

## Irrigation Water and Stem Lesions on *Betula pendula*

Anna RYTKÖNEN \*

Finnish Forest Research Institute, Helsinki, Finland

**Abstract** – In 1991 *Phytophthora cactorum* was first time isolated from necrotic stem lesions on *Betula pendula* seedlings growing in forest nurseries in Finland. In this study we baited *P. cactorum* from a pond from which a forest nursery is taking its water for irrigation. Juvenile, detached *Rhododendron* and *Ledum palustre* leaves and stem pieces cut from the top of *B. pendula* seedlings were used as baits. Direct isolations were also done from birch seedlings. A simple, but useful technique, the Random Amplified Microsatellites (RAMS) analysis was used to test whether isolates from pond were genetically similar to those actually causing symptoms on birch in the nursery. The pathogenicity of two isolates was also tested. The beta tubulin coding region of all *Phytophthora* isolates were amplified and sequenced. Cloning of the beta tubulin gene region and sequencing of the clones were also done using one isolate. The pathogen was present in the pond every year, but in 2005 no diseased seedlings were found. Lesions were formed on all baits, but *P. cactorum* was only isolated from lesions on *Rhododendron* leaves. Although the isolates from pond and from stem lesions were genetically similar, the isolates showed significant variation in both cultural and morphological characteristics as well as differences in pathogenicity. Beta tubulin gene sequences were identical in all studied *P. cactorum* isolates. Interestingly, two distinct sequences of beta tubulin gene were detected from all studied isolates. One of them was identical to the most often reported *P. cactorum* allele in GenBank, whereas no exact match was found for the other allele. The result indicates that our *P. cactorum* isolates might exhibit heterozygosity in the beta tubulin gene. Other possible explanation is that the genomes of the isolates contain two separate beta tubulin gene locuses. Either possibility has not been previously reported in *Phytophthora* species.

---

\* anna.rytkonen@helsinki.fi; Lintulahdenaukio 12 A 10, 00500 Helsinki, Finland