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Data Sheets on Quarantine Pests

Ceratocystis virescens

IDENTITY

Name: *Ceratocystis virescens* (Davidson) Moreau
Synonyms: *Ceratocystis coerulescens* Munch
Anamorph: *Endoconidiophora virescens* Davidson
Taxonomic position: Fungi: Ascomycetes: Ophiostomatales
Common names: Sapstreak disease of maple (English)
Notes on taxonomy and nomenclature: The fungus was originally described by Davidson (1944) and distinguished by him on a number of characters from *Endoconidiophora coerulescens*. However, Hunt (1956) reduced the two species to synonomy under the name *C. coerulescens*. Nag Raj & Kendrick (1976) considered that morphological differences in the conidial states might warrant keeping the taxa distinct, and this view has recently been endorsed by Kile & Walker (1987) who state "the narrow phialides and conidia described by Davidson (1944) and present in the type of *C. virescens* have never been described for *C. coerulescens*, although the wide undifferentiated phialides produced by both species are similar. The two species should be kept distinct, as proposed originally by Davidson". There are also differences in metabolite production: *C. coerulescens* cultures have an odour of banana oil (amyl acetate) while *C. virescens* cultures have a musty smell.
EPPO computer code: CERAVI
EU Annex designation: II/A1 - as *Ceratocystis coerulescens*

HOSTS

As a pathogen, the fungus is found on *Acer saccharum*. There is a single record from *Liriodendron tulipifera*. It has also been found as a saprophyte on logs of a number of other woody species. *Acer* spp. (*A. campestris*, *A. platanoides* and *A. pseudoplatanus*) are quite widespread in natural vegetation in the EPPO region, but without a very significant amenity value. Various ornamental forms of the first two species are widely planted, together with numerous introduced ornamental species and hybrids.

GEOGRAPHICAL DISTRIBUTION

C. virescens is indigenous to North America and has not spread to other areas.
EPPO region: Absent.
North America: Canada (single report from Ontario, but
tree since removed), USA (California, Michigan, Minnesota, New York, North Carolina, Vermont, Wisconsin).
EU: Absent.

BIOLOGY

The biology of the fungus is not fully understood. According to Mielke & Charette (1989), wounds appear to be a precondition for infection and it is thought that wounds at or near ground level are the most important. This may mean that ground-traversing insects act as

vectors or that environmental conditions near the ground are favourable for infection. Ascospores and conidia produced on the mycelium seem likely to form the inoculum.

DETECTION AND IDENTIFICATION

Symptoms

The principal external symptoms are the yellowing and dwarfing of leaves on one or more major branches. This leads to local dieback. The entire tree dies within 2-4 years. If an affected tree is cut down, it will be found that, at the base, most of the cross-section is occupied by a zone of yellow-green water-soaked wood. This is most pronounced at the centre of the tree and radiates outwards to give a more or less star-shaped pattern. At the margins blackish-green flecks can be found. If a diseased tree is cut down, a dark-grey mat of the fungus may form on the cut surface within a few days. Endoconidiophores will be present and perithecia may form.

Morphology

Xylem chips taken from the stained wood should yield the fungus in culture. A full description can be found in Davidson (1944). There are two types of endoconidia - microconidia which are hyaline, cylindrical and variable in length (6-25 x 2-3 µm) and short barrel-shaped endoconidia which are 5-9 x 5-6.5 µm. Growth on malt agar is rapid. The mycelium is coarse, dark greenish-grey, with a musty penetrating odour.

Detection and inspection methods

The stain in affected wood is a conspicuous yellow-green when fresh but changes quickly on drying to light-brown (Houston, 1986) and may thus be difficult to detect on wood cut from diseased trees.

MEANS OF MOVEMENT AND DISPERSAL

Apart from possible local spread on insects, the most likely means of disease dissemination is on wood cut from diseased trees. Houston (1986) reported briefly on a study in which diseased trees were felled in October 1984 and then cut into boards and sticker-piled. *C. virescens* sporulated next to stain streaks on some boards and the fungus was still being isolated from surface myceliumafter 2 months and from stained wood after 5 months.

PEST SIGNIFICANCE

Economic impact

In North America, damage is on a small scale at present. The disease is principally found in "sugar bushes", i.e. stands of *Acer saccharum* being tapped for maple sap. However, Kessler (1978) described it as a serious threatto *A. saccharum* forest. Infected trees do not recoverand timber salvage value is low because of the discoloration of the wood.

Control

No control measures are practised.

Phytosanitary risk

C. virescens has not been considered to be a quarantine pest by EPPO or any other regional plant protection organization. Other *Ceratocystis* and *Ophiostoma*species cause serious diseases of forest trees (e.g. *C. fagacearum*, EPPO/CABI, 1996). There is not apparently any direct evidence that *C. virescens* is able to attack *Acer* spp. other than *A. saccharum*, which is in itself of negligible importance for the EPPO region. European *Acer* spp. may conceivably face a risk, lackingadaptation to a *Ceratocystis* disease, but the relative

unimportance of the disease in North America and the lack of any records on other *Acer* spp. make this very hypothetical. In any case, the species is very close to, and thought by many to be synonymous with, *C. coerulescens*, a fungus which is widespread in the EPPO region as a harmless saprophyte.

PHYTOSANITARY MEASURES

Kiln-drying is a method recommended for treating wood against certain quarantine pests, including *C. fagacearum*, and may be effective against *C. virescens*, though there is no direct information on this.

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