

# Screening of Bacteria for Biocontrol Activity Against Pathogenic Fungi

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**Abstract**—Wheat is as an important staple food crop around the world. Several biotic and abiotic factors cause significant loss of production of wheat. Among biotic agents such as nematodes, fungus, viruses, bacteria, one of the major plant pathogen *Tilletia indica* ( smut fungus) causing Karnal Bunt , attributes more than 40% yield losses and it is spread by soil borne spores i.e. Teliospores. Considering the harmful effects of fungicides and chemical pesticides on man and the environment, many countries in the world are developing biological control as the better alternative to chemical control. Biological control may be safe, effective and ecofriendly method for plant disease management. It has been reported that some bacteria show broad spectrum antagonistic activity against plant pathogens.

Present study aims to determine *in vitro* antagonistic efficacy of different gram positive and gram negative bacteria against wheat pathogenic fungus *T. indica*. Measurement of mycelial growth of *T. indica* was done on every 7<sup>th</sup> day interval up to 120 days by pour plate method. In dual culture assay and assay for volatile metabolites, specific species of *Bacillus* revealed significantly higher inhibition on tested pathogen. One of the efficient antagonistic strain of *Bacillus* was found to cause morphological changes in the pathogenic fungus under *in vitro* culture condition. This result was attributed to the production of diffusible and volatile compounds having antagonistic activity. Antifungal compounds (secondary metabolites) were extracted from bacteria with equal volumes of ethyl acetate, hexane and methanol and were tested to determine the inhibitory activity against pathogenic fungus.

These experimental results showed the fungicidal effects of bacterial species and their future prospects as biocontrol agents.

**Keywords:** *Tilletia indica*, Karnal Bunt, *Bacillus* spp., biocontrol.