EPPO Datasheet: *Dothistroma septosporum*

Last updated: 2019-07-10

This datasheet was originally written for *Mycosphaerella dearnessii* and *Mycosphaerella pini*.

IDENTITY

Preferred name: *Dothistroma septosporum*
Authority: (Dorogin) Morelet
Taxonomic position: Fungi: Ascomycota: Pezizomycotina: Dothideomycetes: Dothideomycetidae: Mycosphaerellales: Mycosphaerellaceae
Other scientific names: *Actinothyrium marginatum* Saccardo, *Cytosporina septospora* Dorogin, *Dothistroma pini var. keniense* M.H. Ivory, *Dothistroma pini var. lineare* Thyr & C.G. Shaw, *Dothistroma septosporum var. keniense* M.H. Ivory, *Dothistroma septosporum var. lineare* Thyr & C.G. Shaw, *Eruptio pini* (Rostrup) Barr, *Mycosphaerella pini* Rostrup, *Scirrhia pini* Funk & A.K.Parker, *Septoria septospora* (Dorogin) von Arx, *Septoriella septospora* (Dorogin) Saccardo
Common names: Dothistroma needle blight, blight of pine, brown needle blight of pine, needle blight of pine, red-band needle blight of pine
view more common names online...
EU Categorization: RNQP ((EU) 2019/2072 Annex IV)
EPPO Code: SCIRPI



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Notes on taxonomy and nomenclature

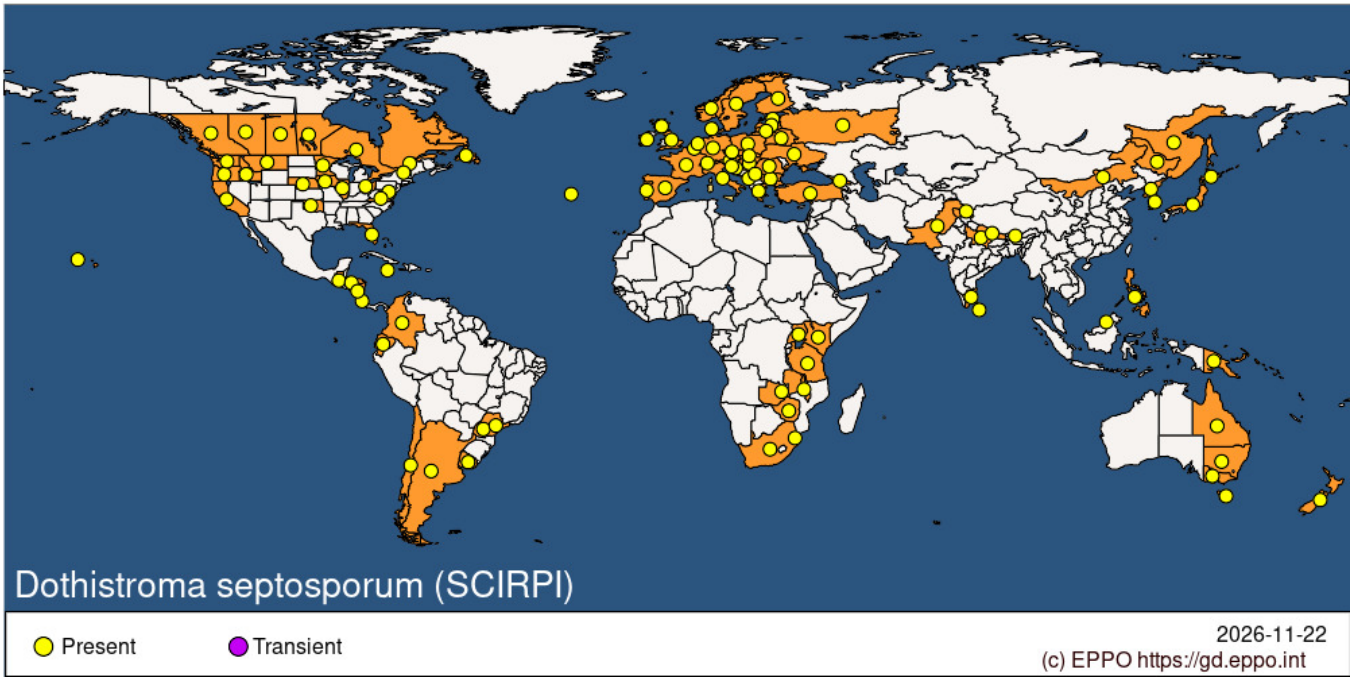
The organism considered is not *Mycosphaerella pini* (Funk & A.K. Parker) v. Arx. See Evans (1984) for full taxonomic treatment.

