

دراسات وراثية جزيئية على تحمل الحرارة في الذرة الشامية

رسالة مقدمة من

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للحصول على
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(وراثة)

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**MOLECULAR GENETIC STUDIES ON HEAT
TOLERANCE IN MAIZE (*ZEA MAYS* L.)**

BY

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B.Sc. Agric. Sc. (Genetics), Zagazig University, 2004

A thesis submitted in partial fulfillment

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ABSTRACT

Fatma El-Sayed Mahmoud: Molecular Genetic Studies on Heat Tolerance in Maize (*Zea Mays* L.). Unpublished M. Sc. Thesis, Department of Genetics, Faculty of Agriculture, University of Ain Shams, 2010.

The protein fingerprints of 14 inbred lines were performed using grain water-soluble protein electrophoretic analysis. The protein electrophoretic patterns showed 16 bands, 10 bands of them showed differences between inbred lines. The bands identified 11 inbreds in distinct patterns indicating different genotypes. The effect of high temperature on 17 maize inbred lines exposed to 35°C and 45°C for 4 hours at 14-days old besides control (25°C) was studied. Seven bands of heat shock proteins with molecular weights of 54.6, 28.7, 24.3, 18.2, 18, 14.2 and 12.8 kDa were expressed in ten inbred lines subjected to 45°C. Nine random primers were used to identify and characterize 17 maize inbred lines by RAPD-PCR analysis. The results indicated distinct differences could be used for the identification of maize inbred lines. A total of 106 amplified DNA fragments ranging in size from 1529 to 163 base pairs were recorded, whereas 83 fragments were polymorphic and 23 fragments were monomorphic. The genetic similarity values showed substantial differences among the maize inbred lines. The dendrogram showed that the 17 maize inbred lines could be divided into two main clusters. Four pairs of specific primers were used to amplify thermo-tolerance gene from the local maize inbred line "K1". The sequence of the first fragment gave 241 nucleotide base pairs showed 100% identity in 220 bp with *Zea mays* low molecular weight heat shock protein (hsp22) mRNA.

Key words: Maize, SDS-PAGE, Heat shock protein gene, RAPD-PCR, Electrophoresis.

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