# Phomopsis twig die-back of some woody interior ornamentals in Alberta

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Many plants of *Ficus benjamina* used for interior landscaping in Edmonton, Alberta showed a twig die-back disease. The causal agent of this disease was identified as *Phomopsis cinerescens*. *F. nitida* and *Podocarpus macrophyllus* were recognized as new hosts for this pathogen.

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De nombreux plants de *Ficus benjamina*, utilisés pour la décoration intérieure à Edmonton, Alberta, ont montré des symptômes du dépérissement des rameaux. Le pathogène causant cette maladie a été identifié comme étant *Phomopsis cinerescens*. Deux hôtes nouveaux ont été identifiés pour ce pathogène, *F. nitida* et *Podocarpus macrophyllus*.

## Introduction

Species of *Ficus* are commonly used as interior ornamentals in Alberta. In 1983 a die-back disease in *F. benjamina* L. responsible for decline and death of a significant number of plants was observed at Smith and Gordon Horticulturists, Ltd., Edmonton. A review of literature revealed that a disease with similar symptoms was first reported on *F. carica* L. by Grove (4). It was later reported on *F. benjamina* in the U.S.A. (1, 3, 6). From Canada the only report appears to be that by Hampson (5) from Newfoundland. *Phomopsis cinerescens* Trav. was identified to be the causal agent of this disease on *Ficus* spp. (1, 3-6). This article deals with the occurrence of this disease on *F. benjamina* in Edmonton, Alberta and reports two additional hosts for the pathogen.

## Materials and methods

The diseased materials of *F. benjamina* were obtained from Smith and Gordon Horticulturists, Ltd., Edmonton. They were examined by light and scanning electron microscopy (SEM). For the latter, the material was air-dried, vapour-fixed with osmium tetroxide, coated with gold and examined in a Cambridge Stereoscan 150 SEM. Pure cultures on potato-dextrose agar were established by transferring the conidia exuded from the pycnidia.

The diseased material of *Podocarpus macrophyllus* (Thunb.) D. Don was also obtained from the holding warehouses of the company mentioned above while that of *F. nitida* Thunb. was collected from a local hotel lobby.

## Results and discussion

The diseased plants of *F. benjamina* showed progressive die-back and defoliation symptoms. The bark was shrunken and the wood tissue of the twigs was discolored and showed zone lines (Fig. 1). The asexual fruiting bodies, pycnidia, were present in groups sunken in the bark. The conidia were exuded in long tendril-like cirrhi (Figs. 2-4) or in the form of droplets. The conidia were aseptate, hyaline and of two kinds (Figs. 5, 6). The $\alpha$-conidia were generally ellipsoidal, often uniguttulate and 5.9 - 9.2 $\times$ 1.8 - 3.1 $\mu$m in size. The $\beta$-conidia were filiform, mostly hamate, eguttulate and 17.9 - 31.9 $\times$ 1.0 $\mu$m. Some pycnidia contained only the $\beta$-conidia whereas the others had both types of conidia (Figs. 5, 6). Examination of the cultures on PDA indicated that the $\alpha$-conidia were formed first but as the cultures aged, the $\beta$-conidia became predominant.

Fungal structures described above were also observed on the diseased twigs of *F. nitida* and *P. macrophyllus*.

The pathogen was compared with the descriptions given by Grove (4) and Sutton (8) and identified as *P. cinerescens*. The genus *Phomopsis* consists of about 400 species. Most of the species descriptions are directly from diseased plant materials and the species have mostly been delineated based on the host. A number of species are described on gymnospermous hosts some of which (e.g. *P. araucariae*) are morphologically not too different from *P. cinerescens*. It is on this basis that the fungus on *P. macrophyllus* is tentatively identified as *P. cinerescens*. Obviously, as indicated by Sutton (8), the genus is in need of revisionary studies.

In the past various physiological parameters such as acclimatization treatments (2) and maintenance practices including the supply of water (7) have also been implicated in the leaf loss phenomenon in *F. benjamina* indoors. Plants receiving minimum light levels show a higher incidence of twig die-back caused by *P. cinerescens* (1).

These observations are consistent with the fact that *P. cinerescens* is a weak pathogen and parasitises only stressed plants (1). Benomyl and triadimefon soil drenches and benomyl foliar sprays have not proved useful in controlling this disease (1). The practical control measures at this time therefore have to be ones which help maintain clean and vigorous plants. The conidia of *P. cinerescens* are formed in mucilaginous cirrhi and are well adapted to dispersal mechanically, by splashing water or through the agency of contaminated pruning tools (1). The kind of sporogenesis mentioned above is also adapted to insect transmission of the pathogen.

