

## **Biological Control of Soft Rot caused by *Pectobacterium caratovorum* using Lactic acid Bacteria, *Pseudomonas fluorescens* and Botanicals**

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Productivity of various crops is greatly affected due to infestation of diseases caused by microorganisms. More than 100 known bacterial species are able to cause plant disease. *Pectobacterium caratovorum* is the causal agent of bacterial soft rot is one of the most serious diseases that damage to fruits and vegetables in the field as well as in storage. This study was carried out to evaluate the antibacterial activity of Lactic acid bacteria *Pseudomonas fluorescens* and selected plant extracts against to *P. caratovorum*. In- vitro screening of botanicals against soft rot bacteria was done with well diffusion assay and Poisoned food assay by using Potato Dextrose Agar (PDA) and Nutrient agar media. Reason for selecting the botanicals is to evaluate the efficacy of them against to *P. caratovorum*. Bacteria grow well in Nutrient Agar than the Potato Dextrose Agar media. In this study CRD design was used with three replicates of each treatment. The plants such as *Anagalis arvensis*, *Annona squamosa*, *Cassia senna*, *Cymbopogon citratus*, *Vitex negundo*, *Piper longum*, *Aerva lanata*, *Wild Ricinus communis* and *Azadirachta indica* were used to prepare 25% concentrations of aqueous extracts. During the *in-vitro* experiment, remarkable inhibitory percentage was observed in case of leaf extracts of *A. squamosa* (74.91%) followed by leaf extracts *Cassia senna* (68.73%) and *A. arvensis* (68.73%). *P. longum* with *P. fluorescens* and *A. lanata* with *P. fluorescens* were reported (98.86 %) of inhibition followed by *A. squamosa* with *P. fluorescens* (96.85%), *C. senna* with *P. fluorescens* (93.04%) and *V. negundo* with Lactic acid bacteria gave (96.81%) of inhibition followed by *P. longum* with Lactic acid bacteria (93.35%), *A. squamosa* with Lactic acid bacteria (91.93%). In future, investigation on the different concentrations of plant extracts on inhibition of *P. caratovorum* and analyzes the phyto-chemical compounds responsible for the antibacterial activity in botanicals and antagonistic bacteria are suggested.

**Keywords:** Soft rot, *Pectobacterium caratovorum*, Antagonistic bacteria, Lactic acid bacteria, *Pseudomonas fluorescens*.