GENETIC STUDIES IN *Sorghum*

By

SUZAN MOSAAD AHMED MOHAMMED

B.Sc. Agric. Sci. (Biotechnology), Fac. Agric., Cairo Univ., 2004

THESIS

Submitted in Partial Fulfillment of the Requirements for the Degree of

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APPROVAL SHEET

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SUPERVISION SHEET

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Name of Thesis: Genetic Studies in *Sorghum*
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ABSTRACT

This study aimed to assess salt tolerance for eight sorghum genotypes and which of them are more sensitive, using (macro nutrient analysis- protein– isozyme and osmotic potential). According to the analysis, the results showed that the Giza-15 and NEB-Dorado-V9 were the most salt sensitive. The results of molecular markers showed that, the thirteen random primers had a total of 163 scorable bands, 121 of them were polymorphic (74%) and nine SSR markers had a total of 63 scorable bands, 33 of them were polymorphic (52%). Thirty two out of the 154 polymorphic RAPD and SSR markers were found to be genotype specific. Regeneration system was studied for Giza-15 and NEB-Dorado-V9 using mature zygotic embryo, whereas the white embryonic calli were formed within three weeks in the presence of 2.5 mg/l 2.4-D. The somatic embryos directly originated from the embryogenic callus in the presence of 2 mg/l BA. The cultivar Giza-15 showed high regeneration frequency (28%). The main objective of the present work was to gene transfer into sorghum genome. Using *pBI-121* plasmid harboring the *gus* gene under the control of 35-S promoter and NOS terminator. The stable integration of the *gus* gene was confirmed using PCR and Dot blot analysis.

Key words: *gus* gene, sorghum regeneration, transformation, RAPD, SSR.

DEDICATION

I dedicate this work to whom my heart felt thanks: to my father soul, my mother soul, my sisters, my brothers, all my friends and to Professor Sawsan Samy Youssef and Dr. Reda Elwany Moghaieb for all the support and encouragement they continually offered along the period of my post-graduate studies.

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