

**Research Article: PR Verma Award for PhD Students – 2015 Runner****Fluorescent Pseudomonads/Abiotic Elicitor–Mediated Induced Systemic Resistance in Cabbage Against *Xanthomonas campestris* pv. *campestris* in Gangetic Alluvial Region of West Bengal****A Roy Barman<sup>1\*</sup> and S Dutta<sup>2</sup>**

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**Abstract**

Black rot of cabbage caused by *Xanthomonas campestris* pv. *campestris* (*Xcc*) is a serious menace in the cultivation of cabbage and other cole crops in West Bengal. In the present investigation, attempts were made for determining the molecular variability of *Xcc* and induced systemic resistance mediated through fluorescent pseudomonads and abiotic elicitors were explored for the management of black rot disease of cabbage under Gangetic Alluvial Region of West Bengal. Thirty-one isolates of xanthomonads were isolated from cabbage and cauliflower and were confirmed through biochemical and molecular characterization using primers targeting *hrpF* homologous to *nolX* host recognition protein. All the thirty-one isolates were identified as *Xcc*. Sequencing of Internal Transcribed Spacer (ITS) regions identified the length of ITS 1, ITS 2 and ITS 3 as 112, 19 and 225 nucleotides. *In silico* phylogenetic study based on ITS sequence alignment could identify very high similarity among *Xcc* isolates and other xanthomonads such as *X. campestris* pv. *raphani*, *X. arboricola* pv. *juglandis*, *X. cassava*, *X. pisi*, *X. oryzae* pv. *oryzae*, *X. vasicola* and *X. cucurbitae* and differentiated seventeen number of *Xanthomonas* species into two major clusters. Studies on the ISR mediated through fluorescent pseudomonads isolates indicated that *Pseudomonas aeruginosa* isolates PT1 and PB3 collected from cabbage phyllosphere and rhizosphere were antagonistic to *Xcc*, Combined application of PT1 using seed treatment, rood dipping and foliar spray reduced the disease incidence by 50.6 per cent followed by foliar application of acibenzolar S-methyl (ASM) at 5 mM. It reduced the disease severity by 48.1 per cent and was not found to differ significantly from *P. aeruginosa* isolates. Changes in enzyme activities including phenol content were all negatively correlated with the disease progression. Under PT1 mediated induced systemic resistance (ISR) in cabbage–*Xcc* system, changes in peroxidase (POX) activity was significantly correlated with the disease progression. However, in ASM mediated resistance in cabbage–*Xcc* system, both phenylalanine ammonia lyase (PAL) and POX activity were significantly correlated with disease progression.

**Key words:** Biocontrol, isozymes, *Pseudomonas aeruginosa*, systemic acquired resistance, *Xanthomonas campestris* pv. *campestris*

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