

8th World Congress on

PLANT GENOMICS AND PLANT SCIENCE

August 10-11, 2018 Osaka, Japan

Antagonistic effect of bacteria and fungi on Fusarium wilt pathogen

Cenek Novotny, Andrea Palyzova, Katerina Svobodova, Lucie Sokolova and Jiri Novák

Institute of Microbiology of the CAS, Czech Republic

Biocontrol agents represent an alternative to chemicals in the management of fungal crop diseases. A wide range of microorganisms can be used as biocontrol agents, mainly bacterial and fungal isolates and the biological control results from many types of interactions between organisms. In our study, *Fusarium oxysporum* f.sp. *conglutinans* was confronted with three different biocontrol agents, *Trichoderma harzianum*, *Bacillus amyloliquefaciens* and *Pseudomonas aeruginosa* in dual cultures. Bioassays and metabolites produced in the microbial interactions were screened by a Matrix-Assisted, Laser Desorption/Ionization (MALDI) mass spectrometry. *T. harzianum* exhibited the strongest inhibition of mycelial growth of *F. oxysporum* by overgrowing the pathogen in the later stages of co-cultivation. The metabolite profiles obtained in the case of *T. harzianum* and *B. amyloliquefaciens* were the result of an attack on the *F. oxysporum* mycelium by the antagonists by means of membrane-attacking peptaibols and a number of antimicrobial lipopeptides and siderophores, respectively. The biocontrol activity of *T. harzianum* and *B. amyloliquefaciens* consisted in their ability to suppress the production of mycotoxin beauvericin by *F. oxysporum*. In the case of *P. aeruginosa*, siderophores pyoverdine E/D and two rhamnolipids were produced as major bacterial metabolites. Under the conditions of a co-culture with *F. oxysporum* the production of rhamnolipides by the bacterium was blocked by the action of the fungal phytopathogen. The biocontrol of *F. oxysporum* by *P. aeruginosa* was weaker than those by *T. harzianum* and *B. amyloliquefaciens*.

Biography

Cenek Novotny is an Associate Professor, has his expertise in the fields of physiology and biochemistry of bacteria, yeasts, ligninolytic basidiomycetes and bacterial and fungal phytopathogens. His research included the investigation of biofilms of bacteria and fungi, microbial interactions in mixed biofilms, antagonisms between microorganisms and biodegradation of recalcitrant organopollutants in water and soil. He is currently working at the Institute of Microbiology, CAS, Prague and the University of Ostrava, Czech Republic. He has coordinated five Czech and 14 international research projects and published 68 papers.

novotny@biomed.cas.cz