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ABSTRACT BOOK

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Environmental Microbiology/Microbial Ecology /Microbial Communities - Part III

DUAL RNA-SEQ UNEARTHED THE UNSUCCESSFUL RESPONSE OF A PHYTOPATHOGENIC OOMYCETE TO THE ANTAGONISTIC STRATEGIES IMPLEMENTED BY THE BIOCONTROL BACTERIUM LYSOBACTER CAPSICI AZ78

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Backgrounds

The establishment of plant diseases also depends on the outcome of the complex microbial interactions occurring between pathogenic microorganisms and their antagonists residing in the rhizosphere.

Objectives

The molecular mechanisms activated in the interaction between the beneficial rhizobacterium *Lysobacter capsici* AZ78 and the soilborne phytopathogenic oomycete *Phytophthora infestans* were finely dissected using a dual transcriptomic approach.

Methods

Simultaneous transcriptional changes of both *L. capsici* AZ78 and *P. infestans* occurring after 6 and 24 h of interaction were analysed. The transcriptional profiling of *L. capsici* AZ78 was mainly characterized by the up-regulation of genes involved in the biogenesis of type 4 pilus and lytic enzymes (cellulases, glucanases and proteases)involved in the host colonization and the subsequent attack of *P. infestans* cell wall, respectively. The activation of detoxification processes allowed *L. capsici* AZ78 to overcome the defence activity of *P. infestans*. Moreover, genes deputed to the antibiotic biosynthesis were up-regulated in *L. capsici* AZ78 resulting in the up-regulation of genes involved in programmed cell death in *P. infestans*. The consequences of the activation of these processes resulted in the overall down-regulation of primary metabolic pathways in *P. infestans*, such as carbohydrate, nucleic acids and protein metabolisms.

Conclusions

The dual transcriptional analysis revealed that the antagonistic activity of *L. capsici* AZ78 is based on transcriptional activation of motility, attachment, lytic and antibiotic processes. On the other hand, the activation of programmed cell death in *P. infestans* could explain its inability to actively respond to *L. capsici* AZ78 attacks.