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Characterization of the volatilome of *Lysobacter* capsici AZ78 and its bioactivity against soilborne plant pathogenic fungi and oomycetes

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Antibiotics, toxins and volatile organic compounds (VOCs), are some of the plethora of secondary metabolites produced by soil bacteria. These secondary metabolites have been shown to impact on microbial interactions in the soil. Here, we studied the activity and production of VOCs emitted by *Lysobacter capsici* AZ78, a soil bacterium, which produces non-volatile secondary metabolites toxic against plant pathogens [1]. Recently, it has been shown that VOCs produced by *L. capsici* DSM 19286 grown in a protein rich medium were highly active against *Phytophthora infestans in vitro* [2]. In contrast, the VOC-mediated inhibitory effect was attenuated when the strain was grown in a sugar rich medium. Based on these findings, we studied the effect of medium composition on the inhibition activity of *L. capsici* AZ78 against plant pathogens (e.g. *Rhizoctonia solani*). In parallel, GC-MS was combined with dynamic headspace (DHS) extraction and thermodesorption to investigate both type and relative amount of VOCs produced by the bacterium grown in media with crescent sugar (glucose) concentrations. Generally, VOC emission profiles exhibited mainly quantitative and not qualitative differences. The chemical group of pyrazines was the most abundant in the volatile profile of *L. capsici* AZ78 growing in the various media. We additionally conducted experiments using a setup with Petri dishes having two compartments, where we measured the VOCs profile in the one compartment when the bacterium was growing on crescent sugar concentrations in the other. We confirmed the presence of the identified VOCs, thus giving an insight into which compounds could participate in *L. capsici* AZ78 bioactivity, exhibited during the pathogen inhibition assay. Currently, we are examining the inhibitory effects of the identified compounds against various plant pathogens *in vitro*, with the aim to understand the mechanisms of VOC-mediated microbe-microbe communications and to select bioactive VOCs for the further development of novel biopesticides.

References

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