In vitro Evaluation of the Antagonistic Potentials of Two Trichoderma Species Against Different Fusarium Isolates to Assess Isolate Dependent Responses in Plant Disease Suppression

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Fusarium species are plant pathogens that reduce crop yields and contaminate food with harmful mycotoxins. Because long-term reliance on chemical fungicides can lead to resistance and environmental concerns, alternative control strategies are needed. In this study, I evaluated the antagonistic potential of two Trichoderma species against 50 Fusarium isolates under controlled in vitro conditions. A dual culture assay was conducted on Potato Dextrose Agar, and Fusarium radial growth was measured on days 3, 6, and 9 to determine inhibition relative to control plates. By Day 9 most isolates showed between 40–65% growth inhibition, with maximum suppression reaching approximately 78% in highly responsive isolates. However, responses were not uniform. A small number of isolates exhibited lower inhibition (approximately 22–30%) or partial recovery over time, indicating that antagonistic interactions are isolate-dependent and dynamic. Statistical analysis using a one-tailed paired t-test confirmed significant growth reduction, and large Cohen’s d values reflected strong biological effects. These results demonstrate consistent but variable suppression of Fusarium and highlight the importance of screening multiple isolates when evaluating biological control agents.

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King Abdulaziz &amp
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