

Microbial Bioagent Triggered Biochemical Response in Tea (*Camellia sinensis*) Inducing Resistance against Grey Blight Disease and Yield Enhancement

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Abstract : Microbial bioagents, viz., *Pseudomonas fluorescens*, *Bacillus subtilis*, and *Trichoderma viride* were assessed for their ability to suppress grey blight caused by *Pestalotiopsis theae*, a major disease of tea crop in Assam. The expression of defense-related phytochemicals due to the application of these bioagents was also evaluated. The individual bioagents, as well as their combinations, were screened for their bioefficacy against *P. theae* in vitro using nutrient agar (NA) as basal medium. The treatment comprising a combination of the three bioagents, *P. fluorescens*, *B. subtilis*, and *T. viride* showed significantly the highest inhibition against the pathogen. Bioformulation of effective bioagent combinations was further evaluated under field condition, where significantly highest reduction of grey blight (90.30%), as well as the highest increase in the green leaf yield (10.52q/ha), was recorded due to application of the bioformulation containing the three bioagents. The application of the three bioformulation also recorded an enhanced level of caffeine (4.15%) and polyphenols (22.87%). A significant increase in the enzymatic activity of phenylalanine ammonia-lyase, peroxidase and polyphenol oxidase were recorded in the plants treated with the microbial bioformulation of the three bioagents. The present investigation indicates the role of microbial agents in suppressing disease, inducing plant defense response, as well as improving the quality of tea.

Keywords : enzymatic activity, grey blight, microbial bioagents, *Pestalotiopsis theae*, phytochemicals, plant defense, tea

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