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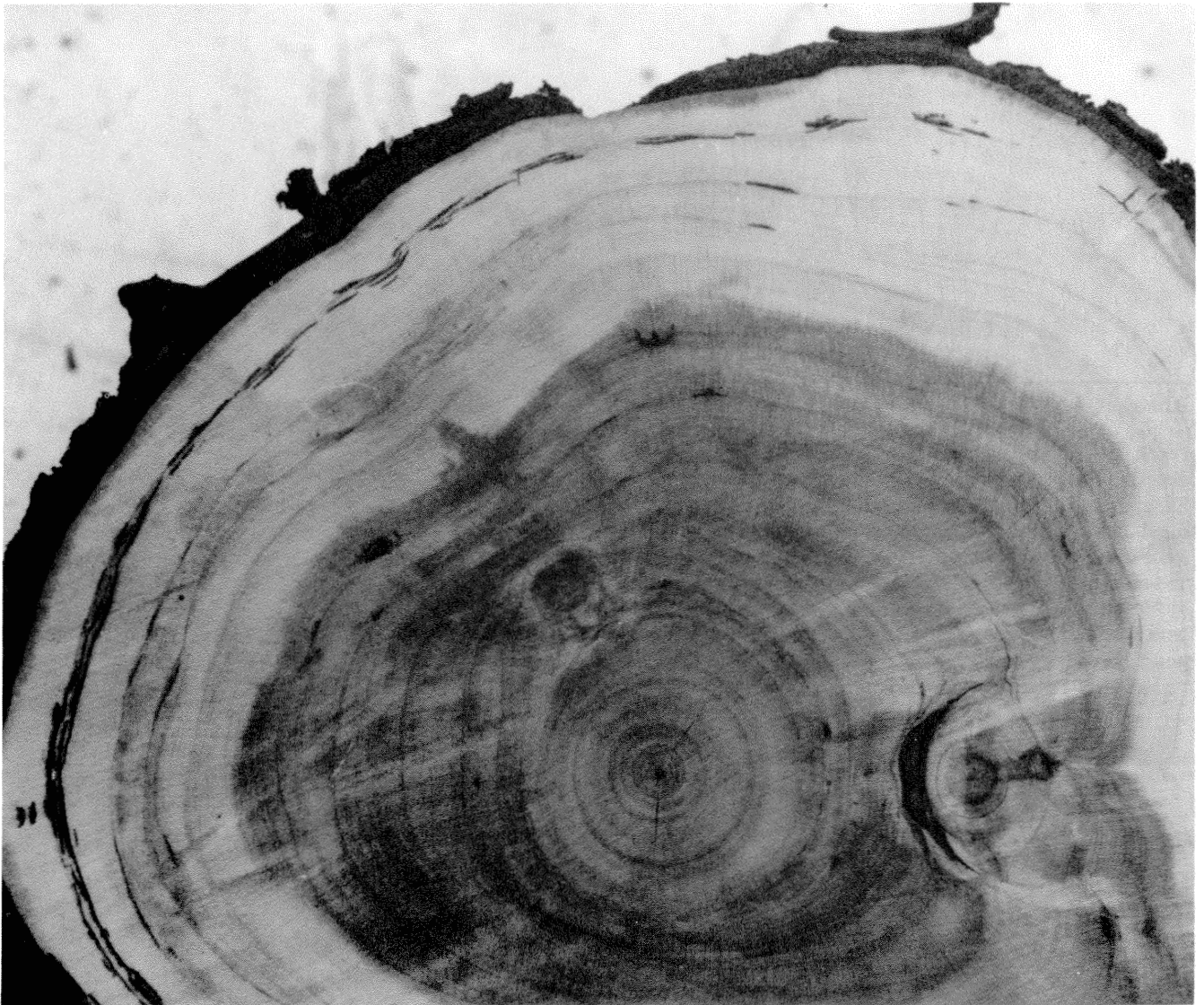
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Gum Spots in Black Cherry Caused by Natural Attacks of Peach Bark Beetle

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Abstract

Peach bark beetles, *Phloeotribus liminaris* (Harris), made abortive attacks on healthy black cherry, *Prunus serotina* Ehrh., trees. The beetle attacks caused five types of gum spots in the wood and a gummy exudate on the bark. The most extensive and common types of gum spot were single and multiple rows of interray gum spots that encircled the lower 3 m of the tree. Three to four attacks per 6.5 cm² of bark surface caused enough gum flow to produce a continuous ring of gum spot in the wood.

The peach bark beetle, *Phloeotribus liminaris* (Harris), a native insect, was first recognized as a pest of peach trees in 1850. For the next 65 years, it was a serious pest in peach and cherry orchards in Ohio, New York, and Ontario, Canada (Brooks 1916). Baker (1972) reported that it attacks elm, mulberry, wild cherry, wild plum, and mountain ash. Peach bark beetles have been found in New Hampshire, New York, Pennsylvania, Maryland, Virginia, West Virginia, North Carolina, Arkansas, Ohio, and Michigan and probably occur throughout the range of *Prunus*.

