

SUMMARY AND CONCLUSION

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The present study entitled “**Induction of Defense Related Enzymes and Growth Promoting Traits in Tomato (*Lycopersicon esculentum*) Plant**” was conducted with the objective of studying the effect of plant growth promoting rhizobacteria, namely, *Pseudomonas fluorescens* on the control of ‘damping off disease’ in tomato plants caused by *Pythium aphanidermatum* by analyzing selected defense related compounds induced such as polyphenol oxidase, peroxidase, phenylalanine ammonia lyase and total phenols, hormones like indole acetic acid and gibberellic acid and biometric parameters such as root length, shoot length and total chlorophyll content.

In the present study, the selected tomato seedlings were subjected to four treatments (with talc based formulation of only bacterial isolate AUPF8, talc based formulation of bacterial isolate AUPF8 challenge inoculated with *Pythium aphanidermatum*, talc powder alone and *Pythium* alone) and then allowed to grow. The defense - related compounds, namely, phenylalanine ammonia lyase, peroxidase, polyphenol oxidase and total phenols, growth hormones such as indole acetic acid and gibberellic acid and biometric parameters like root length, shoot length and chlorophyll content were studied in the plantlets on the 0th, 3rd, 5th and 8th days of treatment.

The results of the study are summarized as follows:

- ❖ The best treatment for the tomato seedlings studied is T1 (AUPF8 + *Pythium aphanidermatum*) since it induced the maximum production of the defense – related enzyme phenylalanine ammonia lyase, peroxidase and polyphenol oxidase from the 0th day upto the 8th day of treatment.
- ❖ T1 (AUPF8 + *Pythium aphanidermatum*) treated plants produced more number of polyphenol oxidase isoforms in native- PAGE than the other plants.

- ❖ T1 (AUPF8 + *Pythium aphanidermatum*) treated plants also produced the highest levels of hormones like indole acetic acid and gibberellic acid when compared to the other treatments.
- ❖ The biometric parameters such as root length, shoot length and chlorophyll content were the highest for T1 treated plants.

Thus it can be concluded that Plant Growth Promoting Rhizobacteria (PGPR) *Pseudomonas fluorescens* AUPF8 is effective in counteracting damping off disease in tomatoes caused by *Pythium aphanidermatum* by inducing production of more defense related compounds such as phenylalanine ammonia lyase, peroxidase, polyphenol oxidase and total phenols, hormones like Indole acetic acid and Gibberellic acid and increasing biometric parameters, namely, Root length, shoot length and chlorophyll content.

Suggestions for Future Studies

- To study other biochemical parameters that may contribute to defense against plant pathogens.
- To study diseases other than damping off disease in tomatoes.