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Analysis of plant gene expression during passion fruit-*Xanthomonas axonopodis* interaction implicates lipoxygenase 2 in host defence

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Passiflora edulis is the major species of passionflowers grown worldwide, mainly for juice production and fresh fruit, in climates ranging from cool subtropical (purple variety) to warm tropical (yellow variety). The bacterial leaf spot, caused by *Xanthomonas axonopodis pv. passiflorae* (Xap) can be a serious disease affecting passion fruit production in commercial orchards, particularly under moist field conditions. In this study we describe a first analysis of host gene expression in this pathosystem. We used suppression subtractive hybridization to construct two cDNA libraries enriched for transcripts induced and repressed by Xap, respectively, 24h post inoculation with a highly virulent strain. High-quality sequences were obtained resulting in 998 unisequences that were used for annotation. In accordance with BLASTX results performed by Blast2GO tool, 86.7% of the unisequences showed similarity to other plant species proteins related to different functional categories. Sixty-three transcripts were similar to *Arabidopsis thaliana* defence-related proteins identified in the PLAZA platform. In silico predicted protein-protein interactions were detected on the basis of the STRING database for 35 of the 63 defence-related proteins. At this early stage of interaction, a set of genes was selected from Blast2GO categorization results and analyzed by quantitative PCR (qPCR). The expression profiles changed in response to the pathogen for 76% of these genes (48/63) and the differences in expression ratios ranged from 0.51-fold to 1.83-fold. In later stages of interactions (5 and 9 days post inoculation) when disease-associated symptoms were visible, qPCR analyses were performed for 14 genes selected from both libraries. The expression profiles of all genes were found to be changed by the pathogen. The gene that responded most strongly to the pathogen attack encodes a lipoxygenase 2. In inoculated plants, its expression was induced 500-fold and 300-fold, 5 and 9 dpi, respectively, compared to controls, suggesting an important role of this gene in passion fruit defence. Moreover, we showed that most of the genes involved in well-known pathogen recognition signaling pathways were repressed by Xap and this lends support to the idea that the jasmonic acid signaling pathway fails to be activated during the first hours of interaction.

Biography

Sri Janani J is currently pursuing her BTech Biotechnology in Karunya University, India. She has got Internship at Ben Gurion University, Israel from July 5th-31st 2015. She has participated in EVOGEN 2013-National Level Technical Symposium. She has also participated in Mindkraft 2K'13-National Level Techno Management Fest. She has been ranked 28th position in Coimbatore city at 10th National Science Olympiad.

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