

ABSTRACT

Rhizospheric actinomycetes were screened for bioactive compound production such as antibiotic, siderophore and cell wall degrading enzyme production against *Fusarium wilt* disease and sheath blight disease in rice by *Fusarium oxysporum* and *Rhizoctonia solani* AG-2. Total of 150 strains were classified according to cultural and physiological characterization such as color of aerial mycelium, color of substrate mycelium and spore chain morphology combined with cell wall composition analysis as *Streptomyces* (52.7 %), non-*Streptomyces* (35.3 %) and unidentified (12 %). Involvement of cell wall degrading enzymes such as chitinase, cellulase and β -1,3-glucanase were investigated. Results showed that strain RHI-43 produced high levels of chitinase (3.50 U/mL), cellulase (4.90 U/mL) and β -1,3-glucanase (0.45 U/mL) while strain RHI-114 produced high levels of protease (15 U/mL). On the basis of dual culture assays, strain RHI-39 and strain RHI-146 were selected on the basis of broad spectrum activities and identified using cell wall composition analysis combined with 16S rDNA analysis and phylogenetic classification, this strain identified as *Streptomyces lydicus* strain RHI-39 and *Streptomyces corchorussi* strain RHI-146. Further, culture filtrates of strain RHI-146 inhibited the growth of all fungal tested which show hyphal swelling and abnormal shapes of tested fungi after observed under microscope. Bioactive compound producing *Streptomyces* could be the ideal strain to control *Fusarium wilt* disease and sheath blight disease of rice.

Keywords: Biological control, *Fusarium wilt* disease, Sheath Blight disease, Bioactive compound, *Streptomyces*