HOSTS

The principal hosts are *Pinus* spp., and an extensive list has been compiled by Gibson (1979), who also included *Pseudotsuga menziesii* and *Larix decidua*. The most susceptible species of importance in the EPPO region are: *P. canariensis, P. contorta, P. halepensis, P. muricata, P. nigra, P. pinea, P. ponderosa, P. radiata, P. sylvestris, P. thunbergii*. Many of the Central American pine species are resistant or immune. *P. nigra* has proved to be particularly susceptible in Europe (south Germany), whilst *P. sylvestris* shows little infection even when exposed to severely blighted *P. nigra* (Lang & Karadzic, 1987). Lang (1987) also reported it for the first time on *Picea abies*.

Host list: *Abies alba, Abies balsamea, Abies concolor, Cedrus atlantica, Cedrus deodara, Cedrus libani, Larix decidua, Picea abies, Picea sitchensis, Pinus albicaulis, Pinus aristata, Pinus arizonica, Pinus attenuata, Pinus banksiana, Pinus brutia, Pinus canariensis, Pinus caribaea, Pinus cembra, Pinus contorta var. latifolia, Pinus contorta, Pinus coulteri, Pinus densiflora, Pinus elliottii var. densa, Pinus elliottii, Pinus flexilis, Pinus gerardiana, Pinus halepensis, Pinus heldreichii, Pinus jeffreyi, Pinus kesiya, Pinus maximinoi, Pinus monophylla, Pinus mugo subsp. uncinata, Pinus mugo, Pinus muricata, Pinus nigra subsp. dalmatica, Pinus nigra subsp. laricio, Pinus nigra subsp. pallasiana, Pinus nigra subsp. salzmannii, Pinus nigra, Pinus oocarpa, Pinus patula, Pinus peuce, Pinus pinaster, Pinus pinea, Pinus ponderosa, Pinus pumila, Pinus pungens, Pinus radiata, Pinus sabiniana, Pinus sibirica , Pinus strobus, Pinus sylvestris, Pinus tecunumanii, Pinus thunbergii, Pinus torreyana, Pinus wallichiana, Pseudotsuga menziesii*

GEOGRAPHICAL DISTRIBUTION



EPPO Region: Austria, Belarus, Belgium, Bulgaria, Croatia, Czechia, Denmark, Estonia, Finland, France (mainland), Georgia, Germany, Greece (mainland), Hungary, Ireland, Italy (mainland), Latvia, Lithuania, Montenegro, Netherlands, Norway, Poland, Portugal (mainland, Azores), Romania, Russian Federation (Central Russia, Far East), Serbia, Slovakia, Slovenia, Spain (mainland), Sweden, Switzerland, Türkiye, Ukraine, United Kingdom (England, Scotland)
Africa: Eswatini, Kenya, Malawi, South Africa, Tanzania, United Republic of, Uganda, Zambia, Zimbabwe
Asia: Bhutan, Brunei Darussalam, China (Heilongjiang, Neimenggu), India (Jammu & Kashmir, Tamil Nadu, Uttar Pradesh), Japan (Hokkaido, Honshu), Korea, Democratic People's Republic of, Korea, Republic of, Nepal, Pakistan, Philippines, Sri Lanka
North America: Canada (Alberta, British Columbia, Manitoba, Newfoundland, Ontario, Québec, Saskatchewan), United States of America (California, Florida, Hawaii, Idaho, Illinois, Iowa, Maryland, Minnesota, Montana, Nebraska, Ohio, Oklahoma, Oregon, Vermont, Virginia, Washington)
Central America and Caribbean: Costa Rica, Guatemala, Honduras, Jamaica, Nicaragua
South America: Argentina, Brazil (Parana, Sao Paulo), Chile, Colombia, Ecuador, Uruguay
Oceania: Australia (New South Wales, Queensland, Tasmania, Victoria), New Zealand, Papua New Guinea

BIOLOGY

Conidia are exuded in a white or pale-pink, mucilaginous mass during light rain or misty conditions. After release, these germinate in free water between 8 and 25°C, with an optimum at 18°C (Ivory, 1967). Gilmour (1981) recorded no infection below 7°C nor when leaves remained wet for less than 10 h. The incubation period is similar to that reported for *M. dearnessii* (1-4 months), although Karadzic (1989) put this at 4-6 months under Yugoslavian conditions, with the critical infection period occurring from May to June and symptoms appearing in October-November. Serious needle blight is likely to occur following protracted periods of high humidity and temperatures within the range 15-20°C (Gibson, 1979). *M. pini* is indigenous in the cloud forests of Central America (Honduras, Guatemala) at altitudes of 1600-2200 m (Evans, 1984). In these habitats the pathogen is common but never seriously damaging; the teleomorph forms freely on attached and fallen needles and seems to play an important role in the life-cycle. In Africa, South America and Oceania, only the anamorph has been reported (Gibson, 1979; Evans, 1984).

