

Field Key to Beetles in Pines



Oklahoma Cooperative Extension Service • Division of Agricultural Sciences and Natural Resources

F-7164

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This key is designed to serve as a guide to identification of more typical adult inner-bark and wood-boring beetles attacking pine trees in Oklahoma. The key consists of two parts, one for adult insects and one for galleries made by the insects.

A ruler and a 10 to 15X hand lens will be very helpful in using this key. When possible use both adult and gallery keys. If the insect does not key out properly and proper identification is desired, place and adult in a small bottle containing 70 percent alcohol and mail to: Extension Entomology, Oklahoma State University, Stillwater. Please include information as to the type and amount of damage noted, host, date and locality.

Some insects found in association with pines cannot be identified with this key. These would include larvae, flat bugs, predacious insects and arthropods other than insects, such as mites and pseudoscorpions.

Survey Method

Check your trees periodically for damage. Remove the bark and look for adult beetles and their galleries; look for "pin-holes" and large holes in the wood. Healthy as well as damaged trees should be checked for pitch tubes and subsequent galleries. Beetle damage to pines can occur throughout the year with the heaviest damage occurring in the late summer and fall.

Description of Adults

Southern Pine Beetle. (*Dendroctonus frontalis*) This beetle is about $\frac{1}{8}$ -inch long. The posterior portions of the elytra are rounded as viewed from the top and side. A small notch may be seen on the front of the head with the 10 or 15X lens. The beetles have attacked pines of all sizes and can kill healthy trees. Pitch tubes may be found on the middle and lower trunk. This beetle makes "S" shaped galleries in the inner-back of the tree.

Black Turpentine Beetle. (*Dendroctonus terebrans*) The adult is $\frac{1}{4}$ to $\frac{1}{3}$ -inch long, dark brown or black. It is without a small notch on the front of the head; the abdomen is rounded. Pitch tubes are located on the lower trunks or stumps of pines with mechanical scars, or on trees occurring on poor drainage sites. The insect is more prevalent during dry periods. The pitch tubes are large, greater than $\frac{1}{2}$ inch in diameter. The galleries are ovate or "D" shaped (refer to . . . 2).

Ips Beetles. Three *Ips* species frequently attack the crown and trunks of saplings and mature pines which have been weakened by drouth, fire, hail, insects or other agents. Small pitch tubes ($\frac{1}{4}$ inch or less in diameter) can be found on branches and/or on trunks. Even though each species has a preference for a portion of the tree, they may overlap. The brownish-red beetles make "H" or "Y" shaped galleries.

Ips avulsus, the smallest *Ips* beetle, is $\frac{1}{8}$ th-inch long with 4 projections on the posterior of each elytron. With the invasion of this *Ips* beetle into the upper portion of the tree, other *Ips* species may invade.

Ips grandicollis is the medium-sized bark beetle which is about $\frac{3}{16}$ -inch long and has 5 projections on the posterior of each elytron. This species commonly invades the middle and upper trunk.

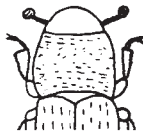
Ips calligraphus is about $\frac{1}{4}$ inch in length and has 6 projections on the posterior of each elytron. The beetle characteristically attacks the lower trunk.

Southern Pine Sawyer. (*Monochamus titillator*) The main distinguishing characteristics of this species are the size, color, and length of antennae. The grey-brown adult is $\frac{3}{4}$ to $1\frac{1}{4}$ -inches long. The antennae are longer than the body; they can be about 2 to 3 times the length of the body. The adult female cuts funnel-shaped pits in the bark surface and oviposits in the phloem. Larvae feeding beneath the bark at these points produce brownish frass and coarse-shredded wood. Circular pencil-size holes in the wood are signs that adults have emerged. The insect causes considerable degrading of lumber by tunneling through sapwood and heartwood of dead and dying pines or green logs.

