

## HOW TO DISTINGUISH ATTACKS BY THE BLACK TURPENTINE BEETLE AND *DIORYCTRIA AMATELLA* ON SOUTHERN PINES

Abstract.—Trunk attacks by the black turpentine beetle, *Dendroctonus terebrans* (Oliv.), and the larvae of *Dioryctria amatella* (Hulst) on the southern pines results in a copious flow of pitch. This external pitch mass or pitch tube exhibits characteristics that can be used as symptoms to distinguish between attacks by these two insects.

The black turpentine beetle, *Dendroctonus terebrans* (Oliv.), and larvae of the moth *Dioryctria amatella* (Hulst) commonly attack the trunks of southern pines (figures 1 and 2). Occasionally both species attack the same tree, and it is difficult to determine which species is present.

This Note presents distinguishing characteristics of external stem-attack symptoms that will enable foresters, timberland owners, and seed orchardists to determine which of the two insects is damaging their trees.

The feeding activity of both insects causes pitch to flow from the attack site of infested pines, and this exuded pitch soon assumes characteristic forms. The mass formed by the black turpentine beetle is generally in the form of a firm tube of pitch with a distinct hole running through the center. In contrast, the mass of pitch formed by *D. amatella* rarely has a distinct hole and is generally nothing more than an amorphous outflow of pitch sparsely infiltrated with pellets of reddish-brown frass (fig. 3).

There are several biological reasons for the differences in appearance of the pitch tubes caused by the two insects. Pitch tubes are formed by the black turpentine beetle during a relatively short period of time (2 weeks or less). The attacking beetles bore through the outer bark and into the succulent, white inner bark where the eggs are deposited. Once the female beetle has successfully established the egg gallery, no fresh gum or frass is pushed through the opening in the pitch tube. Thus, within a month after a pitch tube is completed, it begins to harden and take on a characteristic grayish or purple-gray color. The pitch tubes are most frequently found on pine trunks larger than 8 inches in diameter, and rarely occur higher than 10 feet above ground. In fact, the first beetle attacks are almost invariably found in the basal 18 inches of the tree trunk.

The pitch mass of *D. amatella* is produced by the larva while burrowing in and under the bark, and sometimes rather deeply into the wood. Because the larva is continually feeding in live tissue, it pushes fresh gum to the surface for longer periods of time; i.e., up to a month or more. The copious flow and accumulation of gum is usually most evident on fusiform rust (*Cronartium fusiforme* (A. and K.) Hedgc. & Hunt) stem and branch cankers which are infested repeatedly by succeeding generations of this moth. Sometimes the flow of gum from the feeding galleries is so great that it runs down the stem and accumulates at the base of the tree. The larvae also attack buds, shoots, and cones of longleaf, slash, loblolly pines, and probably most native southern yellow pines.

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Figure 1.—Heavy concentration of black turpentine beetle pitch tubes on the base of a slash pine.



Figure 2.—Pitch masses of *Dioryctria amatella* on the trunk of a young planted slash pine.



Figure 3.—At left, pitch tube of black turpentine beetle with a distinct hole running through the center. At right, irregularly shaped pitch mass of *D. amatella* lacks any distinct hole.

The following key may be used to distinguish the pitch masses formed as a result of each insect's activity:

## PITCH MASS CHARACTERISTICS

### Black Turpentine Beetle,

#### *Dendroctonus terebrans*

**1. Location.**—Usually in bark crevices at ground line and frequently hidden under gum cups on naval stores trees. Pitch tubes are rarely found at the edge of worked naval stores face. Attacks are common in large trees under drought stress and in logging areas where tree roots and trunks become damaged. First-attack pitch tubes usually are found in the basal 18 inches of the tree stem; as attacks continue, pitch tubes may appear up to 10 feet above ground.

**2. Size.**—Usually not larger than a half-dollar in diameter and quite compact and firm. If gum flow is prolific, it lasts only for several weeks.

**3. Color.**—When pitch tube is first formed, it may be yellowish white to pink; this is especially true where tree is pitching-out the attacking beetles. Normally the tube is a dark red or reddish brown because of the outer bark fragments mixed with pitch. About a month after the pitch tube is formed, the surface begins to take on a gray color. If pitch tube is white to yellow, it indicates that the attack was unsuccessful and no round reddish-brown frass pellets were mixed with the pitch.

**4. Texture.**—Very granular in appearance because of thorough mixing of pitch with boring dust and reddish-brown bark fragments when the beetle is boring through the bark and preparing egg galleries.

#### *Dioryctria amatella*

**1. Location.**—On actively worked naval stores trees (both slash and longleaf), *usually found along lateral edges of face*; occasionally found on the bark surface away from the face where it is most easily confused with black turpentine beetle. Pitch tubes most frequently seen on fusiform rust cankers on stems and branches of all sizes and ages. Also seen on mature cones of longleaf, slash, and loblolly pines at cone collection time. In newly planted seed orchards, where the insect is commonly a pest, pitch masses occur near the graft union and in the crotches between limbs and main stem.

**2. Size.**—Very irregular in shape and varies greatly in size. Flow of fresh gum may continue for months, causing large accumulations of pitch to run down the tree. May even accumulate in masses at base of small infested tree.

**3. Color.**—Usually yellow, white, or red-brown in color because of the copious flow of fresh gum lightly infiltrated with round frass pellets.

**4. Texture.**—Small bits of reddish-brown excrement scattered irregularly throughout the large mass of pitch. During the period of active tree growth, pitch is usually soft and readily flows over the bark surface.

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