

Data Sheets on Quarantine Pests

*Cronartium kamtschaticum***IDENTITY**

Name: *Cronartium kamtschaticum* Jørstad

Anamorph: *Peridermium kurilense* Dietel

Taxonomic position: Fungi: Basidiomycetes: Uredinales

Common names: Japanese white pine rust (English)

Notes on taxonomy and nomenclature: In Kamchatka and the Kurile Islands (Russia), *C. kamtschaticum* has its telial state on *Pedicularis* and *Castilleja* spp. and its aecial state (*Peridermium kurilense*) on *Pinus cembra*. *P. kurilense* has also been reported on *P. pumila* in Japan, where the telial state is reported on *Pedicularis* and *Ribes*. Japanese workers frequently refer to this fungus as a form of the well known and widely distributed white pine blister rust *Cronartium ribicola*, which is morphologically very similar but typically has *Pinus strobus* and *Ribes* spp. as hosts. This fungus also occurs in Japan. Concern has arisen particularly because of reports of a blister rust on the economically important *P. strobus* in eastern Hokkaido (Japan), which it proved possible to inoculate onto *Pedicularis* spp. and *Ribes* spp. The question thus arises whether there are forms of *P. kurilense* which attack *P. strobus*, or whether, on the contrary, there are forms of *C. ribicola* which infect *Pedicularis* as telial hosts.

The results of inoculation experiments have been inconsistent, and much remains to be elucidated about the taxonomy and biology of these blister rusts in Japan.

Bayer computer code: PERIKU

EPPQ A1 list: No. 18

EU Annex designation: I/A1 - as *Cronartium* spp. (non-European)

HOSTS

The aecial hosts are the five-needled pines *Pinus cembra* var. *sibirica* in Russia and *P. pumila* in Japan, possibly also *P. strobus*. *P. cembra* (arolla pine) is, in the EPPQ region, a mountain species of the Alps and Carpathians whose timber is used for local crafts, but which is not specifically cultivated, except to a limited extent as an ornamental. *P. pumila* (dwarf Siberian pine), also referred to as a form of *P. cembra*, is similarly a high-mountain species in Asia, grown to a very limited extent as a dwarf ornamental in Europe. *P. strobus* (Weymouth pine) is a North American species which was at one time widely planted in Europe, but which has been practically abandoned as a forest tree because of infection by the white-pine blister rust *Cronartium ribicola*. The telial hosts are species of *Castilleja* and *Pedicularis*, possibly also *Ribes*. The genus *Castilleja* is known in Europe only in Arctic Russia, but some *Pedicularis* spp. occur widely in the Palaearctic region. *Ribes* includes in particular *R. nigrum* (blackcurrant), the main alternate host of *C. ribicola*.

GEOGRAPHICAL DISTRIBUTION

EPPQ region: Russia (but not European Russia).

Asia: Japan, Russia (Siberia; Far East: Kurile Islands, Kamchatka, Sakhalin).

EU: Absent.

BIOLOGY

There is little specific information on the biology of this species. The main features of its biology are most likely to be similar to those of the widespread *Cronartium ribicola* (Phillips, 1988) or the North American *C. coleosporioides* (EPPO/CABI, 1996). See also Bingahm (1973).

DETECTION AND IDENTIFICATION

Symptoms

Infection of the *Pinus* hosts is characterized by fusiform bark swellings on which aecia form. These swellings may later develop into cankers.

Morphology

The fungus is very similar to *C. ribicola* (Laundon & Rainbow, 1971).

MEANS OF MOVEMENT AND DISPERSAL

Cronartium spp. in general, and probably *C. kamschaticum*, can be carried considerable distances as wind-borne aeciospores and can survive considerable periods in the airborne state (Chang & Blenis, 1989). More importantly, these rusts can also enter on plants for planting of the coniferous aecial hosts, as has occurred in parts of the USA. The long incubation periods of these rusts mean that latent infections easily go undetected unless post-entry quarantine is applied. The alternate hosts of *C. kamschaticum* are wild plants which are extremely unlikely to be traded internationally (except the *Ribes* spp. which are possibly hosts). There is no risk in the movement of *Pinus* seeds or pollen.

PEST SIGNIFICANCE

Economic impact

There is no indication that the disease on *P. cembra* or *P. pumila* in the Far East is of any importance. *Pinus strobus* is suffering severe attacks by *Cronartium* spp. in Japan, but there is some confusion as to whether these are *C. ribicola* or *C. kamschaticum* (see Identity).

Control

For *Cronartium* spp. in general, control can be effected by removing infected material and eradicating the alternate host, although this is rarely economically viable. Nurseries should be located away from possible infection sources. Chemical spraying may be feasible in the nursery. It may be noted that some five-needled pines (the European *P. peuce* and the Asian *P. koraiensis* and *P. wallichiana*) are markedly resistant to *C. ribicola*.

Phytosanitary risk

C. kamschaticum is one of the non-European *Cronartium* spp. which have been considered as A1 quarantine organisms by EPPO (OEPP/EPPO, 1983). Since it attacks five-needled pines, it can best be compared with the classic quarantine pest *C. ribicola* (Phillips, 1988). This originated in Asia, presumably on local five-needled pines, and spread to Europe and North America where it made it almost impossible to grow *P. strobus* commercially (*P. strobus* evidently not being the original host of the fungus). The rapid spread of *C. ribicola* in Europe and other new areas was facilitated by the fact that its *Ribes* alternate host was

widespread, and indeed widely cultivated. This is not so for the definitely known alternate hosts of *C. kamschaticum* (*Castilleja*, *Pedicularis*). Though *Cronartium/Peridermium* spp., which could be *C. kamschaticum*, are causing extensive deaths in young plantations of five-needled *Pinus* in eastern Asia, the cause could also be *C. ribicola*, from which *C. kamschaticum* is only debatably distinct. In any case, because of *C. ribicola*, five-needled *Pinus* spp. are practically no longer planted as timber trees in Europe, and it is not clear that *C. kamschaticum* would cause an additional problem. The case for considering it as a quarantine pest for the EPPO region is thus very marginal.

PHYTOSANITARY MEASURES

Since no measures are now taken against *C. ribicola*, there seems to be no need to take any for *C. kamschaticum*. It may be noted that many European countries already prohibit importation of plants of *Pinus* from Asia because of other more important pests.

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