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A halotolerant growth promoting rhizobacteria triggers induced systemic resistance in plants and defends against fungal infection

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Abstract

A halotolerant rhizobacteria, *Klebsiella* species (referred to MBE02), was identified that had a growth stimulation effect on peanut. To gain mechanistic insights into how molecular components were reprogrammed during the interaction of MBE02 and peanut roots, we performed deep RNA-sequencing. In total, 1260 genes were differentially expressed: 979 genes were up-regulated, whereas 281 were down-regulated by MBE02 treatment as compared to uninoculated controls. A large component of the differentially regulated genes were related to phytohormone signalling. This included activation of a significant proportion of genes involved in jasmonic acid, ethylene and pathogen-defense signalling, which indicated a role of MBE02 in modulating plant immunity. *In vivo* and *in vitro* pathogenesis assays demonstrated that MBE02 treatment indeed provide fitness benefits to peanut against *Aspergillus* infection under controlled as well as field environment. Further, MBE02 directly reduced the growth of a wide range of fungal pathogens including *Aspergillus*. We also identified possible molecular components involved in rhizobacteria-mediated plant protection. Our results show the potential of MBE02 as a biocontrol agent in preventing infection against several fungal phytopathogens.

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6411892/