Turpentine Borer. (*Buprestis apricans*) The adult is grayish-bronze with a metallic green cast. It is ap-

A Field Key to Common Adult Inner-Bark and Wood-Boring Beetles in Pines in Oklahoma

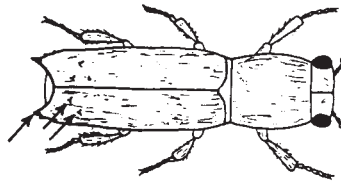
1. Head visible from above



2a. Size greater than 1/2 inch

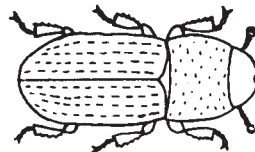
2b. Size less than 1/2 inch

3a (2b) Elytra elongate with spine-like projections posteriorly

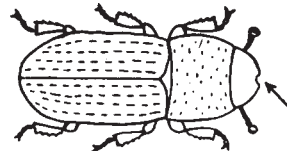


Ambrosia Beetles
Platypus spp.

3b (2b) Elytra not elongate, rounded posteriorly

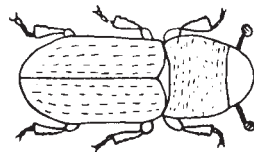


4 (3b) 1/8 to 3/16-inch long
Small notch on anterior of head



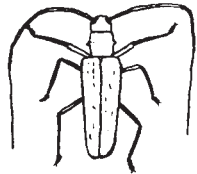
Southern Pine Beetle
Dendroctonus frontalis

4 (3b) 1/4 to 1/3-inch long



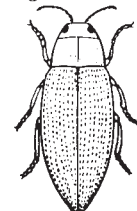
Black Turpentine Beetle
Dendroctonus terebrans

3 (2a). Antennae greater than length of body



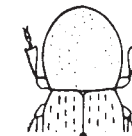
Southern Pine Borer
Monochamus titilluor

3 (2a) Antennae less than length of thorax



Turpentine Borer
Buprestis apricans

I. Head not visible from above



IIb Fore wings not concave posteriorly, spines lacking

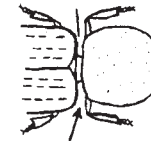


IIa. Fore wings concave and spined posteriorly



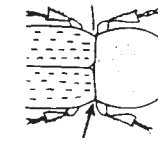
Ips Beetles

IIb Base of pronotum narrower than base of the fore wings



Bostrichid Beetles

III (IIb) Base of pronotum about equal to base of the fore wings



Ambrosia Beetle
Xyleborus spp.

III (IIa) 1/8-inch long
4 spines posteriorly on fore wings



Ips avulsus

(IIa) 3/16-inch long
5 spines posteriorly on fore wings



Ips grandicollis

III (IIa) 1/4-inch long
6 spines posteriorly on fore wings



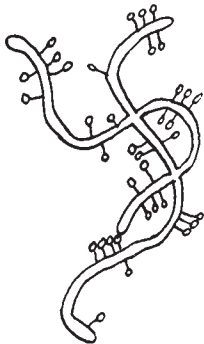
Ips calligraphus

Galleries

I. Between bark and wood
Bark Beetles

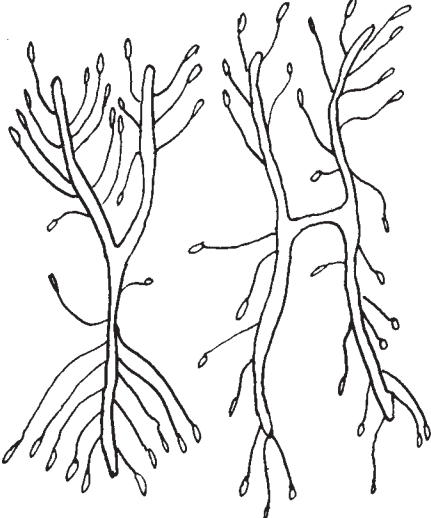
I. Within wood
Wood Borers

2 "S" shaped



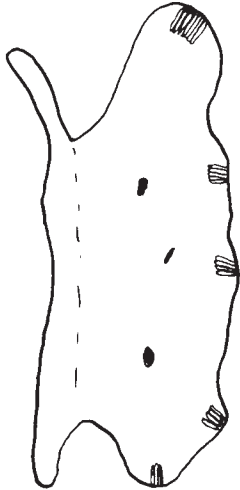
Southern Pine Beetles
Dendroctonus frontalis

