

## Risk assessment on the potential for the biocontrol agent (*Phlebiopsis gigantea*) to develop a necrotrophic capability

**Hui Sun<sup>1</sup>, Paulin Lars<sup>2</sup>, Edward Alatalo<sup>2</sup>, Fred. O. Asiegbu<sup>1</sup>**

<sup>1</sup>Department of Forest Sciences, University of Helsinki, PO Box 27, FIN-00014 Helsinki, Finland

<sup>2</sup>DNA Sequencing and Genomics Lab, Institute of Biotechnology, University of Helsinki, P.O.Box 56, FIN-00014 Helsinki, Finland

*Phlebiopsis gigantea* as a basidiomycete shares significant homology to *Heterobasidion annosum* at genome level. While *H. annosum* is a necrotrophic pathogen and the main cause of root and butt rot disease of conifer trees, *P. gigantea* is mostly saprotrophic and used as its biocontrol agent. Although *P. gigantea* has for many years been used as biocontrol agent, nothing is known about the mechanism of its mode of action. Due to its intensive use in commercial forestry and the ability to colonize fine roots, there has been concern that it might develop a necrotrophic habit. Using a combination of histochemical, molecular and genomics approach, we investigated: if induced resistance is a mechanism for the biocontrol action as well as characterized the temporal and spatial patterns of host responses to both fungi. The transcript profiling revealed that both fungi were able to provoke induction of genes important for lignification and host defences. The results suggested that lignification induced by *P. gigantea* is a contributory factor on its effectiveness to restrict *H. annosum* invasion. Additionally, cell regeneration around necrosis in tissues inoculated with *P. gigantea* compared to *H. annosum* suggests that *P. gigantea* have limited ability to develop into a potential necrotroph.