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Environmental Stresses on Plant

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ABSTRACT

The issues of how plant cells react to different stresses, one of the most interesting discussions is for farmers to plant biology and because of the stress of living in a particular threat to the productivity of agricultural crops are considered. Environmental stresses signals, some of which are outside the cytoplasm are activated by a number of proteins are transported to the nucleus. General signal to the original signal can be divided into three types: 1 - signal related to osmotic or oxidative stress proteins of the MAPK (mitogen activated protein kinases) are required for the activation of 2 - calcium-dependent signals that lead to activation of genes LEA (Late abundant embryogenesis) as class genes DRE / CRT, is 3 - sos signal-dependent calcium ions can control the balance and static. By important genetic approach for analysis of complex processes such as signal transduction are related to stress. Enhance plant tolerance to environmental stresses and non-viable by activating signaling pathways in transgenic plants, a promising and promising approach for producing crops tolerant to environmental stresses. Generally acknowledged to be the appropriate approach in the field of environmental stress tolerance approach all aspects of molecular, physiological and metabolic integrated with the It could be due to the information gap between long-term and short-term effects of genes and their products Between gene expression and molecular and cellular level the gap in the phenotype of plant stress filled including transgenic plants, there are limitations in the way technology is understand that tolerance is a complex non- living because tolerance to environmental stresses normally depends on a number of physiological characteristics each of these properties themselves are controlled by multiple genes.

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INTRODUCTION

Plants compared to other complex mechanisms of living organisms to adapt to environmental changes and challenges. The issue of how plant cells react to different stresses, One of the most interesting discussions, and for farmers to plant biologists because of the stress of living in a particular threat to the productivity of agricultural products are the. It is estimated that non- life stresses such as drought, salinity and temperature The first product in the world are usually reduced, More than 50 percent of the average performance of most major crops are plants (Boyer, 1982).

Besides, the world needs to double by 2050 to respond to the food needs of the population which has rapidly increased (Tilman et al. 2002). This is why understanding the fundamental mechanisms of plant responses to stress or drought tolerant plants alive all these years, much attention has been. Molecular studies in plants have shown that an environmental stress such as drought, salinity and cold stimulates the expression of genes that are responsible for various functions (Bray, 1997). The key non-stress tolerance of plants live in the complex network of factors controlling genes stop writing and other enzymes, proteins and signaling pathways are responsible.

Plant responses to environmental stress at molecular level:

Environmental stress signals, some of which are outside the cytoplasm are activated (Narusaka et al. 2003; Kizis et al. 2002; Xiong et al. 2001; Wu et al. 1997; Xiong et al. 2002).

1 - Signal related to osmotic or oxidative stress proteins of the MAPK (mitogen activated protein kinases) are needed for activation. The production of stress proteins such as MAPK signal transmission is controlled by drought and cold. Protein of signal transmission, the message reinforces stress and coping with stress helps plant

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cells. MAPK activation was then transported to the nucleus where they activate transcription factors and that the phosphorylation. This signal Assimilate production and antioxidant role of osmotic stress and can lead to cell cycle regulation. The phenotype of mutations that occur in connection with these signals include: esk1 (mutations in freezing) and pst1 (mutations in salinity). Esk1 mutations accumulate proline and soluble sugars increased but pst1 mutations lead to increased capacity will be SOS compounds (Tsugane et al. 1999).

2 - A calcium-dependent signals that lead to activation of genes LEA (Late abundant embryogenesis) gene classes such as DRE / CRT, is. LEA proteins of large molecules and cell membranes and protection during late embryogenesis, seed erosion in response to environmental stress arise (Galau et al. 1987). This protein has been proposed as a regulatory protein may decrease the concentrations of ions in the cell are erosion.

3 - sos signal-dependent calcium ions can control the balance and static. This type of signal is in response to salinity and ionic factors in the transfer of control. In general it must be said that in recent years a better understanding of plant responses to stress non- living Issues such as the regulation of transcription factors, stress-responsive gene expression, and characterization of mutant proteins in signal transduction through the receptor Abscisic acid (ABA) has been proposed. For example, physiological experiments under non-stress living, especially drought and salinity have been High levels of gene expression changes associated with the accumulation of ABA in plants, show (Qin et al. 2011).

