



Faculty of Science
Zoology Department

**Evaluation of the Hypoglycaemic, Anti-Inflammatory and
Anti-Oxidant Effects of Pomegranate (*Punica granatum* L.) Seed
and Punicalagin on a Diabetic Model of Male Albino Rats**

A Thesis

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By

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<u>LIST OF ABBREVIATIONS</u>

AAP	4-Aminophenazone
ADP	Adenosine diphosphate
ALAT	Alanine aminotransferase
AlCl₃	Aluminium chloride
AMPK	5' Adenosine monophosphate-activated protein kinase
Ang II	Angiotensin II
ANOVA	Analysis of variance
AP-1	Activator protein-1
ASAT	Aspartate aminotransferase
ATP	Adenosine triphosphate
b.w	Body weight
CAT	Catalase
CCl₄	Carbon tetrachloride
cDNA	Complementary deoxyribonucleic acid
CDNB	1-Chloro- 2, 4- dinitrobenzene
CE	Catechin equivalent
Ct	Cycle threshold
DAD	Diode array detector
DEPC-H₂O	Diethylpyrocarbonate water
D-GaIN/LPS	D-Galactosamine sensitizes animals/lipopolysaccharide
DHBS	3,5-Dichloro-2-hydroxybenzene sulfonic acid

DNA	Deoxyribonucleic acid
dNTPs	Deoxynucleotide triphosphate
DPPH•	2,2-Diphenyl-1-picrylhydrazyl
DPPH-H	Non-radical 2,2-diphenyl-1-picrylhydrazyl
DTNB	5, 5`Dithiobis (2 nitro-benzoic acid)
EDTA	Ethylene diamine tetra-acetic acid
ELISA	Enzyme-linked immunosorbent assay
FPJ	Filtrated pomegranate juice
GAPDH	Glyceraldehyde-3-phosphate dehydrogenase
GLUT	Glucose transporter
GPx	Glutathione peroxidase
GR	Glutathione reductase
GSH	Reduced glutathione
GSSG	Oxidized glutathione
GST	Glutathione-S-transferase
H₂O₂	Hydrogen peroxide
HbA0	Non-glycated haemoglobin
HbA1c	Glycated haemoglobin
HF/HS	High fat/high sucrose
HFD	High fat diet
HOMA	Homeostasis model assessment
HOMA-IR	Homeostasis model assessment- insulin resistance
HPLC	High-performance liquid chromatography

HRP	Horseradish peroxidase
i.p.	Intraperitoneal
IDDM	Insulin-dependent diabetes
IL	Interleukin
iNOS	Inducible nitric oxide synthase
IR	Insulin resistance
IRS-1	Insulin receptor substrate-1
JNK	c-Jun N-terminal kinase
LD₅₀	Lethal dose
MAPK	Mitogen-activated protein kinase
mAU	Milli absorbance unit
MDA	Malondialdehyde
MeOH	Methyl alcohol
MgCl₂	Magnesium chloride
MIT	Mitochondria
mRNA	Messenger ribonucleic acid.
NA	Nicotinamide
NAD⁺	Nicotinamide adenine dinucleotide
NADP⁺	Nicotinamide adenine dinucleotide phosphate
NADPH	Reduced form of nicotinamide adenine
NAELD	Non-alcoholic fatty liver disease
NaNO₂	Sodium nitrite
NaOH	Sodium hydroxide

NBT	Nitroblue tetrazolium
NF-κB	Nuclear factor- κ B
NIDDM	Noninsulin-dependent diabetes
NO_x	Nitric oxide
OA	Osteoarthritis
OD	Optical density
PBS	Phosphate buffer saline
PCG	Punicalagin
PMS	Phenazine methosulphate
PSJ	Pomegranate seed juice
PSO	Pomegranate seed oil
qPCR	Quantitative polymerase chain reaction
RNA	Ribonucleic acid
RNS	Reactive nitrogen species
ROS	Reactive oxygen species
rpm	Round per minute
RT-enzyme	Reverse transcriptase
RT-PCR	Reverse transcription polymerase chain reaction
SEM	Standard errors of mean
SGLT1	Sodium-dependent glucose transporter 1
SOD	Superoxide dismutase
SS	Soluble solids
STZ	Streptozotocin

T2DM	Type-2 diabetes mellitus
TBA	Thiobarbituric acid
TMB	3,3',5,5'-Tetramethylbenzidine
TNF-α	Tumour necrosis factor- α
UV	Ultraviolet
WHO	World health organization
XO	Xanthine oxidase
ZDF	Zucker diabetic fatty

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