

## Alleviation of Cadmium Stress Through Seed Biopriming on Seed Germination in Tomato

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With the ongoing technological advancements in industrialization and urbanization process, the release of toxic contaminants like heavy metals in the natural resources has become a serious problem worldwide. The heavy metals, particularly has become a multi-ethnic environmental pollutant. Cadmium toxicity has become an important issue due to their constant increase in the environment. In this study, the more serious effect of cadmium are manifested by overall abnormalities and decrease in germination, reduced root and shoot elongation, dry weight, total soluble protein level oxidative damage, membrane alteration, altered sugar and protein metabolisms, nutrient loss all contributing to seed toxicity of tomato cv. PKM 1 gradually decreased with the increasing concentration of Cadmium. Seeds were bioprimed with liquid formulation of plant growth promoting rhizobacteria (PGPR) *Bacillus amyloliquifaciens* 6 %, *B. licheniformis* 4 % were used to alleviate against the heavy metal stress of cadmium through physiological changes of seed germination and seedling growth under laboratory condition. In this regard, the study on seed bioprimed with *B. amyloliquifaciens* 6 % is effective for alleviating the cadmium stress effect on seed germination and seedling growth over the other treatments.

**Keywords:** *Bacillus amyloliquifaciens* , *Bacillus licheniformis* , germination percentage, tomato, seedling length