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# Eutypella Canker of Maple

by

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The Eutypella canker of maple is found both in the forest and on ornamental trees. On the latter the aesthetic aspect is most affected because the disease causes a malformation of the trunk. In forests, the loss of logs from the base of trees destined for the saw-log or plywood industry, virtually annihilates the economic value of afflicted trees.

The name of this disease is very descriptive for it includes part of the name of the fungus causing the disease, (*Eutypella parasitica*, Davidson and Lorenz), and the principal symptom visible on the

infected tree (canker). This disease was reported in the literature for the first time in 1937, when it was observed on sugar and red maples in northern Minnesota and Wisconsin. The following year Davidson and Lorenz demonstrated that *E. parasitica* was the pathogenic agent; they published a good description of the cankers it caused, and an account of the distribution and prevalence of the disease in northern United States. This disease was reported for the first time in Québec in 1941. Several subsequent mentions indicate its more or less constant presence in the hardwood forests of Québec and Eastern Canada.

## HOSTS

Most maple species are susceptible to this disease. The sugar maple, our most common maple, is the most consistently affected. Eutypella cankers are often reported on red maple and occasionally on Norway, silver, black and Manitoba maples.

Cover photo:

Typical canker on a sugar maple in the forest.

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## SYMPTOMS

The predominant symptom of this disease is a canker, generally located on the tree trunk and composed of two parts: a relatively well defined area of fungus-killed bark and cambium, and a callus or bulge encircling this dead bark. This bulge can be very pronounced, as in the majority of cases involving sugar maple, or appear merely as a regular swelling around the dead bark, as is often the case with red maple. The canker is always elongated and may be on one side of the trunk or may almost girdle it. Other typical symptoms of this disease are: dead bark that is adhering to wood over the entire canker, a scar, or the stub of a dead branch toward the centre of the canker (80% of the cases), and fungal fructifications in the form of sparse or somewhat clustered black "charred" spots from which protrude the necks of several perithecia, 1 to 5 or 6 mm long. Occasionally, in the middle of the canker there is a white fleshy fructification, half covered by green moss. This is usually *Fomes connatus*, a decay fungus, which has penetrated the tree through this canker.

*Eutypella* canker of maple can be positively identified by removing pieces of bark at the upper or lower end of the canker on the margin between healthy and infected bark. Almost always, this exposes a cream or pale beige mycelial fan of the fungus, of variable size, and giving the distinct impression of growing from the canker towards the healthy parts of the tree. The size of this fan varies according to fungus development; the time required to locate it varies considerably, however identification takes but a few minutes, since few cankers resemble it, particularly on sugar maple.



a



b

Characteristic symptoms of a *Eutypella* canker:

- (a) dead bark still attached to the tree,
- (b) mycelial fans under the bark at the ends of the canker.



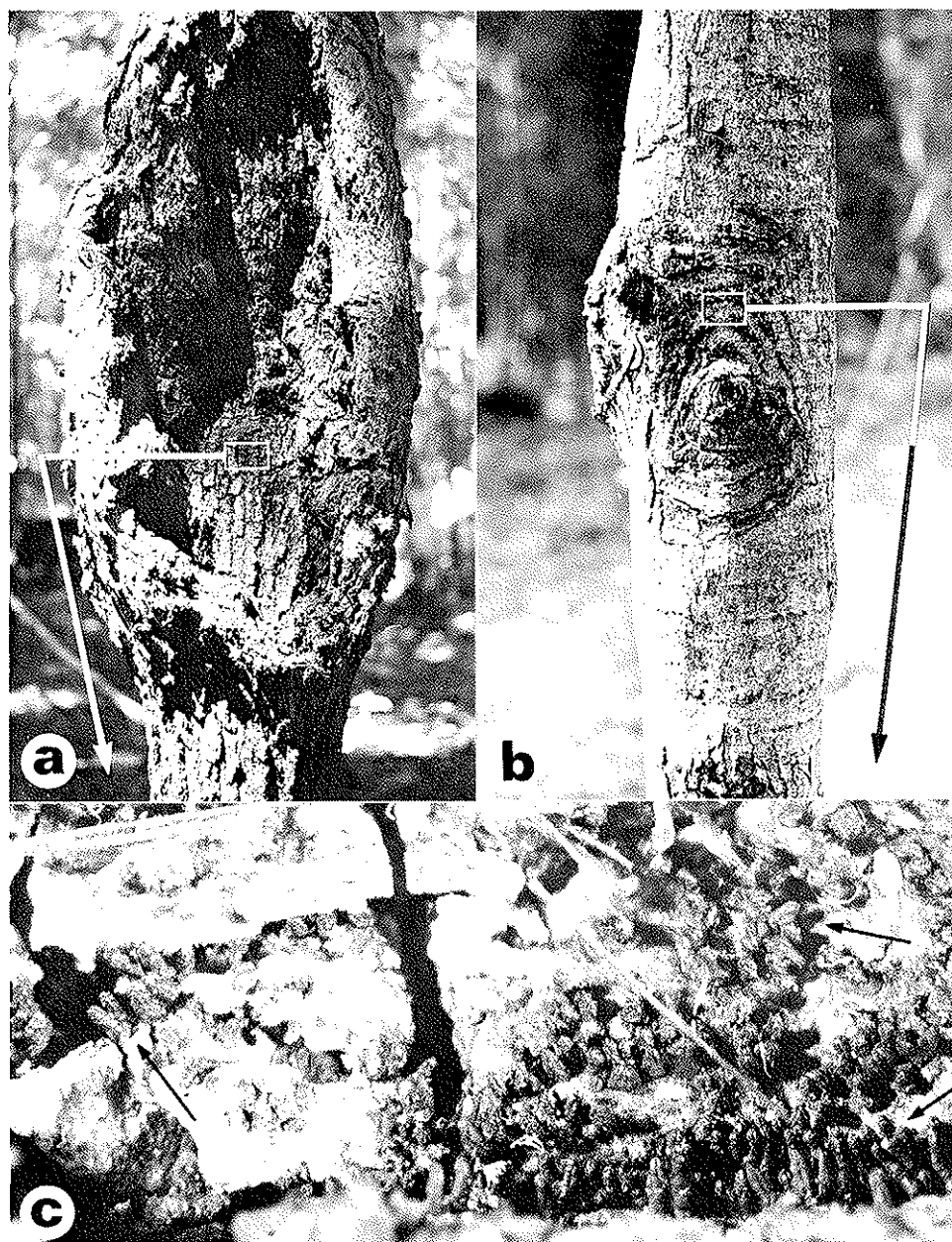
Close-up of mycelial fans growing under the bark at the upper end of a canker.