Genetic engineering of plants to environmental stress tolerance:

It seems that the development of plant genetic engineering by introducing and identifying selected genes accelerates the progress of science is breeding. Specifically, in the not too distant future, genetic engineering and molecular breeding through conventional breeding methods as a rapid method for efficient gene transfer will be discussed. When the gene is a useful addition to the crosses of rare species, or from non-plant sources are distant relatives, genetic engineering as the only option would be to transfer genes.

Application of genomic approaches and strategies to eliminate or dysfunctional genes, in order to accelerate the development of a systemic understanding of complex quantitative traits such as tolerance to the maximum temperature (cold and heat) should be considered. In fact, with the advent of molecular genetics and genetic engineering Biotechnology now is likely to create plants that can withstand adverse environmental conditions than are favorable. Molecular studies have shown that several genes in plants with different functions by environmental stresses such as drought, salinity and temperature are stimulated and inspired. Furthermore, it has been found that most of the genes are active erosion Abscisic acid by plant hormones and other hormones are involved.

In Arabidopsis plant (mouse or grass ear Tal) MBF1 expression of proteins related to transgenic plants tolerant to bacterial contamination, salinity stress, heat and osmotic strengthen. Therefore, to enhance the tolerance of plants for stress proteins MBF1 various inorganic method (Suzuki et al. 2005). Enhance plant tolerance to environmental stresses and non- viable by activating signaling pathways in transgenic plants , A promising and promising approach for producing crops tolerant to environmental stresses (Kasuga et al. 1999).

Achievements and challenges in understanding the molecular basis of stress tolerance in plants alive:

By important genetic approach for analysis of complex processes such as signal transduction are related to stress. A conventional genetic screen based on injury or stress tolerant phenotype to be identified, was successful (Zhu, 2000). In fact, access to facilities has created the possibility of molecular directly useful genes and identification of the plant are complete without phenotype (Sanghera et al. 2011). Transgenic plant technology widely spread in the world due to its features such as live and non-live tolerance in a number of crops have improved and strengthened (Ashraf et al, 2008).

Drought tolerant transgenic crops that have been genetically engineered enzymes that decode the Assimilate synthesis (Bray, 1993) or osmic protectants like glycine betaine (Sakamoto and Murata, 1998) and proline (Zhu et al, 1995) involved. The genetic engineering of some sugar alcohols (mannitol, sorbitol, etc.) is considered as compliant solution to increasing their concentration so as to protect cell membranes and protein complexes (Gao et al., 2000). Detoxification strategy and also the stationary ion in transgenic plants caused the development of this technology has been doubled. Strategies including transgenic plants are detoxification enzymes involved in oxidative stress (including throat peroxidase, superoxide-dismutase, etc.) are decoded (Zhu et al. 1999).

Static stabilization of the ion in sodium excretion out of the roots of transgenic plants or storage in vacuoles is Means to be tolerant plants to salinity (Amudha and BaIasubramani, 2011). The new key genes in the development of drought tolerant types of non- living involved Not only is most important for a better understanding of the environmental stress response but a bright future for the development and modification of crops will bring (Sanghera et al. 2011).

Generally acknowledged to be the appropriate approach in the field of environmental stress tolerance approach All aspects of molecular, physiological and metabolic integrated together to be due to the information gap between long-term and short-term effects of genes and their products Between gene expression and cellular and molecular level, and finally a gap in the study of plant phenotype Stress filled.

One of the major challenges in the development of plants tolerant to environmental stress solution obtained by applying this study is useful and benefits (Qin et al. 2011). Including limitations on the technology of transgenic plants is It is understood that tolerance is a complex non-living Because tolerance to environmental stresses normally depends on a number of physiological characteristics Each of these properties themselves are controlled by multiple genes (Kumar and Bhatt, 2006).

It seems that the studies related to the tolerance of plants to survive stress the following points should be considered further:

1 - Classification of environmental conditions, and accurate assessment of the environmental factors that affect

2 - Most of genomic tools for selection of tolerant genotypes are

3 - Mechanisms associated with tolerance of plants are always In this regard, a mechanism of interaction with other mechanisms or genes associated with stress is considered.

4 - Long-term effects of stress should be considered, not the short-term treatment of 5 - This should be considered a mechanism to deal with stress in plants (e.g. Hydration again) and the molecular basis of stress on are.

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