

Abstract

This study investigated isolation and characterization of bacteria causing degradation of potato in Lahore Pakistan. Identification of bacterial strains in potato is crucial to take proper disease control strategies and to develop plants that have resistance by genetic engineering. This study aimed to report the antagonist activity of *Bacillus thuringiensis* and *Bacillus subtilis* against the potato degrading bacteria. Out of 20 bacterial strains were isolated from rotten potato and 10 of them were found to produce soft rot on potato slices under control environment. Out of 10 soft rot causing strains, 8 were virulent and were characterized and identified. Out of the 8 virulent strains, 5 isolates designated as IP-5, IP-6, IP-8, IP-9, IP-10, were identified as IPS5 *Alcaligenes faecalis*, IPS6 *Alcaligenes faecalis*, IP8 *Bacillus cereus*, IP9 *Proteus mirabilis* and IP10 *Proteus mirabilis*. These strains were controlled with biopesticides by using HD500 *Bacillus thuringiensis*, A1.1 *Bacillus thuringiensis* and *Bacillus subtilis* both *in vivo* and *in vitro* study. After 3 days of incubation with antagonist *in vivo*, infection severity was reduced as compared to untreated ones. Therefore, these strain could be a encouraging candidate to be used as commercial biofertilizer in sustainable agriculture.

Graphical Abstract

