

Chalinee Kongswat 2010: Study of Novel Proteins and Proteomics of Genetically Modified Papaya Resistant to Papaya Ringspot Virus. Doctor of Philosophy (Agricultural Biotechnology), Major Field: Agricultural Biotechnology, Interdisciplinary Graduate Program. Thesis Advisor: Associate Professor Wichai Kositratana, Ph.D. 188 pages.

The expression pattern of two inserted gene, i.e. papaya ringspot virus coat protein (PRSV-CP) and neomycin phosphotransferase (NPTII) protein in transgenic papayas (Khak Nual 116/5 R₄) resistant to papaya ringspot virus (PRSV) were determined and used as a part of substantial equivalence determination in biosafety assessment. Proteins extracted from seedling leaf, mature leaf, mature flower and mature fruit of papaya cv. Khak Nual were analyzed by SDS-PAGE followed by Western blotting. The expression of NPTII protein was only detected in transgenic papaya and mainly in leaf tissue. However, PRSV-CP protein was not detected. Additionally, the protein profile analysis was performed using 2-dimensional polyacrylamide gel electrophoresis (2D-PAGE) to compare the difference of protein spot and identification by matrix-assisted laser desorption ionization time-of-flight mass spectrometer (MALDI-TOF/TOF MS). No significant difference was observed in the protein pattern between transgenic and non transgenic plants based on image analysis by using the ImageMater 2D Platinum software. The similarity of protein expression pattern of transgenic and non transgenic plants from various tissues at seedling and mature stages ranged from 94.46 to 98.72%. However, this similarity was not lower than the similarity between each replication of the samples which were 92.27 – 99.39%. The protein spots found to be different were further identified by *de novo* sequencing using MALDI-TOF/TOF MS and amino acid sequences obtained were compared to known allergen proteins. No protein could be matched with allergen available in AllergenOnline Database according to CODEX standard.

Student's signature

Thesis Advisor's signature