

## Data Sheets on Quarantine Pests

*Cronartium himalayense***IDENTITY**

**Name:** *Cronartium himalayense* Bagchee

**Anamorph:** *Peridermium himalayense* Bagchee

**Taxonomic position:** Fungi: Basidiomycetes: Uredinales

**Common names:** Chir pine blister rust (English)

**Bayer computer code:** CRONHI

**EPPO A1 list:** No. 251

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

**HOSTS**

The aecial host is the three-needled *Pinus roxburghii* (long-leaved Indian pine) only. This is a semi-tropical species, which is grown extremely rarely as an ornamental tree in Europe. The telial hosts are species of *Swertia*: *S. angustifolia*, *S. cordata*, *S. alata*. There is a European species of the genus (*S. perennis*), which occurs mainly in the mountains of Central Europe.

**GEOGRAPHICAL DISTRIBUTION**

**EPPO region:** Absent.

**Asia:** India (western Himalayas) (Bagchee, 1933; Bakshi, 1976), Nepal (Cotter *et al.*, 1987).

**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).

**DETECTION AND IDENTIFICATION****Symptoms**

Resin exudation, cankers and cracked bark are characteristic on *P. roxburghii*. Plants are dwarfed, poorly developed, and needles are shed early. Pycnia protrude through the bark, exuding an orange-yellow fluid and are later followed by the erumpent orange-yellow aecial blisters. For more information, see Bakshi (1976).

**Morphology**

Spermatia hyaline, oval; 3-5 x 1.5-2.3 µm. Aecia cylindric, with a persistent peridium which ruptures irregularly at the sides when mature; 4-12 x 2-6 mm. Aeciospores develop in chains, orange-yellow, oval, with a thick, verrucose wall; 22-31 x 13-19 µm.

rediniospores orange-yellow, oval, with thick, spiny walls; 22 x 16 µm. Telial columns, hair-like, walnut brown. Teliospores light-brown, walls smooth, 0.8 x 2.5 µm thick; 37.5 x 18.5 µm. Basidiospores hyaline, globose; 5.5-6.5 µm.

## MEANS OF MOVEMENT AND DISPERSAL

*Cronartium* spp. in general, and probably *C. himalayense*, can be carried considerable distances as wind-borne aeciospores and can survive considerable periods in the airborne state (Chang & Blenis, 1989). In principle, these rusts can enter on plants for planting of the coniferous aecial hosts, but it is noteworthy that *P. roxburghii* is practically unknown in Europe and there would be no reason to import it. The alternate hosts of *C. himalayense* are wild plants which are extremely unlikely to be traded internationally. There is no risk in the movement of *Pinus* seeds or pollen.

## PEST SIGNIFICANCE

### Economic impact

*C. himalayense* is particularly damaging in nurseries and young plantations of *P. roxburghii*. There have been some serious outbreaks in the 1980s (Shukla & Pandey, 1993).

### 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.

### Phytosanitary risk

*C. himalayense* is one of the non-European *Cronartium* spp. which have been considered as A1 quarantine pests by EPPO (OEPP/EPPO, 1979). Concern with this group of fungi arises largely from the example of the classic quarantine pest *C. ribicola*, which spread from Asia to be very damaging on *P. strobus*, a species which was not its original host. The aecial host of *C. himalayense* (*P. roxburghii*) is of no significance in Europe. However, just as *C. ribicola* moved onto another five-needled pine species, it may be imagined that *C. himalayense* could move onto another three-needled species. There are no native three-needled pines in Europe, but the North American three-needled species *P. ponderosa* (western yellow pine) and *P. radiata* (Monterey pine) are planted to a limited extent as timber trees in central and western Europe respectively, while the Canary Island pine (*P. canariensis*) is planted in Italy. The potential telial host *Swertia perennis* occurs in a band across Europe from the Pyrenees to the Alps in France and Italy, to lower altitudes in Germany, Poland and Russia. It is rare in western Europe, but becomes occasional to the east of its range. It is only in Austria, Germany and Romania that a potential aecial host (*P. ponderosa*) and a potential telial host coincide at any significant frequency (Tutin *et al.*, 1964-1993). Since the susceptibility of the potential aecial and telial hosts to *C. himalayense* is conjectural in both cases, the quarantine status of *C. himalayense* for the EPPO region is very marginal.

## PHYTOSANITARY MEASURES

It is doubtful whether any measures are needed against this fungus. It may be noted that many European countries already prohibit importation of plants of *Pinus* from Asia because of other more important pests.

**BIBLIOGRAPHY**

- Bagchee, K. (1933) Investigations on the infestations of *Peridermium himalayense* Bagchee on *Pinus longifolia*. II. *Cronartium himalayense* n. sp. on *Swertia* spp. *Indian Forest Records, Botany* No. 18, p. 66.
- Bakshi, B.K. (1976) In: *Forest pathology: principles and practice in forestry*, 400 pp. Controller of Publications, Delhi, India.
- Chang, K.F.; Blenis, P.V. (1989) Survival of *Endocronartium harknessii* teliospores in a simulated airborne state. *Canadian Journal of Botany* **67**, 928-932.
- Cotter, H.V.T.; Adhikari, M.K.; Rai, J.B.H. (1987) *Cronartium himalayense*, causal agent of chir pine stem rust, discovered in Nepal. *Plant Disease* **71**, 761.
- EPPO/CABI (1996) *Quarantine pests for Europe*. 2nd edition (Ed. by Smith, I.M.; McNamara, D.G.; Scott, P.R.; Holderness, M.). CAB INTERNATIONAL, Wallingford, UK.
- OEPP/EPPO (1979) Data sheets on quarantine organisms No. 9, *Cronartium* spp. (non-European). *Bulletin OEPP/EPPO Bulletin* **9** (2).
- Phillips, D.H. (1988) *Cronartium ribicola*. In: *European handbook of plant diseases* (Ed. by Smith, I.M.; Dunez, J.; Lelliot, R.A.; Phillips, D.H.; Archer, S.A.), pp. 477-478. Blackwell Scientific Publications, Oxford, UK.
- Shukla, A.N.; Pandey, P.C. (1993) Outbreak of rust in afforested chir pine in the Himalayas. *Indian Forester* **119**, 553-558.
- Tutin, T.G. et al. (1964-1993) *Flora Europea*. Cambridge University Press, UK.