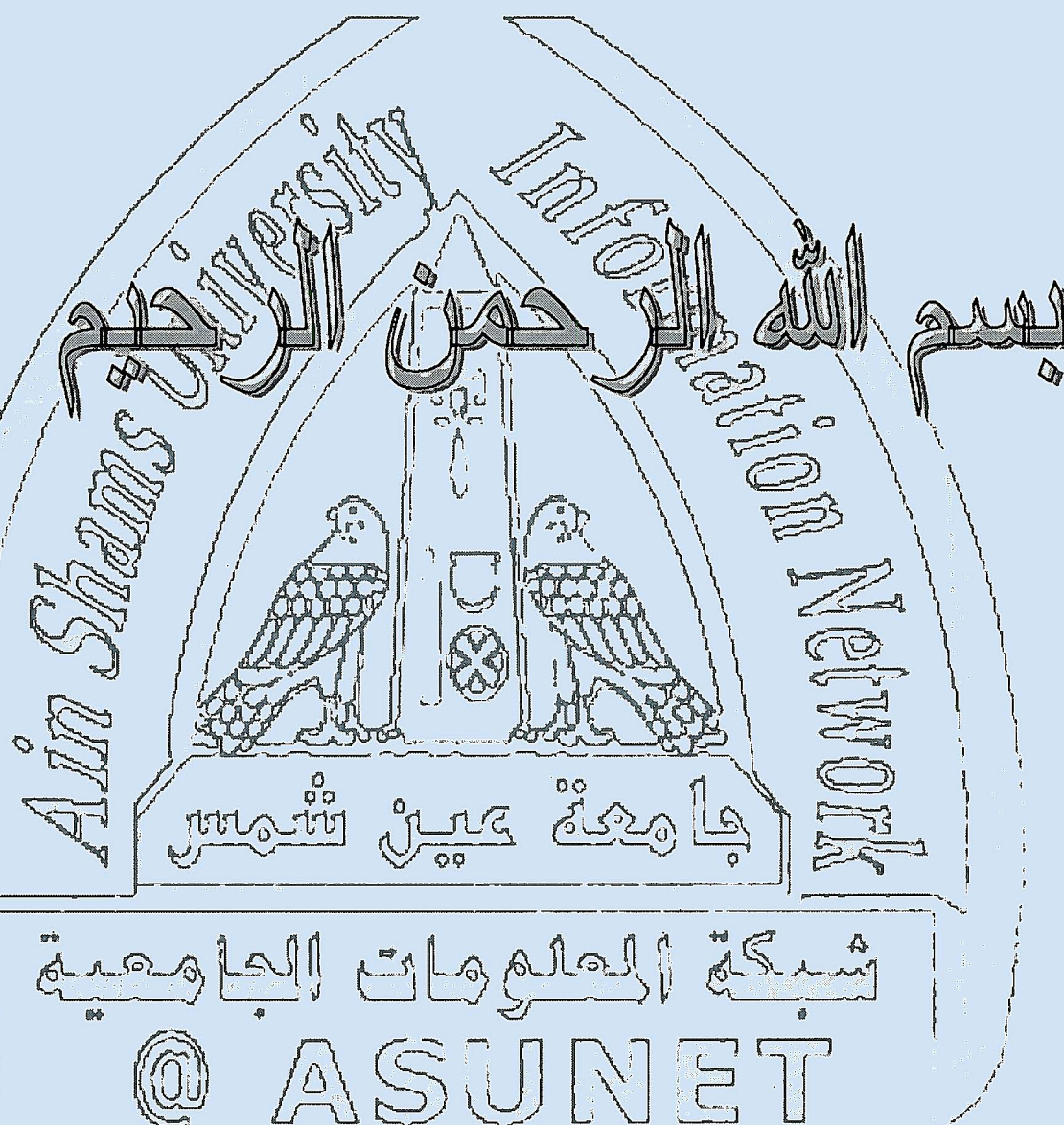




شبكة المعلومات الجامعية



# جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

## قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها  
على هذه الأفلام قد أعدت دون أية تغييرات



## يجب أن

تحفظ هذه الأفلام بعيدا عن الغبار

في درجة حرارة من ١٥-٢٥ مئوية ورطوبة نسبية من ٢٠-٤٠%

To be Kept away from Dust in Dry Cool place of  
15-25- c and relative humidity 20-40%





# شبكة المعلومات الجامعية التوثيق الالكتروني والميكروفيلم

# بعض الوثائق الأصلية تالفة

**A PHYSIOLOGICAL STUDY TO EVALUATE THE  
ANTIOXIDATIVE ACTIVITY OF QUERCETIN AGAINST  
THE ISONIAZID-INDUCED ADVERSE REACTIONS IN  
MALE ALBINO RATS**

**A THESIS**

Submitted For the Ph. D. Degree in Zoology  
(Comparative Physiology)

Presented By

***Ghada Mohammed Abul-Fotouh Mohammed Adly***

(M. Sc. in Zoology)

Faculty of Science

Cairo University

2011

512136





**Cairo University**  
**Faculty of Science**  
**Department of Zoology**

## **APPROVAL SHEET**

**Title of the PhD Thesis**

**A Physiological study to evaluate the antioxidative activity of quercetin against the isoniazid-induced adverse reactions in male albino rats.**

