

## Eco-Friendly Control of Bacterial Speck on *Solanum lycopersicum* by *Azadirachta indica* Extract

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**Abstract :** Tomato (*Solanum lycopersicum*) is attacked by *Pseudomonas syringae* pv. tomato causing speck lesions on the leaves leading to severe economic casualty. In the present study, aqueous fruit extracts of *Azadirachta indica* (neem) were sprayed on a single node of tomato plants grown under controlled contamination-free conditions. The treatment of plants was performed with neem fruit extract either alone or along with the pathogen. The parameters of observation were activities of polyphenol oxidase (PPO) and lysozyme, and isoform analysis of PPO; both at the treated leaves as well as untreated leaves away from the site of extract application. Polyphenol oxidase initiates phenylpropanoid pathway resulting in the synthesis of quinines from cytoplasmic phenols and production of reactive oxygen species toxic to broad spectrum microbes. Lysozyme is responsible for the breakdown of bacterial cell wall. The results indicate the upregulation of PPO and lysozyme activities in both the treated and untreated leaves along with de novo expression of newer PPO isoenzymes (which were absent in control samples). The appearance of additional PPO isoenzymes in bioelicitor-treated plants indicates that either the isoenzymes were expressed after bioelicitor application or the already expressed but inactive isoenzymes were activated by it. Lysozyme activity was significantly increased in the plants when treated with the bioelicitor or the pathogen alone. However, no new isoenzymes of lysozyme were expressed upon application of the extract. Induction of resistance by neem fruit extract could be a potent weapon in eco-friendly plant protection strategies.

**Keywords :** *Azadirachta indica*, lysozyme, polyphenol oxidase, *Solanum lycopersicum*

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