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Bark Beetles

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Description

Identification of bark beetles to species is difficult because the adults of the numerous species are very similar in appearance. There are over 600 species in this subfamily of beetles. Nearly all bark beetles are black or brown, and the adults all have cylindrical, hard-shelled bodies (Fig. 1). Adults measure between 0.125 to 0.33 inch (3-8 mm) long.

Order: Coleoptera, Family: Curculionidae, Subfamily: Scolytinae

Fig. 1. Five different species of bark beetles (Gerald J. Lenhard, Louisiana State Univ., Bugwood.org).

Habitat

Bark beetles attack trees that are weakened or dying due to stress factors such as drought; disease; smog; mechanical injury; ice or wind damage; alteration of the water table; or root damage due to nearby construction. They are also attracted to recently cut wood that still has bark attached to it.

Life Cycle

Adult bark beetles bore through the bark to the cambium layer of suitable host trees. The female excavates a tunnel between the bark and wood and lays her eggs in it. Upon hatching, each grub burrows away from the main tunnel and feeds on the live bark tissue (phloem) and outer cell layers of wood (xylem). The resulting network of egg and larval tunnels beneath the bark is called a gallery (Figure 2). The "shot hole" appearance of the outer bark in infested trees indicates that numerous beetles have matured, chewed exit holes, and flown off to find new breeding sites. Exit holes reflect the size of the adult beetles leaving the tree. Depending on the species, one to six generations may be produced each year.

Type of Damage

Bark beetles do not attack trees that have been dead for more than a season and have sufficiently dried to low moisture levels, although the wood may show evidence of prior infestation when the tree was still alive. Bark beetles also avoid recently cut wood if the bark has been removed.

Resin or pitch often oozes from the bark of pine trees at the site of initial beetle attacks. The resin flows freely, producing conspicuous pitch tubes that push attacking beetles back out of the bark (Figure 2). Some beetles become trapped in the fresh pitch and die. A healthy tree produces enough pitch to prevent successful attack by several beetles, but sometimes very large numbers of bark beetles are

able to overwhelm and kill healthy trees. This may happen to trees that are near heavily-infested breeding sites.

Another sign of bark beetle activity is the accumulation of boring dust on the bark and at the base of the tree (Figure 2). This sawdust-like material is pushed out of the entrance holes of the beetles as they excavate galleries.

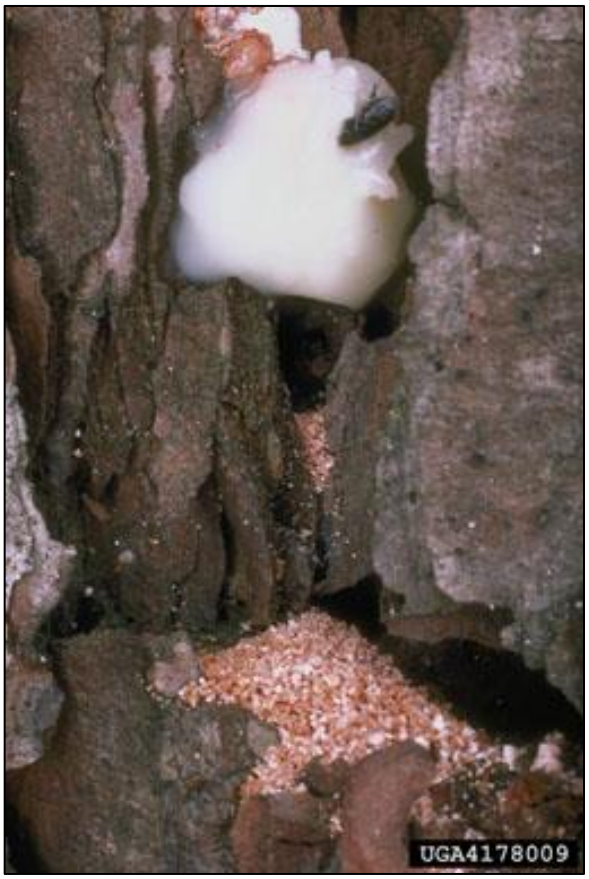

Fig. 2. A white pitch tube with a trapped southern pine beetle in it (top of photo) and an accumulated pile of reddish boring dust (bottom of photo) (Erich G. Vallery, USDA Forest Service SRS-4552, Bugwood.org).

Once a bark beetle is successfully established in a gallery, it emits a pheromone that attracts other beetles to infest the same tree. Once infested, it is unlikely that the tree will recover and survive. Beetles girdle the tree by making their galleries under the bark. Some beetles carry symbiotic fungi that grow in the beetle galleries. In some beetle-fungi associations, the fungi are pathogenic to the tree and hasten tree death in conjunction with beetle tunneling and feeding.

