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Virulence of *Fusarium circinatum* is associated with perturbation of phytohormone homeostasis in *Pinus pinaster* seedlings

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Plants have developed complex molecular strategies to face the attack of a pathogen in order to maintain their survival, and phytohormones are known to play a crucial role in plant-pathogen interactions. The aim of this study is to elucidate the role of phytohormones in *Fusarium circinatum* virulence, the causal agent of pitch canker disease, known as one of the most important pathogens of conifers worldwide.

Methodology and Theoretical Orientation: For this purpose, by a dual RNA-sequencing approach, we determine the expression profiling of both organisms during the interaction at 3, 5 and 10 days post-inoculation.

Findings: *Pinus pinaster* showed moderate resistance at the early time points. This may be explained, at least in part, by the early recognition, the induction of pathogenesis-related proteins and the activation of complex phytohormone signaling that involves crosstalk between three main protagonists: Salicylic acid, jasmonic acid and ethylene. Moreover, we hypothesise the key steps where the pathogen could be manipulating host phytohormone balance to its own benefit, contributing to pathogen virulence. Upon examination of the pathogen

transcripts, we propose that *F. circinatum* prevents salicylic acid biosynthesis from the chorismate pathway by the synthesis of isochorismatase family hydrolase (ICSH) genes, perturbs ethylene homeostasis in the host by expression of genes related to ethylene biosynthesis, and could be blocking jasmonic acid signalling by COI1 suppression.

Conclusion and Significance: Targeted functional testing using *F. circinatum* mutants in future studies would be needed to support this hypothesis.

Biography

Laura Hernández Escribano is currently a PhD student in the National Institute of Agricultural and Food Research and Technology, Center for International Forestry Research (INIA-CI-FOR), working in the field of plant pathology with the thesis named “*Fusarium circinatum* – host interaction: Ecological and molecular aspects of the pathogenic and endophytic association”. She has a degree in Biology and masters in “Applied Vegetable Biology”, by the Complutense University of Madrid.

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