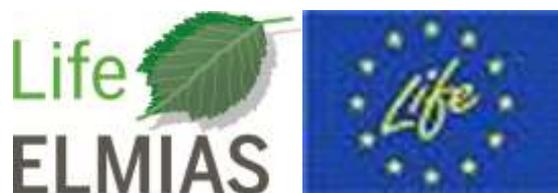


# **LIFE+ ELMIAS Ash and Elm, and IUFRO WP 7.02.01 Root and Stem Rots Conference (LIFE-IUFRO)**

26 August - 1 September 2018, Uppsala and Visby, Sweden

## **PROGRAM & BOOK OF ABSTRACTS**

*Edited by Rimvys Vasaitis*



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#### **48. The endophytic fungus *Rhodotorula*-P5 induces a priming effect in *Ulmus minor* promoting the protection against *Ophiostoma novo-ulmi***

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The antagonism of certain endophytes against the pathogenic fungus *Ophiostoma novo-ulmi*, causal agent of Dutch elm disease (DED), suggests they could be involved in tree tolerance mechanisms. To test this function, in a first trial plantlets of tolerant and susceptible elms to DED were inoculated with *O. novo-ulmi* and *Rhodotorula* sp. strain P5 (putative antagonistic endophyte) separately. In order to compare the plant responses to both, the endophyte and the pathogen, the presence of both fungi and the expression of 13 genes were quantified in the shoots of these plants. A typical defense response mediated by salicylic acid was observed in all genotypes with both fungi, regardless of their degree of tolerance. However, this response was greater with the pathogen inoculation. In a second trial, a third treatment was incorporated: the pre-inoculation with P5 one week before *O. novo-ulmi* inoculation. On this occasion, besides quantifying the presence of both fungi and analyzing the expression of the same genes, total phenols and flavonoids contents, and oxidative stress were measured. On the one hand, all genotypes showed an overexpression of different genes when they were inoculated with the pathogen, among them- were those that code for pathogenesis-related (PR) proteins. On the other hand, the overexpression was non-existent or reduced with the dual inoculation treatment. The positive influence of the pre-inoculation with P5 was also observed in the rest of analyses, e.g. the oxidative stress and concentration of total phenols and flavonoids increased in response to the pathogen inoculation, while no difference compared to control plants was observed in P5-*Ophiostoma* inoculated plants. As a conclusion, the defense responses induced by *Rhodotorula*-P5 could promote priming in *U. minor* plants, contributing to the enhancement of plant tolerance against DED.