



Genomic identification of group A bZIP transcription factors and their responses to abiotic stress in carrot

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ABSTRACT. The basic-region/leucine-zipper (bZIP) family is one of the major transcription factor (TF) families associated with responses to abiotic stresses. Many members of group A in this family have been extensively examined and are reported to perform significant functions in ABA signaling as well as in responses to abiotic stresses. In this study, 10 bZIP factors in carrot were classified into group A based on their DNA-binding domains. The *cis*-acting regulatory elements and folding states of these 10 factors were analyzed. Evolutionary analysis of the group A members suggested their importance during the course of evolution in plants. In addition, *cis*-acting elements and the folding state of proteins were important for DNA binding and could affect gene expression. Quantitative RT-PCR was conducted to investigate the stress response of 10 genes encoding the group A factors. Six genes showed responses to abiotic stresses, while four genes showed other special phenomenon. The current analysis on group A bZIP family TFs in carrot is the first to investigate the TFs of Apiaceae *via* genome analysis. These results provide new information for future studies on carrot.

Key words: bZIP; Group A; Transcription factor; Evolution; Abiotic stress; Carrot