DETECTION AND IDENTIFICATION

Symptoms

As for *M. dearnessii*, the disease first appears on older needles as yellow spots. Generally, however, a profuse reddening develops, and a red pigment may be present around the fructifications. On highly susceptible hosts, red bands containing dense aggregations of stromata are freely formed whilst on other hosts the infected needles appear uniformly reddened or scorched. Reddening of needles has occasionally been observed on *P. radiata* infected with *M. dearnessii* (Evans, 1984); characteristically, however, its fructifications are rarely grouped, being dispersed linearly along the needles. As the disease develops, needle necrosis and subsequent needle cast spreads from the branch bases into the younger foliage. A chronic state may then be reached with the lower parts of the branches denuded and the distal parts bearing isolated groups of diseased needles, often accompanied by the development of epicormic shoots on the stem and major branches.

Morphology

Acervuli initially white, innate, subepidermal becoming erumpent, black, stromatic and cupulate or loculate (pseudopycnidial), variable in size, see above. Conidia hyaline, smooth, thin-walled, with one to five (or up to seven) septa, short-clavate to long-filiform, (8-)10-32(-40) x 1.8-3 µm, with a rounded apex and truncate base. Spermogonia as described for *M. dearnessii*. Ascostromata densely aggregated in red bands, otherwise similar to *M. dearnessii*. Ascospores slightly longer but essentially similar to *M. dearnessii*.

Full descriptions of morphological variation of both these fungi in native Central American pine forests are given by Evans (1984).

PATHWAYS FOR MOVEMENT

Similar to *M. dearnessii*, but the hyaline conidia are less adapted to exposure and thus less likely to be transported by methods other than rain-splash. Mist and low cloud may be involved in long-distance dispersal (Gibson, 1972). The rapid intercontinental spread of *M. pini* was the result of man's movement of live plants or contaminated seed stocks (Gibson, 1974). It was probably introduced into southern Germany on infected *P. nigra* (Butin & Richter, 1983).

PEST SIGNIFICANCE

Economic impact

M. pini causes loss to timber production in susceptible species, notably *P. radiata*, through reduction in growth rate following defoliation. The severity of damage led to the abandonment of *P. radiata* as a major softwood species in many parts of Africa (Gibson, 1979).

Defoliation of more than 25% has a significant effect on diameter increment whilst 50% needle cast reduces this by a half. Repeated attacks lead to tree death. In New Zealand similar losses have been recorded (Pas, 1981), while in Chile a reduction in diameter increment of almost 75% was recorded in 7-year-old *P. radiata*, 1 year after 80% defoliation (Gibson, 1974). *M. pini* has been in the EPPO region for at least 80 years (Evans, 1984) and has been reported sporadically since, but has not had a significant impact on pine cultivation, except perhaps on *P. radiata* in Spain. A combination of low temperature and low humidity may restrict development of this essentially subtropical fungus, although it could be locally important on susceptible hosts in humid Mediterranean regions.

Control

M. pini has been successfully controlled through the use of copper fungicides in New Zealand, where aerial spraying with cuprous oxide or copper oxychloride at 2.24-3 kg active copper per ha is routine practice. Pruning has been recommended to reduce infection in *P. radiata* plantations in Australia (Marks & Smith, 1987).

Phytosanitary risk

M. pini is not listed as a quarantine pest for the EPPO region, although IAPSC does consider it of quarantine

significance. Its presence in the region for many years, without great impact, and its preference for subtropical conditions, indicate that it presents only a low phytosanitary risk.

PHYTOSANITARY MEASURES

EPPO recommends (OEPP/EPPO, 1990) that planting material of *Pinus* should come from an area free from *M. dearnessii*, and in addition that the place of production should have been found free. This requirement, appropriate for an A2 pest, was partly conditioned by the suggestion that *M. dearnessii* was more widespread in the EPPO region than previously thought (see Geographical distribution). If the fungus is really restricted to a small area in Yugoslavia, more severe measures could be appropriate and will be discussed within EPPO. If *M. pini* is to be regulated at all, the existing measures for *M. dearnessii* would seem sufficient.

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