

Assessment of Some Medicinal Egyptian Plants as a Hepatoprotective Agent

Thesis

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Presented By

Wafik Abul Ella Mohamed Al-Khayat

Under Supervision of

Prof. Dr./ Shadia Abdel Hamid Fathy

Professor of Biochemistry

Faculty of Science - Ain Shams University

Prof. Dr./ Abdel-Naser Badawi Sengab

Professor of Pharmacognosy

Faculty of Pharmacy - Ain Shams University

Prof. Dr./ Fatma Farag Abdel Hamid

Professor of Biochemistry

Faculty of Science - Ain Shams University

Dr./ Naglaa Ahmed Samir Awad

Ass. Professor of Pathology

Faculty of Medicine - Ain Shams University

Faculty of Science
Ain Shams University
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لجنة الإشراف:

- (1) أ.د. / شادية عبد الحميد فتحى أستاذ الكيمياء الحيوية
بكلية العلوم - جامعة عين شمس
(2) أ.د. / عبد الناصر بدوي سنجاب أستاذ العقاقير الطبية
كلية الصيدلة - جامعة عين شمس
(3) أ.د. / فاطمة فرج عبدالحميد أستاذ الكيمياء الحيوية
كلية العلوم - جامعة عين شمس
(4) أ.د. / نجلاء أحمد سمير عوض أستاذ علم الأمراض المساعد
كلية الطب - جامعة عين شمس

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Approval Sheet

Name of Candidate: **Wafik Abul Ella Mohamed Al-Khayat**

This thesis has been approved for submission by:

1- Prof. Dr./ Shadia Abdel Hamid Fathy

Professor of Biochemistry

Faculty of Science - Ain Shams University

Signature

2- Prof. Dr./ Abdel-Naser Badawi Sengab

Professor of Pharmacognosy

Faculty of Pharmacy - Ain Shams University

Signature

3- Prof. Dr./ Fatma Farag Abdel Hamid

Professor of Biochemistry

Faculty of Science - Ain Shams University

Signature

4- Prof. Dr./ Naglaa Ahmed Samir Awad

Ass. Professor of Pathology

Faculty of Medicine - Ain Shams University

Signature

***Chairman of Department of Biochemistry
Faculty of Science, Ain Shams University***

Prof. Dr. Amr Karim

جامعة عين شمس
كلية العلوم

شكر

أشكر السادة الأساتذة الذين قاموا بالإشراف وهم:

(1) أ.د. / شادية عبد الحميد فتحى أستاذ الكيمياء الحيوية
بكلية العلوم - جامعة عين شمس

(2) أ.د. / عبد الناصر بدوي سنجاب أستاذ العقاقير الطبية
كلية الصيدلة - جامعة عين شمس

(3) أ.د. / فاطمة فرج عبدالحميد أستاذ الكيمياء الحيوية
كلية العلوم - جامعة عين شمس

(4) أ.د. / نجلاء أحمد سمير عوض أستاذ علم الأمراض المساعد
كلية الطب - جامعة عين شمس

كما أتقدم بالشكر إلى: قسم الكيمياء الحيوية - كلية العلوم - جامعة عين شمس.

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I declare that this thesis has been composed by myself and that the work of which is a record has been done by myself. It has not been submitted for a degree at this or any other university.

Wafik Abul Ella Mohamed Al-Khayat

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ABSTRACT

The vast majority of people on this planet still rely on their traditional material medica (medicinal plants and other materials) for their everyday health care needs. It is also a fact that one quarter of all medical prescriptions are formulations based on substances derived from plants or plant-derived synthetic analogs, and according to the WHO, 80% of the world's population, primarily those of developing countries, rely on plant-derived medicines for their healthcare.

The current study was conducted to assess the hepatoprotective activity of some medicinal antioxidant plants against carbon tetrachloride (CCl₄) intoxication in liver albino rats. *Centaurea aegyptiaca*, red and yellow carrot were the medicinal antioxidant plants of choice in the present study.

