

## Data Sheets on Quarantine Pests

*Mycosphaerella gibsonii***IDENTITY**

**Name:** *Mycosphaerella gibsonii* H.C. Evans

**Synonyms:** *Cercospora pini-densiflorae* Hori & Nambu *Cercoseptoria pini-densiflorae* (Hori & Nambu) Deighton

**Anamorph:** *Pseudocercospora pini-densiflorae* (Hori & Nambu) Deighton

**Taxonomic position:** Fungi: Ascomycetes: Dothideales

**Common names:** Brown needle blight of pine, cercospora  
pine blight (English)

**Notes on taxonomy and nomenclature:** Previously, the fungus was only known in its imperfect state but the teleomorph was found and identified as *Mycosphaerella gibsonii* (Evans, 1984).

**Bayer computer code:** CERSPD

**EPPQ A1 list:** No. 7

**EU Annex designation:** II/A1 - as *Cercoseptoria pini-densiflorae*

**HOSTS**

*M. gibsonii* can be very damaging on 1- to 2-year-old seedlings of *Pinus caribaea*, *P. densiflora* and *P. thunbergii*, and on seedlings and in young plantations of *P. halepensis*, *P. pinaster* and *P. radiata* and . It can also attack *P. canariensis*, *P. luchuensis*, *P. massoniana*, *P. merkusii*, *P. resinosa*, *P. strobus* and *P. sylvestris*. Resistance has been reported in *P. clausa*, *P. elliotii*, *P. kesiya*, *P. patula* and *P. rigida*.

Some of these susceptible *Pinus* spp. (such as *P. halepensis*, *P. pinaster*, *P. radiata* and *P. sylvestris*) are widely cultivated in nurseries and are present in European forests, and many other pines have been introduced as ornamental trees.

**GEOGRAPHICAL DISTRIBUTION**

**EPPQ region:** Absent.

**Asia:** Bangladesh, China (Anhui, Fujian, Guangdong, Guangxi, Hunan, Jiangsu, Jiangxi), Hong Kong, India (Madhya Pradesh, Uttar Pradesh), Japan (western half of Honshu, Skikoku and Kyushu), Korea Democratic People's Republic, Korea Republic, Malaysia (Peninsular, Sabah), Nepal, Philippines, Sri Lanka, Taiwan, Thailand, Viet Nam.

**Africa:** Kenya, Madagascar, Malawi, South Africa, Swaziland, Tanzania, Zambia, Zimbabwe.

**Central America and Caribbean:** Jamaica, Nicaragua (reported in one location).

**Oceania:** Papua New Guinea. Unconfirmed report for New Zealand.

**EU:** Absent.

**Distribution map:** See IMI (1994, No. 481).

## BIOLOGY

*M. gibsonii* overwinters as mycelial masses or immature stromata in the tissues of diseased needles. The primary infection source consists of airborne conidia produced in the spring from these needles and spread in the wind or by rain-splash. Transplanted seedlings with diseased needles also serve as an infection source. Conidia germinate between 10 and 35°C (25°C being optimal). The incubation period varies with environment but is thought to be around 6 weeks. Following infection, stromata form in the stomatal cavities, and bear dense conidiophores. For other details see also Chupp (1953), Ito (1972), Mulder & Gibson (1972), Deighton (1987).

## DETECTION AND IDENTIFICATION

### Symptoms

Especially on seedlings 1 to 2 years old, lesions, initially pale-green, then yellowish-brown to grey, appear towards the distal part of the needles; they coalesce, resulting in complete needle necrosis and subsequent needle cast. Dark-brown stromata fill the stomatal cavities, and numerous fruiting bodies appear as sooty spots on the lesions. There is never a reddish tint to the necrotic needle tissues as may occur with other infections.

### Morphology

The disease may be confused with dothistroma blight (*Mycosphaerella pini*), but the pathogen may be distinguished by examination of the conidia (Suto, 1971; EPPO/CABI, 1996).

The fungus may be cultured on V8 juice + pine needle decoction agar, in natural light at 25°C (day), 0-10°C (night). Higher night temperatures (15°C) cause abnormal conidial formation (Suto, 1971).

Stromata dark-brown, tuberculated, filling the stomatal openings, 60-96 µm in diameter. Conidiophores dense, dark-brown, straight or slightly curved, rarely septate and not branched; 2.5 x 10-45 µm. Conidiogenous loci unthickened. Conidia pale-yellowish-olivaceous, long-obclavate, straight or slightly curved, 3-7 septate with a truncate or rounded unthickened base and obtuse tip; 20-68 (mostly 40-50) x 2.5-4.5 µm (Ito, 1972). Asci bitunicate, clavate to cylindrical (33-) 35-38 x 5.5-7 µm, with thickened, bluntly rounded apex, rarely saccate, 32-36 x 6-8 µm, 8 spored, obliquely biseriolate. Interthecial tissue present or absent (Evans, 1984). Ascospores hyaline, 1 septate, ellipsoidal to cuneate, (7.5-) 8.5 x 11 (-12.5) x (1.8-) 2.2 x 2.8 µm, guttulate (Evans, 1984).

## MEANS OF MOVEMENT/DISPERSAL

It is unlikely that the fungus could spread from Africa and Asia as wind-borne spores. However, it could enter on infected seedlings and on cut branches of *Pinus* and, in view of the long incubation period, latent infections present a hazard.

## PEST SIGNIFICANCE

### Economic impact

*M. gibsonii* causes a serious needle blight of both exotic and native pines, particularly at the later nursery stage, and has become a major obstacle to production of pine seedlings (especially *P. pinaster*, *P. thunbergii* and *P. densiflora*) in Japan and Taiwan. Up to 80% mortality occurs in some nurseries. Severe defoliation in young plantations of *P. radiata* occurs in Tanzania, resulting in reduced growth and sometimes even death of the trees (Mulder & Gibson, 1972). The disease is important on *P. merkusii* and *P. caribaea* nurseries in West Malaysia (Ivory, 1975).

### Control

In nurseries, control can be obtained by using maneb (or mancozeb) or copper-based fungicides applied to the current year's and 1-year-old seedlings at 2-weekly intervals during the growing season (Reddy & Pandey, 1973). It is important that all diseased seedlings be removed and burned early in the season when infection occurs.

### Phytosanitary risk

*M. gibsonii* is listed as an A1 quarantine pest by EPPO (OEPP/EPPO, 1980). It is also of quarantine significance to JUNAC. In the EPPO region it is potentially dangerous to *Pinus* spp. wherever grown.

### PHYTOSANITARY MEASURES

EPPO recommends (OEPP/EPPO, 1990) that all countries should prohibit importation of plants for planting (except seeds and tissue cultures), and cut branches of *Pinus* from Africa and Asia.

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