Dieback of white birch in central British Columbia

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A dieback of twigs and branches of white birch associated with a species of ***Sirococcus*** is described from the interior wet belt of British Columbia. This is a new host record for a ***Sirococcus.***

Can. Plant Dis. Surv. 66:2, 59-60, 1986.

On décrit un dépérissement des rameaux et des branches du bouleau à papier qui serait attribuable à un ***Sirococcus,*** observe dans la zone pluvieuse de l'intérieur de la Colombie-Britannique. Il s'agit de la premiere mention d'un ***Sirococcus*** sur cet hôte.

Introduction

This report describes the symptoms and signs of a dieback of stems and branches of white birch (***Betula papyrifera*** Marsh) occurring at several locations in the interior wet belt of British Columbia. The associated fungus has been identified as a species of Sirococcus which is characterized by stromatic pycnidia with branched conidiophores and phialides bearing fusoid septate conidia. This coelomycete genus is solely represented in British Columbia by S. ***strobilinus*** (Preuss) (2) which commonly causes a shoot tip dieback of western hemlock (***Tsuga heterophylla*** (Raf.) Sarg.) and sometimes other coniferous genera, but never of a hardwood species. The disease described here bears some resemblance to the dieback of yellow birch found in eastern Canada (1) caused by ***Diaporthe alleghaniensis*** Arnold.

Material and methods

Following the initial collection of dieback of white birch at Summit Lake near Nakusp in **1984,** birches elsewhere in British Columbia were examined for dieback by field staff of the Forest Insect and Disease Survey. Samples of suspect material were forwarded to the Pacific Forestry Centre, Victoria, for examination.

All dieback samples were scrutinized for fungal fruiting bodies which were then sectioned by hand and mounted in lactophenol containing acid fuchsin. Conidia were obtained by wetting fruiting bodies, collecting exuded spores within approximately 1 hour, and mounting them in lactophenol.

Specimens were dried and placed in the herbarium (DAVFP) at the Pacific Forestry Centre.

Results

Collections bearing fruiting bodies were made in **1984** and **1985** from the Summit Lake area where many of the birches were affected. Collections were made in **1985** from Three Forks near New Denver, Grohman Narrows Provincial Park, Nelson and Grampian Park, Nelson.

Fig. 1. Dead terminal bud of white birch with scattered pycnidia of a ***Sirococcus.***

Damage consists of dead distal portions of varying length of the affected stems and branches. Specimens with intact bark and buds were presumed to have been killed in the preceding year. Other specimens with much of their bark broken off or decayed and with few if any buds remaining were presumed to have been dead for over a year.

Pycnidia containing conidia typical of the genus Sirococcus (4) were found only on specimens believed to be no more than

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Accepted for publication April 28, 1986

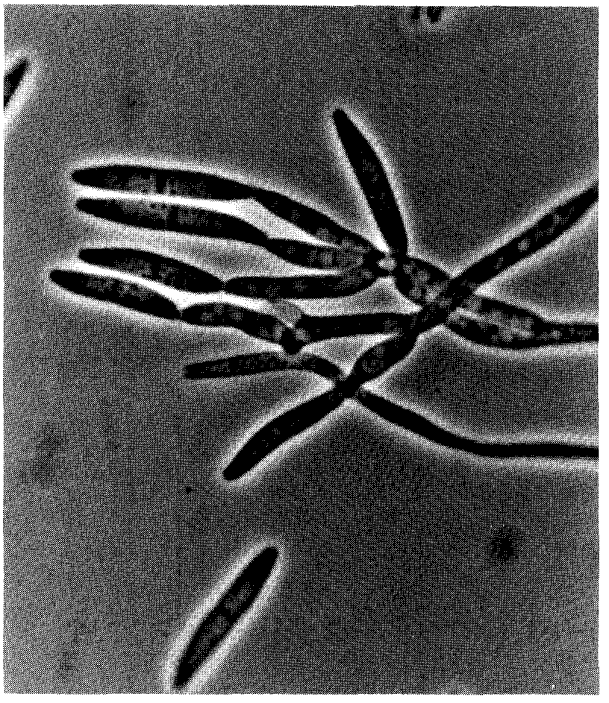

Fig. 2. Conidia of *Sirococcus* on white birch.

one year old. A few structures resembling the pycnidia were observed on specimens with broken bark but none were found containing conidia. The pycnidia were most abundant on buds (Fig. 1) especially at scale margins with a few on affected bark. Pycnidia mostly occurred as clusters but solitary ones occurred too, especially on bark.

Pycnidia are dull black and somewhat irregular in shape though more or less globose. The mean diameter of 100 pycnidia was 0.35 mm with a range from 0.2 to 0.8 mm.

Conidia (Fig. 2) are hyaline fusiform structures. Measurements of 50 spores from each of four collections had a mean length of 17.4 μm with a range of 11.4 to 21.5 μm and a mean width of 3.3 μm with a range of 2.6 to 4.3. Little size variation was observed among collections. Septal frequency (Table 1) varied among collections with some conidia uniseptate, others bi-septate or tri-septate.

Discussion

The occurrence of a Sirococcuson dieback of birch constitutes a new host record for *Sirococcus*. The only species of *Sirococcus* known to occur on hardwoods is S. *clavigignenti,* not known from British Columbia, but causing a canker of butternut (*Juglans cinerea* L.) in Wisconsin (3). A comparison of field and culture material involving the fungus on birch, *S. strobilinus,* and *S. clavigignenti* would be helpful in determining the status of Sirococcus on birch. Meanwhile, the differences in conidial sizes and conidial septation among the species lends support to the view that the fungus on birch is a new species.

Table 1. Percentage of conidia with septae.

Source	0-Septate	1-Septate	2-Septate	3-Septate
Collection				
1	0	30	22	46
2	0	38	32	32
3	0	28	40	32
4	0	36	32	32
Means	0	33	31.5	35.5

Inoculations of birch are required to determine if the fungus described here is capable of causing a stem and branch dieback. Cross inoculations involving S. *strobilinus* would also be helpful. However, the absence of any obervations of other fungi on the dieback samples and the occurrence of this *Sirococcus* at several locations in 1984 and 1985 lends support to the view that it is pathogenic on white birch.

Acknowledgements

We thank staff of the forest Insect and Disease Survey, and especially Mr. R. Turnquist, for their invaluable assistance.

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