In the present study, 144 adult male albino rats, weighing from 150-200 gm, were classified into two main groups. Group A (normal control group) and group B (liver injured group). **Group A:** 24 rats were left to serve as normal basic controls and were subclassified into four subgroups (A1, A2, A3 & A4).

Group B: 120 rats were administered with CCl₄ in a dose of 1 mL/kg twice a week for 5 weeks and were divided into 4 subgroups: **Group B1:** treated with CCl₄ (+v) control, **Group B2:** treated with *Centaurea aegyptiaca* + CCl₄, **Group B3:** treated with red carrot + CCl₄ and **Group B4:** treated with yellow carrot + CCl₄. The results of the current study revealed

that the mean serum levels of AST, ALT, LDH, and GGT of carbon tetrachloride (CCl₄) treated (+ve) control group are highly significantly ($p < 0.01$) increased compared to that of untreated (-ve) control groups along the study duration. Meanwhile, the mean serum levels of AST, ALT, LDH, and GGT of *Centaurea aegyptiaca* protected groups are highly significantly ($P < 0.01$) decreased compared to that of CCl₄ treated (+ve) control group. In the red and yellow carrot groups, the mean serum levels of AST, ALT, LDH, and GGT ranged between significant ($P < 0.05$) and highly significant ($P < 0.01$) decrease compared to that of carbon tetrachloride (CCl₄) treated (+ve) control.

On the other hand, the mean serum level of AChE activities of *Centaurea aegyptiaca*, red and yellow carrot protected groups are highly significantly ($p < 0.01$) increased compared to the carbon tetrachloride (CCl₄) treated group throughout the study duration.

In conclusion, the selected medicinal plants (*Centaurea aegyptiaca*, red carrot and yellow carrot) have efficient hepatoprotective effect against carbon tetrachloride (CCl₄) hepatotoxicity.

Further studies are needed to identify and characterize the entire spectrum of mediators that energize the antioxidant effects of these plants specially on the cellular and molecular levels.

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List of Abbreviations

O_2^-	Superoxide radical
AChE	Acetylcholinestrerase
ALT	Alanine aminotransferase
ASH	alcoholic steatohepatitis
AST	Aspartate aminotransferase
AVED	Ataxia and vitamin E deficiency
B[a]P	Benzo [a] pyrene
Ca^{++}	Calcium
CAH	Chronic active hepatitis
CCK	Cholecystokinin
CCl_3	Trichloromethyl radical
CCl_4	Carbon tetrachloride
C-I	Type I Collagen
C-II	Type II Collagen
C-III	Type III Collagen
CP	Ceruloplasmin
Cu	Copper
Fe	Iron
FLD	Fatty liver disease
GGT	Gamma glutamyl transferase
GLDH	Glutamate dehydrogenase
GSHPx	Glutathione Peroxidase
GSSG	Oxidized glutathione
GST	Glutathione S-Transferase

H₂O₂	Hydrogen Peroxide
HOCl	Hypochlorous Acid
ICDH	Iso-citrate dehydrognase
LOOH	Lipid hydroperoxide
MRP	Multidrug Resistance Protein
NAD	Nicotineamide adenine dinucleotide
NADH	Reduced B-nicotinamide adenine dinucleotide
NASH	Non-Alcoholic Steatohepatitis
Ni	Nickel
NiCl₂	Nickel chloride
OH	Hydroxyl Radical
PBL	peripheral blood lymphocytes
PBS	Phosphate-buffered saline
PCBS	Polychlorinated biphenyls
Q₀⁻	Conenzyme Q ₀
ROS	Reactive oxygen species
SDS	Sodium dodecyl sulfate
SLE	Systemic Lupus Erythematosus
SODs	Superoxide Dismutases
SSB	Single Strand Break
TE	Tris EDTA buffer
UQ	Ubiquinone

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