FLUORESCENT PSEUDOMONADS AS PLANT GROWTH PROMOTERS AND BIOCONTROL OF ROOT-INFECTING PATHOGENS ON MAIZE PLANT

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ABSTRACT

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Possibility of manipulating some of the efficient strains of rhizospheric fluorescent pseudomonads to manage the root-infecting pathogens of maize was studied throughout this study. Out of 110 isolates, 24 of *Pseudomonas* species, recovered from the rhizosphere of maize and sugar beetshowed high antagonistic effect against two major root-infecting pathogens of maize, namely *Cephalosporium maydis* and *Fusarium verticillioides in vitro*. Pot experiment revealed that just 4 isolates could reduce infection with both pathogens and enhance the plant growth as well. Based on the genotypic identifications, they could be identified as: *Pseudomonas putida* Pau9, *P.putida*Pau11,*P.putida* Psf3 and *P.aeruginosa*Psf9.Assay ofextracellular enzymes revealed that cellulase was actively produced, only by *P. aeruginosa* Psf9. Chitinase, however was detected in growing media of three strains, but not by *P. putida* Pau11. Assay of antibiotics produced by the bacterial strains showed that phenazine could, only be produced by *P. aeruginosa* Psf9. HCN was found to be excreted by*P. putida* Psf3 and *P. aeruginosa* Psf9. Except *P. putida* Pau9, the IAA could be produced by the other three strains. All strains were able to produce siderophores, and caused availability of P and K. GC-MS analyses revealed that different compounds were detected within the metabolites produced by each of *Pseudomonas* strains under study. Coating maize seed with the mixture of the four strains and seeding in potted-soil infested singly with one of the two target pathogens, or in combination revealed that fresh and dry weights of resulting plants were significantly increased compared with the control. Treatment caused significant increase in root lengths, but insignificant increase in shoot lengths. This is correct in soil infested with

C. maydis. Whereas,in soil infested with *F. verticillioides*, treatment caused significant results in all of the growth parameters of plants. Combining the two pathogens in soil showed that insignificant effect of coating seed with the mix of bacteria on any of shoot or root lengths. Whereas, significant results were found in shoot and root weights compared to the non-treated control.

Keywords: Fluorescent Pseudomonads, *Cephalosporiummaydis. Fusarium verticillioides,* Maize plant, GC-MS analyses bioagent.

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