

Siraprapa Pancharoonrat 2006: Expression of Transgenes in Genetically Engineered – PRSV Resistant Papaya. Master of Science (Agricultural Biotechnology), Major Field: Agricultural Biotechnology, Interdisciplinary Graduate Program. Thesis Advisor: Associate Professor Supat Attathom, Ph.D. 65 pages.
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Transgenic Khaknual papaya harboring the coat protein gene (CP) of *Papaya ringspot virus* (PRSV) was studied for the expression of transgenes. Two transgenic lines namely KN 49 with resistance and KN 1.2.3 with moderate resistance were quantitatively compared for their PRSV-CP mRNA transcripts and the expression of PRSV-CP protein. Complementary DNAs of the PRSV-CP transcripts in both lines as obtained by RT-PCR synthesis revealed only the 848 bp PCR products. The level of PRSV-CP transcript in line KN 49 was lower than line KN 1.2.3. Nucleotide sequence and amino acid sequence of PRSV-CP transgenes from these two transgenic lines showed high similarity to those of the viral CP gene with 99.1-99.8% and 98.2-99.3%, respectively. There was no PRSV-CP protein expressed in all transgenic papaya plants as detected by ELISA and western blot. However, small RNAs specific to PRSV-CP gene were observed in both transgenic lines but not in non transgenic one. Results suggested that resistance in transgenic Khaknual papaya is mediated by post-transcriptional gene silencing (PTGS).

Gene expression in transgenic papaya was conducted by using cDNA library hybridized with probes generated from total RNAs. Results showed that both transgenic Khaknual papayas have the similar profiles of gene expression for 1,320 genes as compared to that of non transgenic one. However, different levels of mRNA expression were observed in some genes.

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