Gossard (1913) reported that a wild cherry tree 22.9 m tall and 35.56 cm in diameter was killed by peach bark beetles. Gossard also cited that the peach bark beetle and the shot-hole borer, *Scolytus rugulosus* (Ratz.), cause gummosis in *Prunus* in Ohio. He stated that although both bark beetles are more commonly associated with weakened and dead trees, it was not unusual for them to attack healthy trees. Attacks on healthy trees were usually unsuccessful and the beetles were sometimes found in balls of gum that were abundant on attacked trees. However, Gossard made no mention of gum spots in the wood. Craighead (1950) also reviewed the activities of the peach bark beetle but did not mention gum spots in wood.

In 1953, near Parsons, West Virginia, C. K. Dorsey observed black cherry trees that produced large quantities of gum (Kulman 1964). The gum was so abundant that it flowed from the trees and accumulated on the ground around the tree trunks. In 1958, Kulman (1964) found a continuous ring of gum spots in the 1954 and 1955 wood of these trees. He suspected that the gum exudate on the surface of the trees and the associated gum spots in the wood were due to hibernating galleries constructed by peach bark beetles.

Baker (1972) stated that *P. liminaris* usually attacks only weakened species of *Prunus* and, therefore, is normally confined to suppressed trees and shaded branches. Schultz and Allen (1977) found that *P. liminaris* attacked and killed black cherry trees after 2 to 3 years of defoliation by the cherry scallop shell moth, *Hydria prunivorata* (Ferguson). However, they did not mention abortive attacks on trees that did not die or gum spots associated with abortive attacks.

This paper is a report on the abortive attacks by peach bark beetles on apparently healthy black cherry trees and shows the types of gum spots in the wood that result from such attacks.

Materials and Methods

During the spring of 1979, several cords of black cherry, *Prunus serotina* Ehrh., wood infested with peach bark beetles, *P. liminaris*, were piled near a plantation of black cherry trees. The trees were 20 years old, 15 to 25 cm in diameter, 7 to 9 m tall, and apparently healthy (Fig. 1). In the early summer of 1979, adult peach bark beetles emerged from the infested wood and made abortive attacks on the plantation-grown trees.

Figure 1.—Healthy black cherry, *Prunus serotina*, attacked by peach bark beetles, *Phloeotribus liminaris*.



The number of beetle attacks and the extent of exudation at the attack sites were measured. In July 1980, two trees were felled and several cross sections 5 to 30 cm thick were taken from the attack areas for a study of the internal defects caused by beetle attacks.

After the cross sections were air dried for 2 weeks, portions containing gum spots were sanded to a smooth surface. The gum spots were examined under a stereozoom binocular microscope and grouped into definable types, and photomicrographs were made of each type of gum spot. Some cross sections were split tangentially and radially and each type of defect was classified, measured, and photographed.

Results and Discussion

Trees nearest the source of emerging beetles sustained the greatest number of attacks. Beetle attacks were concentrated on the basal 20 to 25 cm of the trees where the bark was

roughest (Fig. 2). The attacks lasted for about 3 weeks, and some sections sustained up to 10 attacks per 6.4 cm².

Trees exuded gum at the attack sites when the beetles reached the cambium and then the beetles were either "pitched out" or killed by the following gum and rarely reached the xylem. Trees continued to exude gum at the attack sites throughout the summer, and balls of gum as large as 25 mm in diameter were often formed at individual attack sites (Fig. 3). When attacks were numerous, the gum flowed down the boles and accumulated 5 to 10 cm deep around the base of the trees. The gum dried and hardened during the winter and did not continue to flow the following spring. However, the dried gum was present on the surface of the bark the following summer.

Several types of gum spots were present on transverse sections and two types were present on tangential sections of trees felled in July 1980. The most extensive type of gum

Figure 2.—Peach bark beetle, *Phloeotribus liminaris*, attacks on boles of black cherry, *Prunus serotina*.



Figure 3.—Black cherry, *Prunus serotina*, produces gum at peach bark beetle, *Phloeotribus liminaris*, attack sites.



spot was single and multiple rows of interray gum spots that encircled the tree (Fig. 4). The rings of gum were often 5 mm wide and extended 2.4 to 3 m on the tangential surface from the highest point of mass attack to the base of the tree.

Figure 4.—Multiple rows of interray gum spots that encircle the tree.



Three to four attacks per 6.5 cm² of bark surface were considered mass attacks, and this density caused enough gum to soak the bark. Single attacks caused four types of gum spots on the transverse section: (1) T-shaped spot (Fig. 5),

Figure 5.—T-shaped gum spot on transverse section.



