

PR Verma Award Paper for M Sc Students – Winner 2016

Molecular Characterization and Detection of a Virus Associated with Ring Spot Disease of Bell Pepper (*Capsicum annuum* L.)



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Abstract

Surveys conducted during investigation revealed the presence of a typical ring spot disease in bell pepper in various bell pepper growing areas of Solan district of Himachal Pradesh. The disease incidence was ranging from 5 to 51 per cent during the cropping seasons of 2013 and 2014. The causal organism was characterized as virus on the basis of symptomatology, host range, serology and molecular studies. Infected bell pepper plants exhibited ring spot symptoms of variable sizes on the leaves as well as on fruits which coalesced later on covering the entire surface rendering fruits unmarketable. Samples collected from different locations when subjected to DAS-ELISA yielded strong positive reaction only against Tospovirus (I, II, III) antiserum. Studies on indicator hosts established *Nicotiana tabaccum* var. *White Burley* and *Nicotiana glutinosa* to be the best indicator host for the causal virus. Further studies revealed that members of *Chenopodiaceae*, *Cucurbitaceae*, *Leguminosae* and *Solanaceae* fall within the host range of virus. Infected tomato fruits growing in the vicinity of infected bell pepper fields however, yielded no significant positive results in DAS-ELISA but Reverse Transcription -PCR (RT-PCR) based detection revealed clear association of causal virus with tomato. RT-PCR based detection, nucleocapsid (N) gene sequencing, conserved domain search (BLASTx) for confirmation of encoded protein family and BLASTn analysis of virus isolate indicated that the virus associated with ring spot disease of bell pepper in Himachal Pradesh was Capsicum chlorosis virus, a member of the genus Tospovirus.

Key words: BLASTn, BLASTx, capsicum chlorosis virus, cloning, pDrive vector, RT-PCR, tospovirus

Citation: Bohra Yogita and Handa Anil. 2016. Molecular characterization and detection of a virus associated with ring spot disease of bell pepper (*Capsicum annuum* L.). *J Mycol Pl Pathol* 46 (4): 311-324