

Deciphering the Role of WRKY Transcription Factor in Enhancing Plant Resilience to Alkaline Salt Stress

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Abstract: The WRKY gene family consists of unique transcription factor (TFs) found exclusively in plants. The regulation of gene expression in response to alkaline stress, which is characterized by high pH levels in the soil or growing environment. These TFs play a decisive role in regulating that how plants respond to various abiotic stresses, such as the saline-alkaline, during the different conditions, temperature fluctuations, drought, UV radiation. The research has been conducted by scientists and have a great progressively studying the role and mechanisms of WRKY in several plants' species, including both model plants and essential agriculture crops. The research focus has emerged due to the understanding that alkaline and saline soil stressors considerably hinder global agriculture productivity. Multiple research efforts have underscored the significant biological functions of WRKY TFs in assisting plants in coping with various abiotic challenges in alkaline-salt stress. This review aims to investigate the structural aptitudes of WRKY TFs and their impact on plant responses to alkaline and salt stresses. The objective of this review study is to provide a far-reaching insight into the current state of the field and the importance of WRKY TFs in regulating plant responses to salt and alkaline stress.

Key words: WRKY transcription factors, Salt stress, Saline-alkali stress, Regulatory Process, Hormonal signaling