

Data Sheets on Quarantine Pests

*Mycosphaerella populorum***IDENTITY**

Name: *Mycosphaerella populorum* G.E. Thompson

Anamorph: *Septoria musiva* Peck

Taxonomic position: Fungi: Ascomycetes: Dothideales

Common names: Septoria canker of poplar (English)

Septoria-Rindenbrand der Pappel (German)

Bayer computer code: MYCOPP

EPP0 A1 list: No. 17

EU Annex designation: I/A1

HOSTS

M. populorum can infect all species of *Populus* native to the USA, although there are large variations in susceptibility to the fungus. It is most important on exotic and hybrid poplars of parentage with *P. balsamifera*, *P. deltoides*, *P. nigra* and *P. trichocarpa*.

Resistance has been reported in *P. alba*, *P. canescens* and *P. nigra* var. *italica*.

For other details, see also Waterman (1951), Peace (1962).

Populus spp. are widely distributed in the EPP0 region, in forests and nurseries.

GEOGRAPHICAL DISTRIBUTION

EPP0 region: Absent.

North America: Canada (British Columbia to Nova Scotia), USA (practically throughout, including Alaska; common in the east and central states).

South America: Argentina.

EU: Absent.

Distribution map: See CMI (1981, No. 540).

BIOLOGY

Pycnidia, which form throughout the summer, are found embedded in both leaf surfaces or in the bark. Conidia are exuded in minute pink tendrils, and early leaf infections may arise from these wind-blown spores. Conidia infect stems via the petiole base or lenticels; wounds do not appear to be necessary for entry. Later, in the autumn, spermogonia are produced both on leaves still on the tree and on fallen leaves. The pseudothecia, which develop during winter, appear on fallen leaves and on cankered bark of 1-year-old stems in the following spring. Infection by ascospores occurs on leaves of young growth and later on stems through wounds, lenticels, stipules or leaf petioles. Neither pseudothecia nor pycnidia are common on cankers, which tend to become invaded by secondary fungi such as *Phomopsis* sp. and *Cytospora* spp. For more information see Thompson (1941).

DETECTION AND IDENTIFICATION

Symptoms

Because of the wide variation in host reaction to stem infection among the different hybrid poplar clones, no distinctive canker can be described. In addition, rapid invasion by secondary fungi tends to mask the presence of this organism. Leaves on the young basal shoots and lowest branches are most commonly infected. Necrotic leaf spots of various sizes appear soon after the leaves develop, about 3-4 weeks after the buds open. These lesions are brown with yellowish-white centres. Small black pycnidia develop through the lesion on both leaf surfaces. The spots rapidly increase in size and number and, under moist conditions, curled pink tendrils of conidia are seen.

On young, vigorously growing shoots, a series of cankers appears; these are dark-brown with black margins and have light-tan centres which may bear inconspicuous brown pycnidia about 4 weeks after infection. These infections are usually less than 1 m from the ground.

On very susceptible hosts, a recent infection appears slightly sunken with several slightly raised irregularly concentric rings of unbroken bark. The cankers may be distinguished from those caused by *Cytospora* and *Nectria* on the basis of sporulating bodies of these fungi, although it is possible that advanced cankers may result from a combined attack of *Septoria* and these fungi.

Stems less than 2 cm in diameter are usually girdled within the season. On larger stems, the wood is killed inward to the pith, producing a flattened canker, swollen at the sides and distorting the stem. On more resistant clones, lesion development is slow and callus formation occurs.

For additional information, see Bier (1939), Waterman (1951), Peace (1962).

Morphology

The prevalence of other fungal fruiting bodies may lead to incorrect diagnosis. It is therefore necessary to locate *Septoria musiva* pycnidia or isolate the fungus from wood at the margin of a canker. Isolations, however, frequently produce cultures of *Cytospora chrysosperma*.

Pycnidia dark-brown, globose or depressed, 45-105 µm wide, with thin walls. Conidia hyaline, cylindrical, straight or slightly curved, variously septate (1-6) 17-56 x 3-4 µm. Spermogonia dark and globose. Asci cylindrical, short stipitate, 51-73 x 12-17 µm. Ascospores hyaline, 1-septate, 17-24 x 3-6 µm.

MEANS OF MOVEMENT AND DISPERSAL

Under natural conditions, *M. populorum* spreads by ascospore dispersal and wind-borne conidia. In international trade, *M. populorum* is liable to be carried on infected seedlings, cuttings or cankered bark of older trees, or infected bark on logs or sawn wood.

PEST SIGNIFICANCE

Economic impact

In North America, this fungus causes practically no damage to native species as a leaf spot disease. However, on exotics and hybrids, it causes severe cankering and dieback, and has resulted in extensive losses in hybrid *Populus* plantings. Although trees of all ages are susceptible, the canker stage is restricted to the bark on younger stems and branches.

Control

In nurseries, several applications of a protective fungicide (such as benomyl) can help to reduce the impact of the disease (Ostry, 1987), but planting of resistant clones remains

the most effective control measure. Ploughing reduces the inoculum levels by turning infected leaves under the soil surface but is not sufficient as such.

Phytosanitary risk

EPPO (OEPP/EPPO, 1980) and IAPSC both list *M. populorum* as an A1 quarantine pest. Many hybrid *Populus* trees grown in the EPPO region could be at risk if this disease gained a hold, since control, once the disease is established, is difficult.

PHYTOSANITARY MEASURES

EPPO recommends (OEPP/EPPO, 1990) that all countries should prohibit importation of plants for planting, cut branches and isolated bark of *Populus* from America. If wood of *Populus* is imported from America the consignment must have been debarked or kiln-dried.

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