**Name of the Candidate:**

***Ghada Mohammed Abul-Fotouh***

**Submitted to:**

**Faculty of Science, Cairo University**

**Supervision Committee:**

**1- Professor Dr. Osama Abdel-Ghaffar Youssef**

**Professor of Comparative Physiology**

**Zoology Department, Faculty of Science, Cairo University**

**2- Professor Dr. Salwa Thabet Mahmoud**

**National Organization for Drug Control and Research, Giza, Egypt**

**Head of Zoology Department**

***Professor Dr. Abdel-Rahman Bashtar***





## ABSTRACT

**Student Name:** Ghada Mohammed Abul-Fotouh Mohammed

**Title of the thesis:** A Physiological study to evaluate the antioxidative activity of quercetin against the isoniazid-induced adverse reactions in male albino rats.

**Degree:** PhD (Comparative Physiology)

The daily administration of INH to the male albino rats for five weeks caused a marked anemia evidenced with reduced red cell count, packed cell volume and hemoglobin content. It was assorted as macrocytic hypochromic anemia, due to the oxidative stress of INH on the red cell membranes. Also, INH treatment resulted in a reduction in the total leukocyte count. As regards the biochemical parameters, INH treatment caused significant decrements in the levels of serum glucose, total protein, albumin, and HDL-cholesterol. Nevertheless, there were marked increments in the levels of serum total cholesterol, LDL-cholesterol, triglycerides and uric acid, as well as in the activities of serum aspartate aminotransferase (ASAT), alanine aminotransferase (ALAT), and alkaline phosphatase (ALP). Regarding the markers of the oxidative stress, the serum malondialdehyde (MDA) levels were increased while the reduced glutathione (GSH) content and superoxide dismutase (SOD) activity were decreased in liver of INH-treated rats. All the INH-induced hematological and biochemical alterations were markedly ameliorated in the animal group treated with Qc prior to INH. Furthermore, no side effects were observed in animal group treated with Qc alone.

**Keywords:** Isoniazid, Quercetin, Physiology, Hematology.

Supervisors:

Signature:

1- Prof. Dr. Osama Abdel-Ghaffar Youssef

2- Prof. Dr. Salwa Thabet Mahmoud

*Osama Abdel-Ghaffar*  
*Salwa Thabet*

Prof. Dr. Abdel-Rahman Bashtar

Chairman of Zoology Department  
Faculty of Science- Cairo University



*To whom I love very much  
and I am in debt to them for my  
happiness in this life: my great parents,  
lovely sisters and faithful husband.*



## **ACKNOWLEDGEMENT**

*The first and foremost thanks are due to God, the most beneficent and merciful.*

*I would like to express my great appreciation to Professor Dr. Osama Abdel-Ghaffar, Professor of Comparative Physiology, Zoology Department, Faculty of Science, Cairo University, for his suggesting the point, planning the work, instructive guidance and valuable remarks. I am always thankful for his kind and tremendous assistance, valuable time and help.*

*Also, my appreciation and gratitude to Professor Dr. Salwa Thabet Mahmoud, Professor of Physiology, National Organization for Drug Control and Research (NODCAR), for her great efforts, care and valuable support to produce and present this thesis. Her continuous supervision and encouragement were of great value throughout the course of this work.*

*My deep acknowledgements are also due to the dear professors and colleagues in the Department of Zoology, Faculty of Science, Cairo University and in the Department of Physiology, National Organization for Drug Control and Research (NODCAR) for their helpful guidance and valuable assistance.*





---

## CONTENTS

<b>INTRODUCTION .....</b>	<b>1</b>
<b>MATERIALS AND METHODS .....</b>	<b>11</b>
<b>ANALYTICAL TECHNIQUES .....</b>	<b>14</b>
<b>I. Hematological Parameters .....</b>	<b>14</b>
I.1. Enumeration of erythrocytes .....	14
I.2. Determination of hematocrit .....	14
I.3. Determination of hemoglobin content .....	14
I.4. Calculation of red cell indices. ....	15
I.5. Enumeration of leukocytes.....	16
<b>II. Biochemical Parameters.....</b>	<b>16</b>
II.1. Determination of serum glucose concentration.....	16
II.2. Determination of serum cholesterol concentration.....	17
II.3. Determination of serum HDL- and LDL-cholesterol .....	18
II.4. Determination of serum triglyceride concentration.....	19
II.5. Determination of total protein concentration in serum .....	20
II.6. Determination of serum albumin concentration.....	20
II.7. Determination of serum globulin concentration.....	21
II.8. Determination of serum urea concentration.....	21
II.9. Determination of serum uric acid concentration.....	22
II.10. Determination of serum creatinine concentration.....	22
II.11. Determination of lipid peroxidation in serum .....	23
II.12. Determination of reduced glutathione concentration in liver.....	24
II.13. Determination of serum aspartate aminotransferase activity.....	25
II.14. Determination of serum alanine aminotransferase activity .....	26
II.15. Determination of serum alkaline phosphatase activity.....	27
II.16. Determination of superoxide dismutase activity in liver .....	28
<b>IV. STATISTICAL ANALYSIS .....</b>	<b>30</b>
<b>RESULTS .....</b>	<b>31</b>
I. The Hematological Study .....	31
II. The Biochemical Study .....	51