Promoter Analysis of SnRK2 Gene Family in Arabidopsis

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Abstract: Plants are exposed to various environmental stresses this stresses induce the expression of a variety of genes in plants that regulate responses to stress. Transcription factors (TFs) are master regulator that regulate gene expression by binding to *cis*-acting elements in the upstream regions of the genes promoter and have an important role in plant adaptation to abiotic stresses. Sucrose non-fermenting-1-related protein kinase 2 (*SnRK2*) gene family is a group of plant specific serine/threonine protein kinases involved in ABA and abiotic stress signaling. In the present study, we have analyzed the *cis*-acting regulatory elements promoter region of SnRK2 gene family members consist of 10 member (*SnRK2.1* to *SnRK2.10*). For this purpose, the Sequence of each gene for Arabidopsis from the TAIR database was obtained. Then to identify the *cis*-acting regulatory elements, 1kb of sequence upstream from the promoter region of each gene in Arabidopsis genome was selected and the analysis was carried out using the athamap (http://www.athamap.de/), PlantPAN (http://plantpan2.itps.ncku.edu.tw) and PlantCARE (http://bioinformatics.psb.ugent.be/webtools/plantcare/html/) database. The results indicate that the promoter of these genes has a varied number of regulatory elements that the plant responds to environmental stresses through them. Some of the most numerous families of transcription factors were WRKY, bZIP, GATA, SBP, AP2, ERF and bHLH, and the most important *cis*-acting elements including ABRELATERD1, MYB2CONSENSUSAT, MYBCOREATCYCB1, MYB1AT, ANAERO1CONSENSUS, ANAERO3CONSENSUS, MYBATRD22, PREATPRODH and WBBOXPCWRKY1, which are involved in dehydration, anaerobic induction, ABA and hypo osmolarity response.

Keywords: environmental stress; Promoter Analysis; *cis*-acting elements; SnRK2 gene family

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