## INFECTION AND DEVELOPMENT

The *Eutypella parasitica* fungus cannot penetrate the outer layers of bark and therefore always need exposed wood to infect a tree. It usually enters (in nearly 80% of the cases) by a scar or stub of a branch broken off near the trunk, or by a wound exposing the xylem. The sources of infection are spores (reproductive cells), produced in fructifications present on old cankers and released during a rainfall. In normal conditions, wind cannot transport spores more than a few dozen metres. Spores landing on a medium favourable to their development, germinate rapidly and produce a mycelium which develops in the inner bark, at the cambium level, and possibly into the wood. It is this layer of mycelium under the bark which grows 1 cm or more per year, and which is mainly visible at the top and bottom of the canker,

that holds the dead bark to the trunk. Fungal fructifications will probably appear on the surface of this dead bark five or six years later.

Young maples are generally most susceptible to infection, probably because there are branches on their trunks, they have relatively thin bark, and often also because of the high density of inoculum (spores) present, originating from old cankers on large trees in the stand. Recent cankers (therefore without fungal fructifications) are rarely observed on trees of more than 12 cm in diameter. The smaller the diameter, the greater the chances that the fungus will girdle the trunk rapidly, killing the tree. The tree reacts to the fungus by producing a callus or bulge around the infected part during the season of rapid growth. It is this defensive reaction that produces this characteristic form of canker.



Dead bark still adhering to the wood over the entire canker, and the presence of a scar or stub of a dead branch toward the centre of the canker are characteristic symptoms: (a) sugar maple (b) red maple (c) fungal fructifications on dead bark (5X) and located in (a) and (b).

## DISTRIBUTION AND IMPORTANCE

This disease is found in the northern part of the natural range of sugar maple particularly in Ontario, Québec, and in eastern and central United States especially in those states close to the Canadian border.

Of the sugar maples surveyed in New York State, approximately 2.5% were cankered with up to 11.5% in certain stands. In the States of Wisconsin and Michigan the average was 2.8%, ranging from 0.9 to 6.6%. In one case in Ontario 40% of the maples in a stand were infected. In Québec the first mention in the survey of diseases of hardwood trees placed the frequency of this disease among maples at between 3 and 8%. A recent report gives frequencies of infection from 2 to 28% in Québec maple groves.

The significance of damage caused by this disease varies according to the desired use of the individual trees or of the forest as a whole. There is a high mortality attributable to the fungus in trees of 10 cm d.b.h. or less. As 90% of the cankers are less than 3.5 m from the ground, the value of the first log of an affected tree, destined for plywood or sawing, is greatly reduced, if not a total loss. The canker is also an infection court for decay and renders the tree very susceptible to wind breakage. Cankered trees considerably reduce the potential production of a stand by occupying space which normally could produce other trees of greater value. An old canker left in a stand is also a major source of inoculum and this may result in a high incidence of infection in new growth. Lastly, an enormous canker on a maple in front of one's house is not aesthetic, renders the tree more susceptible to wind breakage, and greatly reduces its lifespan because of decay which develops in its trunk.



The canker is an infection court for decay in the tree, rendering it very susceptible to wind breakage.

## METHODS OF CONTROLLING THE DISEASE

There are two methods of controlling this disease. The first consists of decreasing the number of cankers in the forest. Non-cankered trees are selected for crop trees; sick trees are cut releasing growing space for healthy trees and decreasing the quantity of inoculum. If possible, cankered trees should be removed from the forest and destroyed or used as firewood. A stand with several large trees with old cankers generally presents a much higher incidence of disease than a stand without such sources of inoculum.

A second method, applicable in a small private forest or on ornamental trees, consists in pruning branches 2.5 cm and less in diameter. These pruning wounds heal quickly, and prevent later breakage of branches at the trunk which leave large scars or stubs of branches which are also infection courts for the fungus. A recent infection on an ornamental tree can probably be eradicated by removing, with a disinfected knife, all the infected bark and 2 to 3 cm of healthy bark around the infection, completely scraping off the mycelial fan which may already be present, and then covering the entire wound with a fungicide and a coating of tree dressing.

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### **WARNING**

All pesticides are toxic substances that can be absorbed through the skin or by the respiratory system. For this reason, before using a pesticide it is important to carefully read and follow the manufacturer's instructions. Usually, the product is to be applied in calm weather. If, by accident, pesticide comes into contact with the skin, the affected areas must be immediately washed with soap and water. Pesticides must be stored out of reach of children and animals in a cool and well-ventilated space.

For additional information, please contact:

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