Carbon- iron- dependency of *Pseudomonas donghuensis* P482 ability to produce antimicrobials and form biofilm

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Fluorescent bacterial strains from the genus *Pseudomonas* often show antagonistic properties against bacterial and fungal plant pathogens. The strain *Pseudomonas donghuensis* P482, isolated from tomato rhizosphere, inhibits growth of bacterial phytopathogens from *Dickeya, Pectobacterium* and *Pseudomonas* genera. It also limits growth of several fungal plant pathogens. Therefore, it might be considered as a potential biological control agent. The genome of P482 was sequenced, but its detailed metabolic profile remains unknown. Literature data show, that bacterial secondary metabolism is strongly influenced by environmental factors. Our preliminary data indicate that nutrients presence such as carbon and iron source have the significant effect on *P. donghuensis* P482 secondary metabolism.

The aim of the research is to provide information on the ability of P482 to produce antimicrobials and form biofilm in various conditions of carbon and iron sources availability.

To test carbon and iron sources effect on P482 ability to produce antimicrobials, I apply two approaches, both utilizing minimal growth medium with variable carbon/iron sources. The first approach is testing the P482 strain direct antibiosis against bacterial plant pathogens on the mentioned media. The second approach is the extraction of secondary metabolites from P482 cultures grown in the liquid minimal media supplemented as mentioned above. Those experiments will be performed for the wild type P482 strain as well as for P482 strain mutants lacking antimicrobial activity or having defective carbon (eg. glucose dehydrogenase knockout) and iron metabolism. I have already obtained four mutants of P482, defective in the genes encoding a transcription factor Fur, a ferredoxin, a ferredoxin dehydrogenase and an iron-binding protein IscA. Metabolomic profiling, siderotyping and gene expression analysis are also planned as a part of my research. Finally, biofilm formation on abiotic surfaces in different nutritional environment will be tested during the course of my study.

First results show that there are at least two distinctive metabolic pathways leading to the antimicrobial activity of P482 strain, differently regulated by carbon sources such as glucose and glycerol. The obtained results indicate that pyoverdine siderophore synthesis pathway is important in case of P482 antibacterial activity regardless of nutritional conditions.

Results obtained throughout this study should provide wider insight into *P. donghuensis* P482 metabolomic characteristics, which will be useful during potential application research.