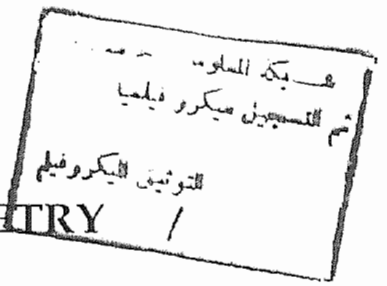
PHYSIOLOGICAL GENETIC STUDIES FOR SALT TOLERANCE ON SOME TISSUE CULTURED WHEAT VARIETIES



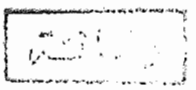
By

EMAD ANIS METRY

A thesis submitted in partial fulfillment

of

the requirment for the degree of



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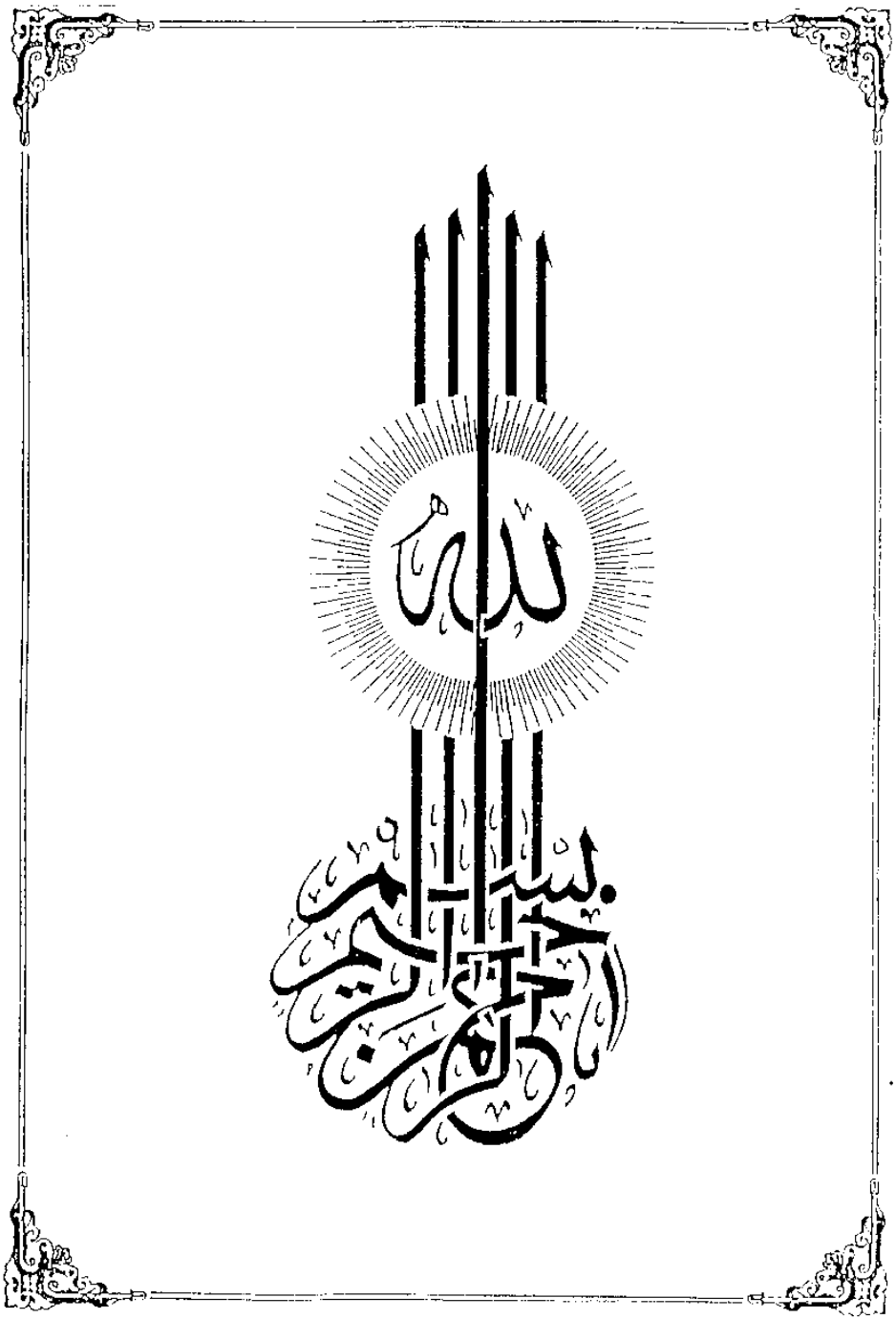

PHYSIOLOGICAL GENETIC STUDIES FOR SALT TOLERANCE ON SOME TISSUE CULTURED WHEAT VARIETIES

By

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ABSTRACT

Wheat varieties; Sakha 8, Sohag 1 and the cross Sohag 1 x Sohag were better for in vitro manipulation than the other varieties. Moreover, they were more salt tolerant and showed an increase in proline levels when treated with 6 and 8 g/l NaCl.

SDS-PAGE analysis showed different protein patterns among the wheat varieties. In addition two different patterns between control and callus treated with 6 and 8g/l NaCl.

Key words

Wheat, Embryo Culture, Salt Tolerance, SDS Electrophoresis, Proline.

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I would like to express my full indebtedness to my parents and brothers for their moral support and sacrifice. Above all, I render all my praies and thanks to the almighty God.

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INTRODUCTION

Today, wheat is grown throughout the world and is the most widely adapted to agriculture of the cereal crops. Wheat is a major crop in every continent. The crop generally is grown without irrigation and 85% is grown in areas where rainfall is less than 900 mm annually. Wheat is the chief food for one-third of the world's population and it provides more nourishment for more people than any other food crop [(Allan, 1980) C. F. Schaeffer *et al* 1984]. For human consumption, wheat has diverse uses and is marketed by quality classes. Wheat is an important animal feed crop and accounts for approximately 10% of all of the grain fed to livestock.

Bread wheat (*Triticum aestivum*) is one of the most important cereal crops in Egypt, about 1.5 million feddans are grown annually with different varieties. However, the total production of wheat is not enough to meet the requirements of human and livestock consumption.

Conventional plant breeding and selection, however, has offered little towards the improvement of crop tolerance to various environmental stresses. Therefore, recent developments in plant tissue and cell culture techniques in combination with

genetic engineering promise to offer a much wider scope of improvement in that respect.

Tissue culture techniques gained ground for wheat improvement, particularly with respect of salt tolerance issue.Howerver, there are several problems related to the application of cell and tissue culture systems.

The objectives of this work reported herein were to :-

1 - Study the initiation, development and maintenance of callus cultures of mature embryos for different wheat genotypes.

2 - Determination of regeneration potential of various wheat genotypes.

3 - Examination of genotypic differences in response to calli, development and regeneration capacity under salinity condition.

4 - Examination the response of tissue cultured plants to high salt concentrations under greenhouse conditions.

5 - Study the total soluble protein, protein pattern and proline accumulation in response to salt stress.

6 - Study the feasibility of producing tolerant genotypes which could tolerate high levels of salt conditions.

REVIEW OF LITERATURE