

8. Oak Leaf Blister

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Oaks, our most abundant hardwood genus, grow naturally in the eastern and southern Great Plains. They are planted frequently in rural and urban environments as shade trees, and are occasionally used in windbreaks in the northern Great Plains. Oak leaf blister, caused by *Taphrina caerulescens*, is one of the most common leaf diseases of oak.

Hosts and Distribution

Over 90 species of *Taphrina* are recognized; they cause diseases on various hosts. Some of the more widely recognized diseases include peach leaf curl (peach), plum pockets (plum), and leaf blisters (cherry, maple, elm, alder, oak).

Oak leaf blister is a major leaf disease of oaks in the southern United States. Oaks in the red and black subgenus are most susceptible to *T. caerulescens*, but all species of oak are susceptible.

Symptoms and Signs

This disease may go unnoticed until a large number of leaves are severely infected or begin to fall. The in-

itial symptom is a slight yellowing of infected leaf tissue, followed by formation of circular, raised blisters on the leaves (fig. 8-1). Blisters form when infected cells are stimulated to enlarge, while surrounding noninfected cells remain rigid. Blisters are usually less than 1 inch in diameter, and the lower surface will appear gray as the fungus develops in the leaf tissue.

The upper surface of the leaf blister remains light green for several weeks before dead tissue turns brown. Multiple infections cause a single leaf to become distorted (fig. 8-2). Premature defoliation may occur in the early fall. The fungus survives, presumably as conidia, on bud scales and in bark crevasses.

Disease Cycle

No fruiting structure is formed by *T. caerulescens*. Leaves are infected in early spring by conidia formed from ascospores during the previous season. Mycelium ramifies through the leaf tissue intercellularly and becomes massed just below the cuticle, where it eventually fragments into thick-walled binucleate cells. The upper portion of these cells becomes an ascus and eight ascospores are formed. As the asci form, pressure is ex-

Figure 8-1. Distorted oak leaves showing mild symptoms caused by *Taphrina caerulescens*.



erted on the cuticle, and the asci eventually break through to form a compact layer on the epidermis of the host (fig. 8-3). Ascospores bud in the ascus to produce conidia or are released intact from the ascus. Released ascospores then bud to form conidia. The conidia reside in bud scales and in bark crevasses, and spread to susceptible leaf tissue by rain where they produce germ tubes that infect leaves the following spring as the leaf buds begin to develop.

Damage

Heavy infections occur following cool, wet springs and may result in 50 to 85 percent defoliation of affected trees by midsummer. Defoliation can reduce growth and, if repeated over a period of years, may weaken the tree so that it is susceptible to attack by other organisms.

Control

Chemical control of oak leaf blister is not normally recommended for forest or shade trees. The disease may be unsightly and cause much anguish to homeowners, but vigorous trees are not severely affected. Particularly valuable trees may warrant treatment with fungicide, which must be applied as dormant spray to be effective. Fungicides are not effective after leaves begin to develop because infection has already occurred. Collecting and disposing of infected leaves will remove some inoculum. Maintenance of trees in healthy condition by fertilization, watering, pruning, and insect control will reduce the effect of this disease.

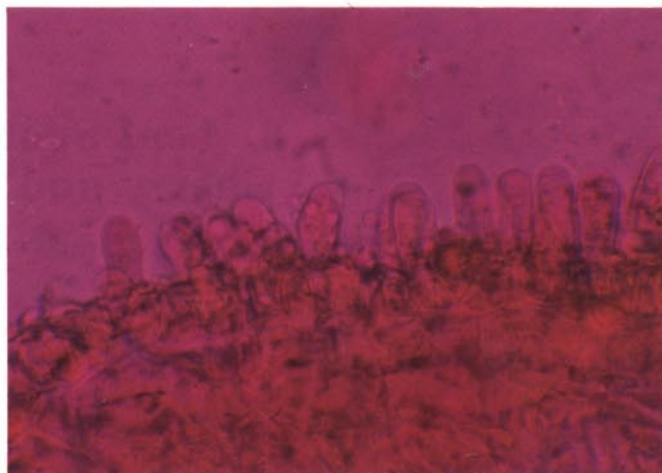


Figure 8-3. Cross section of a leaf blister showing a compacted layer of asci of *T. caerulea* on the upper surface of a leaf.

Selected References

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- Mix, A. J. A monograph of the genus *Taphrina*. University of Kansas Science Bulletin. 33: 3-167; 1949.
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Figure 8-2. Blistered and distorted leaves of bur oak caused by *T. caerulea*.