Not all bark beetles are tree-killing species. Some bark beetles attack individual twigs and branches that are dying from shading by surrounding trees or from other causes on an otherwise healthy tree. For example, some species breed only in recently dead or dying twigs, branches, and limbs of pines that still contain sufficient moisture to support the development of the beetle larvae. These bark beetles do not breed in healthy live branches, and thus are not a progressive destructive threat to the rest of the tree.

Common Bark Beetles

Several of the most common bark beetles found in Virginia are listed below, along with a few characteristics that may help identify them. However, there are many other species not included in this list that may be encountered in shade trees and wooded areas.

Ips Beetles. Bark beetles in the genus *Ips* are commonly called engraver beetles or simply Ips beetles. They can be distinguished from other bark beetles by the “scooped-out” appearance of the posterior section of their bodies and the presence of several spines along the edge of the excavation. Ips galleries, found in pine trees, generally form the shape of an H or a Y. Though capable of attacking the entire tree, Ips beetles are usually found in the crown.

Southern Pine Beetle. One of the smaller bark beetles, the southern pine beetle is barely 0.2 inch (5 mm) long. Outbreaks of southern pine beetle rapidly kill large areas of pine forests, usually after long droughts or periods of poor forest management. Southern pine beetles attack mainly the middle or upper part of the tree trunk. All ages and sizes of pine trees are potential hosts. Larval tunnels wind around the trunk in random, unorganized patterns. Healthy, vigorous trees and proper forest management practices reduce the likelihood of southern pine beetle outbreaks.

Conifer Bark Beetles. A wide variety of bark beetles attack pines and other conifers. In general, they attack trees in decline and leave long

meandering tunnels under the bark and small exit holes in the bark. Live trees removed from the ground and transplanted elsewhere are susceptible to beetle attacks. Trees transplanted in the spring or early summer may need an insecticide spray just after planting for protection.

Black Turpentine Beetle. This is a large bark beetle, about 0.3 inch (8 mm) long. It attacks pine trees at the base of the trunk and may also breed in fresh stumps. Black turpentine beetle larvae feed together and excavate large areas under the bark. A common characteristic of this beetle's attack is the presence of a glob of pitch, about 0.5 inch (13 mm) in diameter, where a beetle began boring into the bark. Sometimes there will be large numbers of white pitch globs seen on the dark bark.

Elm Bark Beetles. There are two species of bark beetles that attack elms. Both of them are capable of transmitting Dutch elm disease when they feed on healthy trees. The non-native European elm bark beetle feeds in the crotches of one- to three-year-old twigs; the native elm bark beetle feeds in the thick bark of trunks and limbs. Native elm bark beetles construct egg tunnels across the wood grain. Egg tunnels of the European elm bark beetle are parallel to the grain. Both make galleries and breed only in recently killed or dying elm wood three inches or larger in diameter.

Other common bark beetles include: the shothole borer which attacks fruit trees, wild cherry, serviceberry, and occasionally elm; the peach bark beetle found in stone fruits, mountain ash, elm, and mulberry; *Pityogenes* spp. and *Pityophthorus* spp. in pines; *Phloeosinus* spp. in cypress and junipers; the ash bark beetle in ash; the birch bark beetle in birch, beech, wild cherry, and red gum; and the hickory bark beetle in hickory.

Control Methods

The identification of bark beetles to species is usually unnecessary for making pest management decisions due to the overall similarities in bark beetle life cycles and the type of injury they cause. Trees should be scouted regularly for overall tree health and signs of initial bark beetle infestation. Unfortunately, trees almost never recover once they are infested with large numbers of bark beetles and any chemical control efforts applied after infestation are usually futile.

Prevention (Non-chemical)

Preventative measures against bark beetles include maintaining healthy, vigorous trees and eliminating beetle breeding sites. Recently dead or cut trees and limbs, slash, and tall stumps should always be promptly eliminated to avoid attracting egg-laying bark beetles. Debarking timber before storage will kill any beetles under the bark and make the green wood unattractive to any beetles seeking gallery sites. Firewood with attached bark should be stacked properly to facilitate air-drying and used promptly. Do not move firewood long distances as this may transport bark beetles and other destructive wood-boring insects into new areas.

Treatment (Chemical)

Apply residual insecticides to susceptible, but as yet uninfested trees, especially those under stress and therefore attractive to bark beetles. Trees near a known, active infestation can also be treated with residual insecticides. Treating infested timber before bark beetles emerge will kill the adults as they chew their exit holes and reduce the risk of fresh attacks on nearby trees.

Check the Horticultural and Forest Crops Pest Management Guide, Virginia Cooperative Extension publication 456-017, for current insecticide recommendations for bark beetles. Always read and follow the instructions on the pesticide label.

Revised

Olivia C. McCraw, June 26, 2014; Theresa A. Dellinger, February 14, 2020.

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