**Volatile-mediated inhibitory activity of the biocontrol agent *Lysobacter capsici* AZ78: a result of multiple factors interaction**

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Plant beneficial rhizobacteria are able to inhibit the growth of soilborne phytopathogenic fungi and oomycetes through the release of a relevant number of volatile compounds. Based on this, we investigated the ability of the biocontrol agent *Lysobacter capsici* AZ78 (AZ78) to produce volatile organic compounds (VOCs) that may contribute to its efficacy in controlling soilborne phytopathogenic fungi and oomycetes. AZ78 significantly reduced the growth of *Pythium ultimum*, *Rhizoctonia solani* and *Sclerotinia minor* through the release of VOCs in split Petri dish assays. The GC-MS analysis revealed that AZ78 produced 22 VOCs and most of them were putatively identified as mono- and dialkylated methoxypyrazines. Exposure to 2,5-dimethylpyrazine, 2-ethyl-3-methoxypyrazine and 2-isopropyl-3-methoxypyrazine determined a drastic reduction of *P. ultimum*, *R. solani* and *S. minor* mycelium growth in split Petri dish assays. However, a remarkable difference between the toxicity of the pyrazines and the AZ78 total volatile blend was observed. This difference led us to further investigate the volatile-mediated inhibitory activity of the biocontrol bacterium. Further experiments revealed the ability of AZ78 cells to produce ammonia that caused the alkalinization of the physically separated growth medium in split Petri dishes assays. As a consequence, the mycelium growth of the tested phytopathogenic fungi and oomycetes was negatively affected on the alkalinized growth medium. Results achieved in this work clearly showed that volatile-mediated inhibitory activity of AZ78 mainly relies on the interaction between the toxicity of VOCs, ammonia and the alkalinization of growth medium.

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