

**FUNCTIONAL GENOMIC STUDIES ON  
ENVIRONMENTAL STRESS TOLERANCE  
GENES IN ALFALFA (*MEDICAGO  
SATIVA L.*)**

By

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**دراسات جينومية وظيفية عن جينات تحمل الإجهاد البيئي  
في البرسيم الحجازي**

رسالة مقدمة من

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## ABSTRACT

**Mervat Refaey Ibraheem Sayed: Functional Genomic Studies on Environmental Stress Tolerance Genes in Alfalfa (*Medicago sativa* L.). Unpublished ph. D. Dissertation, Department of Genetics, Faculty of Agriculture, Ain Shams University, 2010.**

Alfalfa (*Medicago sativa* L.) is a major perennial forage legume which can grow in slightly saline soil and its salt tolerance ability is higher than other crops. The most salt tolerant and the most sensitive alfalfa landraces, their F<sub>1</sub> and F<sub>2</sub> under salt condition were evaluated for some yield-related traits. Marker assisted selection (MAS) at the molecular basis using RAPD-PCR, ISSR-PCR and AFLP- PCR molecular markers was applied.

Thirteen RAPD and five ISSR primers gave distinctive amplifications and polymorphic patterns among these genotypes. The results showed that all these patterns showed differential responses with respect to salt tolerance. Some specific markers were also recorded using two combinations of AFLP markers. Moreover, these molecular markers were considered as molecular markers for salinity tolerance in *Medicago sativa*.

**Key words:** *Medicago sativa*, Alfalfa, salinity, molecular markers.  
RAPD, ISSR, AFLP- PCR.

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**ABBREVIATIONS**

◉AFLP	Amplified Fragment Length Polymorphism
BAS	Bulked Segregant Analysis
DAF	DNA Amplification Fingerprinting
ECw	Electrical conductivity of Water
ISSR	Inter Simple Sequence Repeats
MS	Molecular Size
NPGS	National Plant Germplasm System
PCR	Polymerase Chain Reaction
PIs	Panicle Initiation
QTL	Quantitative Trait Loci
RAPD	Randomly Amplified Polymorphic DNA
RFLP	Restriction Fragment Length Polymorphism
SCAR	Sequence Characterized Amplified Regions