2 "H" or "Y" shaped



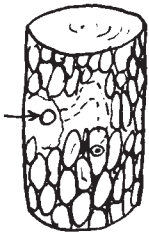
Ips Beetles

2 "D" shaped or oval shaped



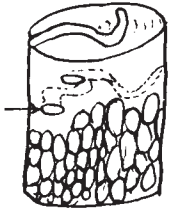
Black Turpentine Beetle
Dendroctonus terebrans

II. Exit hole 1/3 inch, round



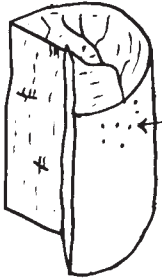
Southern Pine Sawyer
Monochamus titillator

II. Exit hole 1/3 inch, elliptical



Turpentine Borer
Buprestis apricans

III. Small "shot-holes"



Dark-stained tunnels
Ambrosia Beetles
Platypus spp., *Xyleborus* spp.

proximately 1 to 1¼-inches long. The antennae are shorter than the length of the thorax. Pines attacked may be fire-scarred or mechanically injured. Signs of this insect are elliptical emergence holes with tightly packed frass in the galleries. Generally these elliptical holes are found less than 6 feet from ground level.

Ambrosia Beetles. There are several genera of ambrosia or timber beetles found in pines and their hardwood associates. The *Platypus* spp., as described in the key are about ¼ inch in length with spine-like protuberances at the posterior of an elongate elytra. Adults attacking logs, lumber, and weakened trees can be recognized by fine white dust coming from "pin-holes". The gallery is described in the key. Other ambrosia beetles (*Xyleborus* spp.) look like *Ips* beetles but do not have the scooped-out, knobbed elytra.

Bostrichid Beetles These beetles are similar to the ambrosia beetles (*Xyleborus* spp.) but can be distinguished by the base of the pronotum being distinctly narrower than the base of the elytra, while the ambrosia beetle has the base of the pronotum about as wide as the base of the elytra. Refer to key to distinguish bostrichid from ambrosia beetles. Most generally one finds more bostrichids in hardwood than in pines.

Prevention of Infestation

Ornamental pines provided with adequate food and water can reduce or overcome beetle infestations.

A stand of pines is best protected by practicing good management. Good management would include thinning old, unhealthy and crowded trees; providing sanitation by preventing the build-up of large amounts of slash or beetle breeding habitats; avoiding mechanical damage to roots and trunks by logging and road building equipment; and prompt removal of felled logs and pulpwood. All trees which have been damaged by windstorm, lightning, fire, and or machinery should be salvaged immediately or felled and sprayed with lindane. When the beetles attack, controlling their numbers becomes paramount.

Control of Beetles

Control of the various bark and wood beetles varies, and identification of the insect becomes necessary. Trees under heavy attack generally have yel-

Pests	Control	Comments
Misc. Borers/Beetles of Pines	Lindane* 20 EC or 25 WP or Drusban 4E or 50 WP Mix per label directions.	Brush or spray trunk and lower branches to point of runoff.
Southern Pine Beetles <i>Ips</i> Beetles Southern Pine Sawyers	Lindane or Dursban 4E or 50 WP Mix per label directions.	Soak bark with a coarse spray.
Black Turpentine Beetle Turpentine Borer Ambrosia Beetles	Lindane 20 EC or 25 WP or Dursban 4E or 50 WP Mix per label directions.	Soak bark with a coarse spray.

*Do not apply spray to wet bark. The above chemical information is current with EPA registration at the time of printing. The user is responsible for determining that the intended use is consistent with the pesticide label.

lowish tops. If salvage is not possible, fell the trees and burn them, or peel and burn the bark, or spray with lindane. With high value trees (naval stores, seed trees, etc.) one might consider spraying the trunks for a particular intruder.

Insecticide Safety Precautions

Safety precautions should always be followed. Use only the chemicals suggested for a specific use at proper dosages. Proper application equipment should be used. After spraying, clean equipment thoroughly.

The applicator should change clothing and wash exposed areas repeatedly with generous amounts of soap and water. This procedure should be especially emphasized if a chemical is accidentally spilled or sprayed on a person.

Chemicals should be stored in locked cabinets preferably out of reach of children and pets. Application equipment and accessories should be stored out of reach of small children to prevent accidents. Before using any chemical, READ THE LABEL to make certain that proper application procedures and safety precautions are being carried out.

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