

A Novel Multiple Stress-inducible Peroxidase Promoter from Sweetpotato

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Objectives

We have cloned more than 20 peroxidase (POD) cDNAs from suspension cultures of sweetpotato (*Ipomoea batatas* (L.) Lam.). Among them, *swpa4* was most highly induced by both abiotic and biotic stress, suggesting that this gene was regulated by a multiple stress-inducible promoter (1). In this study, a stress-inducible SWPA4 promoter was isolated by chromosome walking and its six different 5'-deletion mutants were characterized in transient assay using tobacco BY-2 protoplasts.

Materials and Methods

1. Plant materials: Sweetpotato (*Ipomoea batata* (L.) Lam. cv. White Star), tobacco BY-2 suspension cells
2. Methods
 - Promoter cloning by chromosome walking
 - Transient assay by PEG transfection

Results and Discussion

A promoter of genomic clone (referred to as SWPA4) with 2,433

bp of sequence upstream of the translation start site was obtained from sweetpotato by chromosome walking. Sequence analysis reveals that SWPA4 promoter contains putative binding sites for several transcription factors including ELRE, MYBGAHV, ASF1, ABRE, GCN4, W-box and HSF. Employing a transient expression assay in tobacco BY-2 protoplasts, a 2.4 kb promoter and five progressive 5'-deletion mutants, -1934, -1467, -1199, -818 and -433, were fused to the GUS report gene and their GUS activity was analysed. Each deletion mutants showed diverse GUS activity. The -1934 bp deletion mutant showed about 5 times higher GUS expression than the CaMV 35S promoter. The further characterization of SWPA4 promoter is under study.

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References

- Park SY et al. (2003) Molecular cloning and characterization of six peroxidase cDNAs from cell cultures of sweet potato and differential expressions in response to stress. *Molecular Genetics and Genomics* (in press).