THE CLONING AND EXPRESSION OF VrPDF1 GENE FROM MUNGBEAN PLANTS
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Summary
Plant defensins were a family of small, cysteine-rich proteins found in plants that are active against bacteria, fungi, and especially α-amylase activity of the insect gut. Defensins bound to the active site of α-amylase in the gut of weevil larvae to inhibit starch digestion of larvae, that stunted their growth and weevil would die. In this study, we presented the results of molecular cloning and the expression of defensin 1 (VrPDF1) isolated from some varieties of mung bean which had different levels of resistance to weevils. VrPDF1 genes isolated from mung bean including two exons interrupted by an intron were 356 bp in length. The coding region of the VrPDF1 gene isolated from mRNA of mung bean was 228 bp in length, encoding 75 amino acids. VrPDF1 gene from Tam TH mung bean which had the best resistance to weevils expressed in tobacco. The VrPDF1 recombinant protein with a molecular weight of about 10 kDa was determined by Western blot and ELISA. Recombinant VrPDF1 from the transgenic tobacco effectively inhibited the activity of α-amylase in the gut of weevil larvae. The research results formed the basis for the enhancement of VrPDF1 gene expression in mung bean to create transgenic mung bean lines with high resistant to weevils.

Keywords: Gene expression, mungbean, VrPDF1 gene, weevil-resistance, molecular cloning.