

Identification and characterization of actinomycetes for biological control of bacterial wilt of *Ralstonia solanacearum* isolated from tomato

ABSTRACT

Five actinomycetes which showed antimicrobial activity towards *Ralstonia solanacearum* were identified using specific polymerase chain reaction (PCR) of 16S rDNA gene. Strain C1 and Strain G10 were identified as *Streptomyces aureofaciens* and *S. roseoflavus* respectively. All actinomycetes were then characterized using antimicrobial and extracellular enzyme activity, metabolic and restriction fragment length polymorphism (RFLP) profiles. Strain A3 showed positive reaction to three bacteria namely *Xanthomonas campestris*, *Staphylococcus aureus* and *Listeria monocytogenes*. Strain C1 and Strain I15 showed positive reaction towards *S. aureus* and *X. campestris* respectively. Strains A3, C1 and I15 were able to metabolize xylan and cellulose, while Strain G10 and Strain L8 were able to use all substrates (xylan, mannan and cellulose) as carbon sources. All the *Streptomyces* strains were positive towards more than 25 carbon sources and can be differentiated into five distinct strains. These results were consistent and confirmed with DNA analysis of RFLP profiles. The specific amplification of 16S rDNA PCR restriction profiles for the strains using three restriction endonucleases, resulted two restriction profiles produced from the digested 16S rDNA product using *Hae*III (H1–H2) and *Hinf*I (Hf1–Hf2), while *Pst*I produced three restriction profiles (P1–P3). No profiles were produced from restriction endonucleases of *Xba*I, *Spe*I and *Bam*HI.

Keyword: Actinomycetes; Biological control; *Ralstonia solanacearum*