
FUNCTIONAL GENOMICS ANALYSIS ON SOME QUALITY TRAITS IN WHEAT PLANTS

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Phospholipase Cs (PLC) are the major cell membrane enzymes which have been recognized as important enzymes for their roles in regulation and signal transduction. Mutations in five Arabidopsis PLCs were tested under osmotic and Absciscic Acid stresses. Two full length wheat PLCs cDNA clones were sequenced and related wheat PLC sequences identified in the GenBank database and characterized. Homeologs to one of the wheat full length clones, Ta-PG-PLC2, with 93% nucleotide sequence identity were identified. Representatives of the three homeologs were mapped to wheat chromosome arms using PCR amplification in diploid wheat ancestors, *Triticum urartu*, *Aegilops speltoides* and *Aegilops tauschii* -and cytogenetic stocks of *Triticum aestivum*. A frameshift mutation was found in PG PLC2-1. This sequence was used to survey the prevalence of the mutation in 21 wheat cultivars and found to be present in all wheat cultivars tested. Changes in mRNA levels were observed in response to osmotic stress, cold acclimation, continuous light and continuous darkness stresses for three homeologs of PG-PLC2. Subcellular localization of the gene product characterized with the green fluorescent protein fused to the C terminus of the Ta- PG-PLC2 was done by transient expression in *N. benthamiana* by *Agrobacterium* infiltration. We found that the homeolog Ta- PG-PLC2-1 which has the frameshift mutation was localized to the vacuole membrane while the gene copy without the mutation was localized to the plasma membrane.