

Study on Developmental and Pathogenesis Related Genes Expression Deregulation in Brassica campestris Infected with 16Sr-IX Associated Phytoplasma

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Abstract : Phytoplasmas are phloem-inhibited plant pathogenic bacteria that are transferred by insect vectors. Among biotic factors, Phytoplasma infection induces abnormality influencing the physiology as well as morphology of plants. In 16Sr-IX group phytoplasma-infected brassica campestris, flower abnormalities have been associated with changes in the expression of floral development genes. To determine whether methylation was involved in down-regulation of flower development, the process of DNA methylation and Demethylation was investigated as a possible mechanism for regulation of floral gene expression in phytoplasma infected Brassica transmitted by Orosious orientalis vector by using RT-PCR, MSRE-PCR, Southern blotting, Bisulfite Sequencing, etc. Transcriptional expression of methylated genes was found to be globally down-regulated in plants infected with phytoplasma, but not severely in those infested by insect vectors and variation in expression was found in genes involved in methylation. These results also showed that genes particularly orthologous to Arabidopsis APETALA3 involved in petal formation and flower development was down-regulated severely in phytoplasma-infected brassica and with the fact that phytoplasma and insect induce variation in developmental gene expression. The DNA methylation status of flower developmental gene in phytoplasma infected plants with 5-azacytidine restored gene expression strongly suggesting that DNA methylation was involved in down-regulation of floral development genes in phytoplasma infected brassica.

Keywords : genes expression, phytoplasma, DNA methylation, flower development

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