

## Identification and Application of Biocontrol Agents against Cotton Leaf Curl Virus Disease in *Gossypium hirsutum* under Green House Conditions

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**Abstract :** Biological control is a novel approach being used in crop protection nowadays. Bacteria like *Bacillus* and *Pseudomonas* are reported for this purpose and few of their products are commercially available too. Rhizosphere and phyllosphere of healthy cotton plants were used as a source to isolate bacteria capable of exhibiting properties worthy for selection as biocontrol agent. For this purpose all isolated strains were screened for the activities like phosphate solubilization, Indole acetic acid (IAA) production and biocontrol against fungi. Two strains S1HL3 and S1HL4 showed phosphate solubilization and IAA production simultaneously while two other JS2HR4 and JS3HR2 were good inhibitors of fungal pathogens. Through biochemical and molecular characterization these bacteria were identified as *P. aeruginosa*, *Burkholderia* and *Bacillus* respectively. In green house trials of these isolates against Cotton leaf curl virus (CLCuV), seven treatments including individual bacterial isolate and consortia were included. Treated plants were healthy as compared to control plants in which upto 74% CLCuV symptomatic plants exist. Maximum inhibition of CLCuV was observed in T7 treated plants where viral load was only 0.4% as compared to control where viral load was upto 74%. This treatment consortium included *Bacillus* and *Pseudomonas* isolates; S1HL3, S1HL4, JS2HR4 and JS3HR2. Principal Component Biplot depicted highly significant correlation between percentage viral load and the disease incidence.

**Keywords :** cotton leaf curl virus, biological control, *Bacillus*, *Pseudomonas*

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