

Pseudomonas putida based bio-formulations for management of bacterial blight in pomegranate

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Abstract

Pomegranate is an important commercial fruit crop of tropical and subtropical part of the world, known for its medicinal and nutraceutical properties. Bacterial blight (BB) caused by *Xanthomonas axonopodis* pv. *Punicae* (Xap) is one of the major constraints for pomegranate cultivation accounting for 60-80% of yield loss. Use of synthetic molecules is most common practice for management of BB, which often pose constant threats of residual toxicity and safety issues among the consumers. Use of biological management of this disease is prospective option, as antibiotics and synthetics have negative impact on non-targeted beneficial microflora and have consumer repercussions on health. With this prospect, we identify a potential candidate bioagent having antagonistic property against Xap and developed a suitable bioformulation for successful management of bb in pomegranate. Impact of the bio-formulation on disease severity was evaluated for two seasons under green house and field condition. Post pathogen inoculation, expression analysis of various defense responsive was carried out using qPCR. Application of the bio-formulation as foliar spray (8 mL/L) recorded 84% of disease protection under green house condition and 72% under field when compared to control. Application of the formulation also imparts resistance against disease by inducing various defense responsive genes such as phenylalanine ammonia lyase, chitinase, callose synthase and pathogenesis related proteins at different time points of post pathogen inoculation. Prophylactic foliar application of the formulation resulted in reduced disease compared to generally used chemicals such as streptomycin sulphate, and Bronopol simultaneously decreasing cost of cultivation. Further, Bio-formulation improved the reproductive parameters like total yield and average productivity when compared to control and regularly used synthetic antibiotic.

Biography :

Mr. Pavan Kumar is a Ph.D research scholar at Basaveshwar Engineering College, Bagalkot. He completed his M.Sc in biotechnology from university of Mysore and bachelors in life sciences from Karnataka University Dharwad, India. He is currently working on enhancement of host resistance in pomegranate against bacterial blight caused by *Xanthomonas axonopodis* pv. *punicae* and

its integrated management. During his research he has developed a rapid detection technique of bacterial blight detection in pomegranate this technique is widely benefited to the farmer community for adopting disease free planting material. He has isolated and identified various bioagents belongs to *Bacillus* and *Pseudomonas* spp. for management of bacterial blight and fungal wilt in pomegranate. Using these bioagent he developed two liquid and powder formulation using plant extracts and calcium