



شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكروفيلم

بسم الله الرحمن الرحيم



MONA MAGHRABY



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جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

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MONA MAGHRABY

**GENE EXPRESSION STUDIES OF GENES
AFFECTING HEAT STRESS TOLERANCE
IN SOME POULTRY LINES**

By

ESRAA IBRAHIM SEIF EL-DEIN IBRAHIM
B.Sc. Agric. Sc., (Genetics), Fac. Agric., Ain Shams University, 2012

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ABSTRACT

Esraa Ibrahim Seif El-Dein Ibrahim: Gene Expression Studies of Genes Affecting Heat Stress Tolerance in Some Poultry Lines. Unpublished M.Sc., Department of Genetics, Faculty of Agriculture, Ain Shams University, 2021.

This study was conducted to determine the effect of heat stress on heat shock protein (HSP70) and heat shock factor (HSF1), through mRNA profiling in two chicken genotypes (Fayoumi and Matrouh). Fayoumi and Matrouh fully mature chickens were divided into two groups. The control group where the two genotypes were reared at room temperature (25°C) in a 55-60% humidity atmosphere. Whereas the treatment group was subjected to heat stress at 39°C for 4 hours in a 55-60% humidity atmosphere. Six blood samples were collected randomly from each genotype to tubes containing 1.0 mg/mL EDTA. Expression levels of *hsp70* and *hsf1* genes were used to assess the heat tolerance of the two Egyptian local genotypes. After four hours of heat exposure, the *hsp70* and *hsf1* mRNA expression analysis revealed higher expression levels in Fayoumi type as opposed to the Matrouh type. These results showed that the acquired thermotolerance is positively linked to the stress memory. Within the two genotypes, Fayoumi type exhibited the highest means for *hsp70* and HSF1 productions, and therefore, the heat stress is better tolerated, which indicates that Fayoumi mortality rate might be lower genetically under heat stress.

Keywords: Mrna; *Hsp70*; *Hsf1*; Heat Stress; Thermotolerance and Mature Chicken.

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LIST OF ABBREVIATIONS

8-OHdG	8-Hydroxydeoxyguanosine
AA	Arbor Acres
aa	Acetic Acid
AHS	Acute Heat Stress
AL	Ad Libitum
BJY	Beijing You chicken
BW	Body Weights
CASP6	Down Regulating Caspase 6
CAT	Upregulating Catalase
CB	Commercial Broilers
CCK	Cholecystokinin
CE	Control Exposed
ChIP	Chromatin Immunoprecipitation Assay
CHS	Chronic Heat Stress
CK	Creatine Kinase
CN	Cou Nu Hubbard
CT	Cloacal Temperature
DD	Hsp70 genotype
CT	Cycle Threshold
ED	Embryonic Days
FABP1	Fatty Acid Transporter 1
Fas	Factor Associated
GOT	Glutamic-Oxaloacetic Transaminase
GPT	Glutamic–Pyruvic Transaminase
GSH-Px	Glutathione Peroxidase
HE	Heat Exposed
HS	Heat Stress
HSE	Heat Shock Element

HSF	Heat Shock Factors
HSP	Heat Shock Protein
HSR	Heat Shock Response
IGF-1	Insulin-Like Growth Factor 1
LDH	Lactate Dehydrogenase
MOS	Mannan Oligosaccharides
mRNA	Messenger RNA
Na	Naked-Neck
NR3C1	Glucocorticoid Receptor
NR3C1	Glucocorticoid Receptor
PBMCs	Peripheral Blood Mononuclear Cells
RJF	Red Jungle Fowl
RO	Ross 508 Aviagen
rpl5	House-Keeping Gene
RR	Respiration Rate
RT-qPCR	Reverse Transcription-Quantitative Polymerase Chain Reaction
SNPs	Single Nucleotide Polymorphism
SOD	Superoxide Dismutase
SRBC	Immune Parameter
T3	Triiodothyronine
TBARS	Thiobarbituric Acid Reacting Substances
TBE	Tris-Boric-EDTA
THI	Temperature-Humidity Index
TM	Thermal Manipulation
TN	Thermoneutral
TNF	Tumor Necrosis Factor
UCP	Uncoupling Protein
VF	Village Fowl