Outlook

Contact 9th Meeting of the Swiss Microbial Ecology from sebastien.bruisson@gmail.com

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Type of presentation:
Oral presentation

Title:
Volatile-mediated interaction between plant-associated beneficial microorganisms and phytopathogenic fungi

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Abstract (300 words maximum): :
Emission of volatile organic compounds (VOCs) is an important mean of communication among microorganisms. These volatiles have various effects, they contribute to the stabilization of microbial communities, they can attract or repel different species or display antimicrobial properties. Recently, several evidence have shown that the volatilome emitted by a microorganism depends on the volatiles of its surrounding. Thus, the volatilome of two different microbes grown together is different from the sum of the two individuals grown separately. These differences may include inhibition and promotion of compounds, and the production of new compounds. However, the set up used so far to highlight these kinds of interactions has several drawbacks, including artificial volatile overaccumulation, oxygen limitation and the impossibility to assign a producer to the compounds newly emitted during the interaction.
To solve this problem, we have developed a solution able to trap the whole volatilome of an organism and to use it to expose another one unilaterally. By combining this method with comparative Gas Chromatographic–Mass Spectrometry, it is thus possible to study the volatile-mediated interactions more precisely by identifying the compounds responsible for the changes in the volatilome and the emitter of newly produced compound.
We have used this procedure to study volatile-mediated interactions between the biocontrol fungus Trichoderma simmonsii and the two plant pathogens Botrytis cinerea and Fusarium oxysporum. Our results show that the perception of each pathogen's volatilome triggered a specific

response, resulting in significant changes in the VOCs emitted by Trichoderma. Trichoderma's volatilome modulation was overall stronger when exposed to the VOCs from Fusarium than to the VOCs from Botrytis, which correlated with increased siderophore production. Our newly developed method will not only help to better understand volatile-mediated interactions in microbes but also to identify new molecules of interest, as well as the putative-inducing signals themselves.
