

Hypoxylon Canker

Uncommon but locally important canker of aspen

Pathogen—Hypoxylon canker is caused by the fungus *Entoleuca (Hypoxylon) mammatum*.

Hosts—Hypoxylon canker occurs on trembling aspen and a few other aspens. It occurs over most of the range of trembling aspen in North America and also in Europe.

Signs and Symptoms—Stem cankers are often centered on dead branches, from which they commonly enter the stem. Young cankers, and edges of older cankers, are yellowish orange to orange-brown with an irregular margin. In recently killed portions of a canker, black and cream mottling may be found in the inner bark, cambium, and outer sapwood. In a year or two, the bark begins to blister and the periderm (the thin outer layer of bark) falls in patches, giving the canker a mottled or salt-and-pepper appearance from a distance (fig. 1). Eventually, most of the outer layer falls off, leaving the blackened inner bark on the surface.

Patches of tiny, gray pillars, like short, coarse hairs, are revealed where the periderm falls off. They can often be found earlier by peeling back loose, blistering periderm. The sexual stage will eventually be present in slightly older parts of the canker. It is composed of raised stromata that are initially gray and become black when mature, are about 1/8-1/2 inch (3-13 mm) in diameter, and each has several to 30, pimple-like, embedded perithecia (figs. 2-3). Small, white mycelial fans develop under the bark just behind the advancing edge of the canker.

Disease Cycle—The infection court is uncertain, but it appears that dying year-old twigs and small wounds can be infected. Various insects, including the poplar borer and the aspen tree hopper, make wounds that can also serve as infection courts.

Airborne spores that land on the infection court germinate during moist weather and grow into living bark. Two years may elapse before symptoms develop. In the year after a visible canker begins to form, the pillars are formed. The pillars grow up to blister the periderm, which flakes off. This exposes the spores that are produced all over the surfaces of the pillars. These spores are not infectious; they function only in fertilizing other cankers.

Stromata, containing the perithecia, are produced in the following year. Spores are forcibly ejected from tiny holes at the tips of the perithecia and are wind-dispersed. Additional cycles of pillar and stromata occur each year until the tree is killed and the fungus dies soon after.

Impact—Hypoxylon canker is widespread geographically, but is the least common of the five major cankers of aspen in Colorado and, presumably, in the rest of the southern Rocky Mountains. East of the Great Plains, however, it is often the most destructive disease of aspen. Even in the southern Rocky Mountains, localized areas may suffer serious mortality from this disease. Trees of all sizes may be attacked. Damage is most severe in open, widely spaced stands and near stand edges or openings. There is some indication that good aspen sites with deep soils and adequate moisture have higher levels of Hypoxylon canker than poor sites with dry, shallow soils, but this has not been verified. Mortality may result from girdling or from snapping due to wood decay beneath the canker.



Figure 1. Hypoxylon canker killing an aspen. Note the mottled, salt-and-pepper appearance of the upper, younger portion of the canker where outer bark is missing in patches. Photo: Jim Worrall, USDA Forest Service.



Figure 2. A large stroma of Hypoxylon canker with multiple perithecia. Photo: Jim Worrall, USDA Forest Service.

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Management—The canker is favored by stand openings and stands of low density, so maintaining continuous aspen cover should reduce infection. Susceptibility to the disease varies clonally, so consider avoiding further management of heavily infected stands.

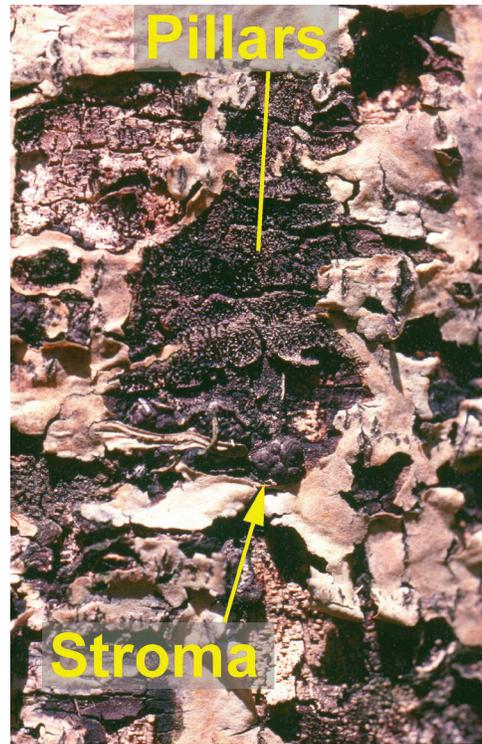


Figure 3. Conidial pillars and stromata of Hypoxyylon canker. Generally stromata are produced each year where pillars were produced the year before. *Photo: Jim Worrall, USDA Forest Service.*

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1. Hinds, T.E. 1964. Distribution of aspen cankers in Colorado. *Plant Disease Reporter* 48(8):610-614.
 2. Juzwik, J.; Nishijima, W.T.; Hinds, T.E. 1978. Survey of aspen cankers in Colorado. *Plant Disease Reporter* 62(10):906-910.
 3. Schipper, A.L.; Anderson, R.L. 1976. How to identify Hypoxyylon canker of aspen. *How To Leaflet*. St. Paul, MN: U.S. Department of Agriculture, Forest Service, North Central Forest Experiment Station. 4 p.
 4. Sinclair, W.A.; Lyon, H.H. 2005. *Diseases of trees and shrubs*. 2nd ed. Ithaca, NY: Cornell University Press. 659 p.