Faculty of Science
Department of Zoology

Evaluation of the ameliorative effects of safranal and selenium on the liver damage induced by thyrotoxicosis in adult male albino rats

A Thesis

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Submitted by

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بسم الله الرحمن الرحيم

صدق الله العظيم

Dedication

To my beloved mother,

To my beloved father

To my second mother Zeinab Elfass

To my brothers,

Hussein, Tamer

To my sisters,

Rabab, Rania

To the new generation

My nephews,

Anas, Ahmed, Ali, yassein

And

To my nieces,

Mariam, Gana and Malak

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Rasha Ali Hussein Ali

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List of Abbreviations

Abbrev.	Full-term
AIF	Apoptosis-inducing factor
ALT	Alanine aminotransferase
ANOVA	analysis of variance
AST	Aspartate aminotransferase
ATP	Adenosine triphosphate
Bcl-2	B cell lymphoma
Caspases	Cysteinyl aspartate specific proteases
CAT	Catalase
DNA	Deoxyribonucleic acid
DEPC	Diethylpyrocarbonate
DPA	Diphenylamine
dNTP	Deoxyribonucleotide triphosphate
ELISA	Enzyme-linked immunosorbent assay
fT3	Free triiodothyronine
fT4	Free thyroxine
GPx	Glutathione peroxidase
GSH	Reduced glutathione
GAPDH	Glyceraldehydes-3-phosphate dehydrogenase
H_2O_2	Hydrogen peroxide
IDD	Iodothyronine deiodinases
LPO	Lipid peroxidation
L-T4	Levothyroxine
MDA	Malondialdehyde

List of Abbreviations (cont…)

Abbrev.	Full-term
NO	Nitric oxide
NOS	Nitric Oxide Synthase
NF-κB	Hepatic nuclear factor Kappa B
OS	Oxidative stress
PTP	permeability transition pores
RNS	Reactive nitrogen species
ROS	Reactive oxygen species
RT- PCR	Reverse Transcription Polymerase Chain Reaction
Se	Selenium
Smac/Diablo	Second mitochondria-derived activator of caspases/direct IAP binding protein with low pI
SOD	Superoxide dismutase
T3	Triiodothyronine
T4	Thyroxine
THs	Thyroid hormones
TSH	Thyroid stimulating hormone
TAE	Tris-acetate-EDTA
TBARS	Thiobarbituric acid reactive substances
TCA	Trichloroacetic acid
TE	Tris EDTA
TMB	Tetramethylbenzidine
TNF-α	Tumor necrosis factor

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