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Research Article

Selection of potential rhizobacterial isolates from ginger rhizosphere against bacterial wilt caused by *Ralstonia solanacearum*

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ABSTRACT

Eleven rhizobacterial isolates including the reference cultures of *Pseudomonas fluorescens* were evaluated for growth promotion and disease suppression *in vitro* based on various parameters *viz*., antagonism index, vigour index, hydrogen cyanide, ammonia and IAA production, 'P' solubilization and each was scored as per a modified standard score chart. Accordingly, the plant growth promoting index (PGPI) of 11 rhizobacteria were calculated based on the above six parameters and it was observed that four isolates out of 11 *viz*., RB-22, RB-144, RB-11 and RB-82 showed a PGPI of above 70 whereas the lowest index was recorded with RB-151. TLC analysis of growth regulators produced by the test isolates revealed that though all the cultures produced auxins and their related compounds, only two isolates *viz*., RB-141 and RB-11 produced both gibberellic acid as well as auxins. It was observed that all isolates produced considerable amounts of salicylic acid in varying amounts with the maximum by the two reference cultures followed by the isolates RB-11 and RB-22. The maximum number of antibiotics was produced by the isolate RB-22 comprising of pyoluteorin, pyrrolnitrin, pyocyanin and unidentified metabolite and this was closely followed by RB-144, RB-66, RB-11 and P.f2 which produced three antibiotics. The antibiotic 2, 4 DAPG was produced by RB-66, RB-11 and P.f2 apart from certain unidentified ones.

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INTRODUCTION

Ginger, one among the major highly valued spice crops grown in the country, is incited by the ubiquitous soil borne pathogen, *Ralstonia solanacearum*, causing bacterial wilt incidence. This pathogen inflicts heavy crop losses in ginger cultivation, thus affecting the economic well being of the cultivators. Currently, much importance is given to eco-friendly management strategies such as the use of bioagents due to the ecological hazards inflicted by the excessive use of plant protection chemicals. It is widely accepted that plant growth promoting rhizobacteria are known to rapidly colonize the rhizosphere and suppress soil borne pathogens at the root surface (Rangajaran *et al*., 2003). These organisms can also be beneficial to the plant by stimulating growth (Moeinzadeh *et al.,* 2010). Among these organisms, fluorescent pseudomonads are considered to be the most promising group of plant growth promoting rhizobacteria (PGPR) involved in biocontrol of plant diseases (Moeinzadeh *et al*., 2010). They produce secondary metabolites such as antibiotics, phytohormones (Keel *et al.,* 1992) and volatile compounds like hydrogen cyanide (Defago and Haas, 1990). Plant growth-promoting ability of these bacteria is mainly because of the production of indole-3- acetic acid (IAA) (Patten and Glick, 2002). Production of antibiotics such as phenazine-1-carboxylic acid (PCA), pyocyanin, 2-acetamidophenol, pyrrolnitrin, pyoluteorin, Phenazine-1-carboxylic Acid, 2, 4-diacetylphloroglucinol, viscosinamide and tensin in different species of pseudomonads has been reported (Sunishkumar *et al*., 2005). The role of fluorescent pseudomonads in disease suppression caused by *R.solanacearum* has been established by Anith *et al*. (2000). In the present study, the possible growth-promoting and biocontrol potential of 11 efficient