**Comparative analysis of PR gene expression in tomato inoculated with rhizobacterial Lipopolysaccharides against Fusarium oxysporum f. sp. lycopersici**

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The eliciting factors of beneficial rhizobacteria inducing defense response in host plants are different from that of the pathogen induced defense mechanism by plants. Rhizobacteria do not damage host tissues or localized necrosis on host plants. However, elicitation of the rhizobacteria mediated resistance shares certain similarities in the generation of non-specific response with that of the response induced by general pathogen associated molecular patterns (Van loon and Bakker 2005). Several rhizobacterial determinants are known till now that helps in the induction of resistance in host plants. Well known and the most important bacterial determinant used is bacterial lipopolysaccharide (LPS) present in the outer membrane of the bacterial cell wall. Besides this, siderophore, salicylic acid, exopolysaccharides (EPS), flagella, antibiotics, volatile metabolites etc., are also widely used (Ramamoorthy et al 2001).

The present investigation deals with the role of bacterial lipopolysaccharides (LPS) in induced resistance elicited by beneficial rhizobacteria have not been extensively reported. The objectives of this study were to examine the capacity of purified LPS extracted from Alcaligenes faecalis MSS8 mediated plant defense protein induction in tomato against Fusarium oxysporum f. sp. lycopersici (FOL) and the evaluation of enhanced pathogenesis related (PR) proteins induced by LPS involves disease resistance. Spectrophotometric analysis of plants inoculated with MSS8 LPS against pathogen challenge showed a significant increase of the PR proteins such as peroxidase (PO), polyphenol oxidase (PPO), phenylalanine ammonium lyase (PAL), chitinase and β-1, 3-glucanase activity after 48h of LPS exposure as compared to positive and negative control. Zymographic study of the prominent enzymes peroxidase and polyphenol oxidase from the plant tissue at 48h of incubation after LPS exposure showed increase in the isoform of PO and PPO in the plants treated with LPS challenge inoculated with FOL.

Expression profile of three defense related genes were analyzed by real time PCR in the tomato plant treated with rhizobacterial LPS in response to the pathogen FOL attack. LPS of the rhizobacterial MSS8 showed significant induction of the defense enzyme PO as indicated by the results of gel activity staining was also confirmed by the quantitative RT-PCR analysis of the tomato plant on 48h after FOL challenge. LeChi9 transcript was upregulated on the 24h of FOL challenged plant as compared to the MSS8 treated LPS. Plants inoculated with LPS of MSS8 and challenged with FOL started showing gene expression at pre-inoculation of FOL, it is upregulated at 24h of pathogen challenge and at 48h maximum expression in post inoculation as well. Upregulation of LeGluB was found in the FOL treated plant at 24 h after inoculation thereby the

relative expression decreases gradually at 48 h and 72 h. Whereas, MSS8 LPS treated plants showed induction of maximum gene expression of LeGluB at 48 h and remains almost same at 72h of inoculation. The pathogen treatment in the pretreated plants with LPS showed negligible change during the course of time after challenge inoculation. While in the case of LePR1 transcript pattern accumulation was found in all the three treatment started at 24h but maximum accumulation was observed at 48h and then gradually decreases. The data of the relative gene expression analysis of all the three PR proteins were expressed at different level as compared to the untreated control.