(2) T-shaped spot with bands of interray gum spots (Fig. 6), (3) round to oblong gum spot (Fig. 7), and (4) multiple rows of gum (Fig. 8). Streaks of gum 5 mm wide and 80 mm long (Fig. 9) on the tangential section were commonly associated with the gum spots on the transverse section. On the radial surface, gum spots were 2 to 5 mm wide.

The attacks were abortive breeding attacks because they occurred during the height of beetle emergence. Also, no beetles were observed overwintering under the bark, and

there was no gum flow the following spring from the construction of hibernating adults.

Abortive attacks by peach bark beetles are important in the management of quality black cherry. Peach bark beetles may build up in large numbers in tree tops after a timber harvest and emerging progeny may make abortive attacks on the residual crop trees, causing permanent gum spots in the boles—the most valuable part of the tree.

Figure 6.—T-shaped gum spot with bands of interray gum spots.



Figure 7.—Round to oblong gum spot.

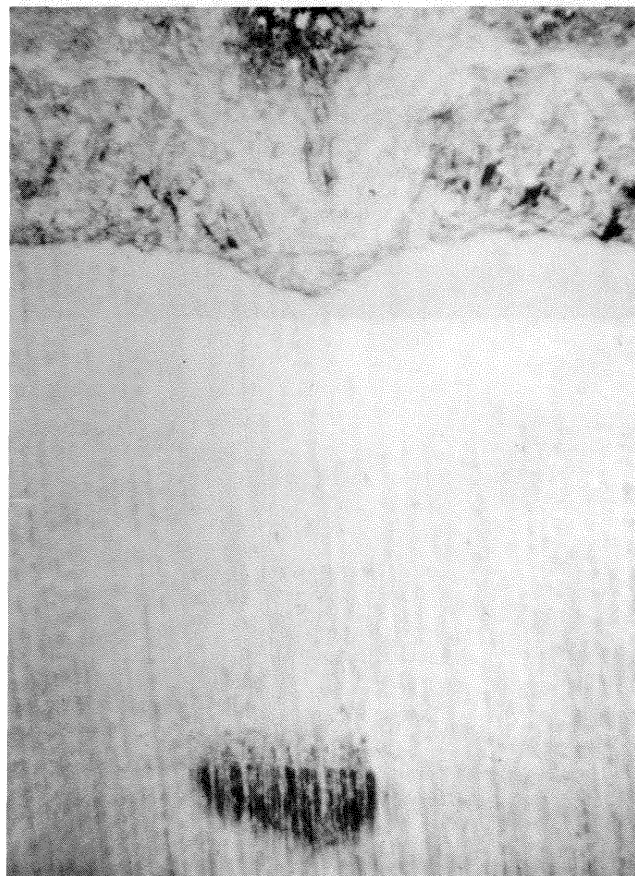


Figure 8.—Multiple rows of interray gum spots.

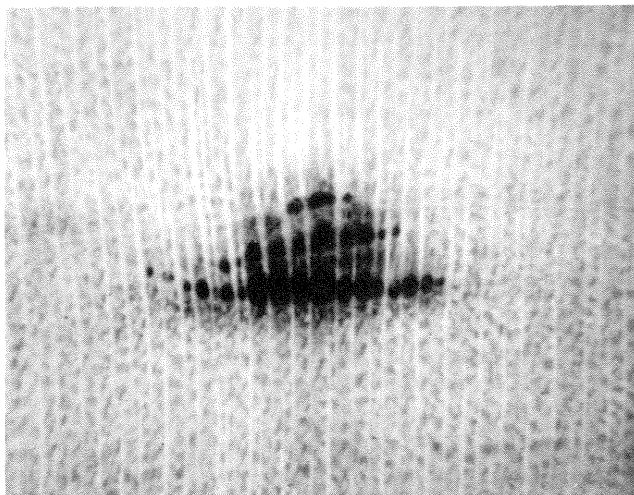
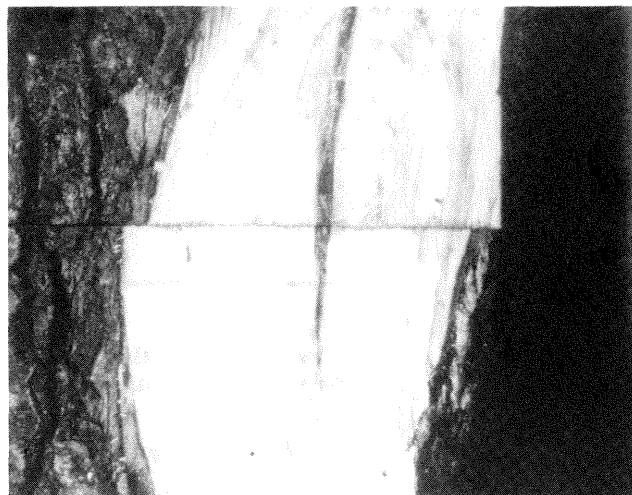


Figure 9.—Vertical streak of discoloration in the xylem at attack site.



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