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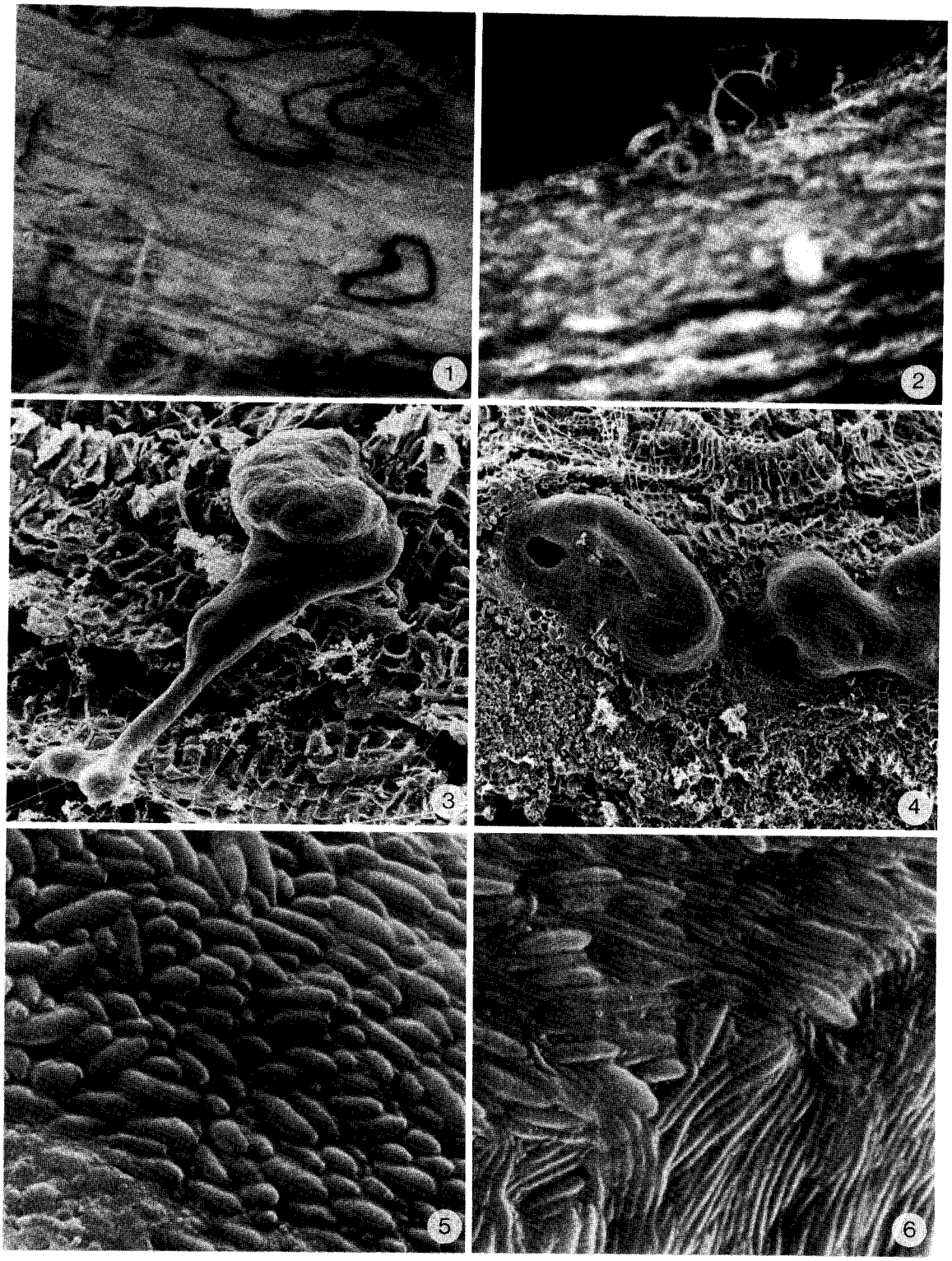


Figs. 1-6. *Phomopsis cinerescens* on *Ficus benjamina*.

1. Debarked twig showing the zone lines. × 10.

2-4. Twig with sunken pycnidia exuding conidia in cirrhi. Fig. 3,4-SEM. 2 × 12; 3 × 200; 4 × 100.

5,6. Pycnidial exudate showing $\alpha$-conidia (Fig. 5) and both $\alpha$- and $\beta$-conidia (Fig. 6). SEM. × 28,500.

Many plants of *Ficus* grown indoors in Alberta are imported from Florida where the pathogen is common outdoors (Robert DeNeve, personal communication). It is therefore possible that many of these plants may already harbour the pathogen before arrival in Alberta. The outdoor environment in Florida is quite conducive for the growth of *Ficus* spp., *Phomopsis cinerescens* being a weak pathogen, therefore, usually does not cause any appreciable disease symptoms in the Florida climate. However, according to Mr. Robert DeNeve (personal communication) the disease has become common in Florida after the 1977 freeze perhaps due to the stress injury caused by the extreme low temperatures. Upon arrival in Alberta, the weakened plants provide an ideal host for *P. cinerescens* due to suboptimal growing conditions indoors. The disease requires more study in order to develop suitable control measures. Although to date it is reported only from Newfoundland and Alberta, it would not be surprising if further studies reveal it to be common indoors all across Canada.

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## Literature cited

1. Anderson, R. G. and J. R. Hartman. 1983. *Phomopsis* twig blight on weeping figs indoors: A case study. Foliage Digest 6: 5-7.
2. Conover, C. A. and R. T. Poole. 1977. Effects of cultural practices on acclimatization of *F. benjamina* L. J. Amer. Soc. Hort. Sci. 102: 529-531.
3. Ellett, L. W. 1979. Diseases and disorders of plants in indoor environments. Commercial Floriculture Notes for Retailers, Coop. Ext. Service, Ohio State Univ. 1: 2-6.
4. Grove, W. B. 1935. British Stem and Leaf Fungi. Vol. 1. Cambridge University Press.
5. Hampson, M. C. 1981. *Phomopsis* canker on weeping fig in Newfoundland. Can. Plant Dis. Surv. 61: 3-4.
6. Hudler, G. W. 1979. *Ficus* problems. New York State Flower Industries Bulletin 104: 10.
7. Peterson, J. C., J. N. Sacalis and D. J. Durkin. 1981. *Ficus benjamina*: Avoid water stress to prevent leaf shedding. Florist's Rev. 167: 10, 11, 37, 38.
8. Sutton, B. C. 1980. The Coelomycetes. Commonwealth Mycological Institute, Kew, England.