A8. Differential expression of genes induced by infestation of Hessian fly in 2RL introgressed wheat line

Jang, C.S., J.Y. Kim, D.S., Kim, W.B., Jeon, D.Y. Hyun, and Y.W. Seo†
Department of Crop Science, Korea University
장철성, 김계윤, 김동섭, 김동배, 현도윤, 서용원†
고려대학교 식량자원학과

Objectives

The objectives of this study were to isolate novel genes induced by infestation of biotype L of Hessian fly larvae in wheat-rye translocation line carrying 2RL and characterize mode of differentially expressed genes between 'Coker797' (non-2RL) and NIL carrying H21 by infestation of Hessian fly.

Materials and Methods

Plant materials: Coker797 and NIL carrying 2RL
Methods: FISH analysis for identification of 2RL introgression in NIL carrying H21
EST analysis for profile of genes induced by infestation of Hessian fly.
SSH method for isolation of novel genes induced by infestation of Hessian fly.
Northern blotting for molecular characterization of differentially expressed three clones (TaCR1, TaLTP3, and TaCOMT1)

Results and Discussion

Biotype L of Hessian fly is recognized as the most virulent form among the sixteen biotypes reported. As a part of approach to elucidate molecular interactions between plants and Hessian fly, cDNA library from NIL with H21 infested by larvae of biotype L of Hessian fly was constructed for EST analysis. As shown in FISH analysis, introgressed 2RLs were detected in NIL possessing 2RL. Of 1056 sequenced reactions attempted, 919 ESTs produced some length of readable sequences. About 80% (730 clones) of 919 ESTs showed significant similarity with amino acid sequences registered in gene bank and were divided into 13 functional categories. In order to study differentially expressed genes between Coker797 (non-2RL) and NIL carrying H21 gene, three clones (TaCR1, TaLTP3, and TaCOMT1) were characterized. TaCR1 encoding cytokinin repressed gene was isolated through SSH method that used NIL infested Hessian fly as tester and Coker797 infested Hessian fly as driver. TaLTP3 encoding lipid transfer protein was isolated among EST clones. TaCOMT1 encoding caffeic acid O-methyltransferase was isolated through SSH method using the tester NIL infested Hessian fly and the driver NIL non-infested Hessian fly. Three clones were further analyzed for responses to the infestation of Hessian fly and abiotic stresses such as MeJA, SA, ethephon, wounding, and H2O2.

† Tel : 02-3290-3005, E-mail : seoag@korea.ac.kr

-48-