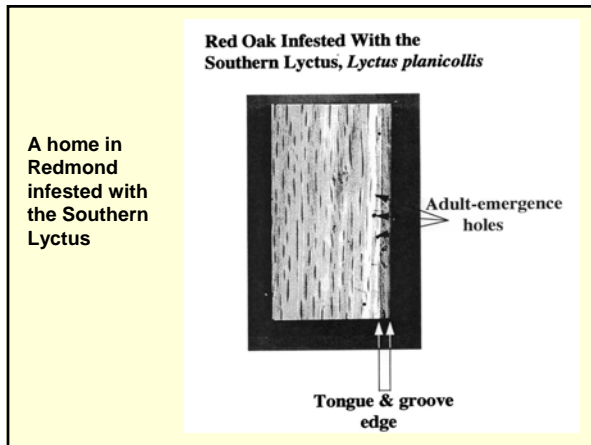
Fine powder

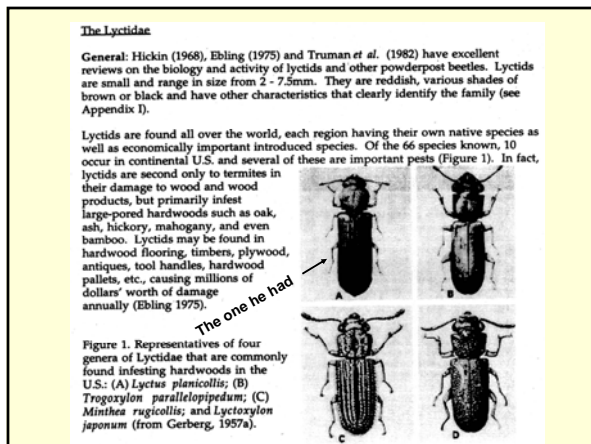


The Lyctidae: the most destructive powderpost beetle attacking wood products. They are mostly found in the South attacking all kinds of hardwood lumber: e.g. oak.

Through commerce their infestations are found all over North America, especially in hardwood lumber, oak flooring, decorative trim, tool handles and even bamboo. Behavior:

- eggs are laid in pores in the wood which open to the surface;
- larvae then render to powder the wood, but leave a thin surface veneer;
- pupate near the surface then adults emerge through circular holes – expelling powdered wood as they crawl out.





The bostrichids differ from lyctids and anobiids in that the adults bore into the wood preparing egg-tunnels instead of ovipositing in surface cracks and pores.

The larvae also bore their own tunnels so that tunnels of all sizes riddle the wood.

Like the other powderpost beetles, bostrichids can continue to breed in the same wood until its reduced to powder.

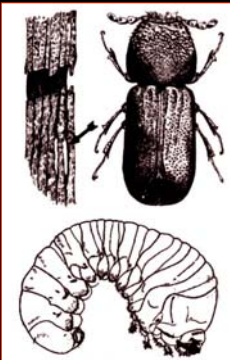


Leadcable borer, *Scobicia declivis*, are common along the Pacific Coast as they infest dead: eucalyptus, maple, elm, oak, and most any hardwood.

They can re-infest wooden hardwood materials, like flooring and expensive paneling.

Attracted to alcohol and are major pest in California as they infest wine casks.

Got its name by boring through the lead sheathing of power lines.



The bostrichid, *Stephanopachys substriatus*, occurs around the Northern Hemisphere, attacking dead: ponderosa pine, Jeffrey pine, and other pines. Also found in Douglas-fir and various true firs. It bores in the bark and outer sapwood, sometimes in air-dried lumber with pieces of bark still on them.





CONTROL OF POWDERPOST BEETLES

- ① COMMON SENSE!
Don't BUY ANTIQUE,
RATTAN FURNITURE, HARDWOOD
CARVINGS ETC.: WITH SMALL HILLS
& DUSTY WOOD BORINGS.
- ② YOUR HOUSE!

FUMIGANT.
(ONLY WAY)
- ③ PRECAUTION.
* LUMBER MILL/DEALER INSPECT
* STORAGE AREAS (PALLETS ETC.)
* FIRE WOOD!
