

صفاء أبو السعود محمد



شبكة المعلومات الجامعية

# بسم الله الرحمن الرحيم



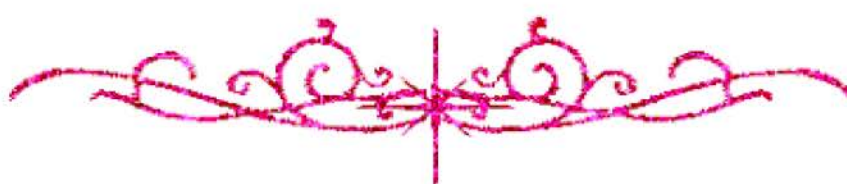
صفاء أبو السعود محمد



شبكة المعلومات الجامعية



# شبكة المعلومات الجامعية التوثيق الالكتروني والميكرو فيلم



صفاء أبو السعود محمد



شبكة المعلومات الجامعية

# جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

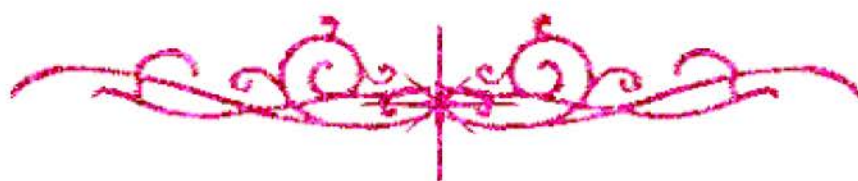
## قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها  
علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات



## يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار



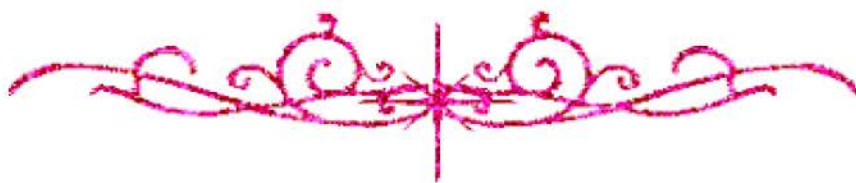
صفاء أبو السعود محمد



شبكة المعلومات الجامعية



# بعض الوثائق الأصلية تالفة



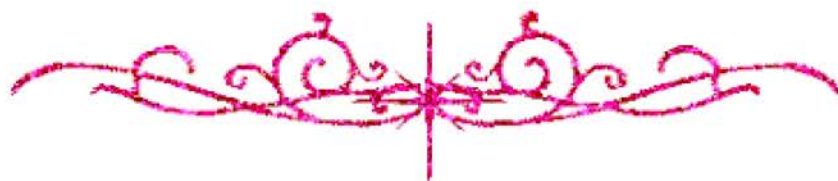
صفاء أبو السعود محمد



شبكة المعلومات الجامعية



بالرسالة صفحات  
لم ترد بالأصل



# **Biochemical study on mammalian ovarian follicular fluids**

**Thesis**

**Submitted to the Institute of Graduate Studies and Research**

**in Partial Fulfillment of the Requirements**

**for M. Sc. Degree in  
Bioscience & Technology**



**BY**

**Hany Salah baker El Gendy**

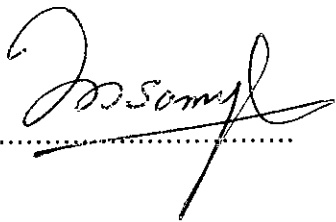
**B. Sc. Science (Biochemistry/Chemistry), 1995**

**Department of Bioscience & Technology  
Institute of Graduate Studies and Research  
University of Alexandria**

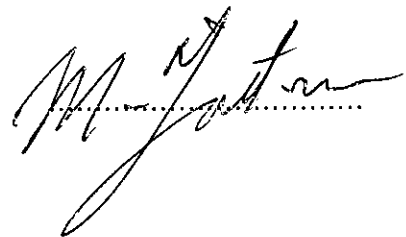
**2003**


# Biochemical study on mammalian ovarian follicular fluids

APPROVED

  
.....

  
.....

  
.....

  
.....

Date     /     / 2003

Alexandria, Egypt.

## **SUPERVISORS**

### **Dr. Moustafa M. Zeitoun**

Professor of Animal Physiology,  
Department of Animal Production,  
Faculty of Agriculture,  
University of Alexandria.

### **Dr. Mokhtar Ibrahim Yousef**

Associate Professor of Environmental Animal Physiology,  
Department of Environmental Studies,  
Institute of Graduate Studies and Research,  
University of Alexandria .

## ACKNOWLEDGMENTS

First of all, I thank **ALLAH** for helping me to accomplish this study which touch one of the most sensitive issues in our daily life (i.e.. meat & milk consumption) and for providing me with such very encouraging and supporting supervisors.

I would like to express my great appreciation to **Dr. Moustafa Mohamed Zeitoun**, Professor of Animal Physiology, Department of Animal Production, Faculty of Agriculture, Alexandria University, for devoting much of his time and effort in supervision of this thesis, guidance, useful criticism during preparation of this work, and reviewing the manuscript.

I would like to express my deep gratitude to **Dr. Mokhtar Ibrahim Yousef**, Associate Prof. of Environmental Animal Physiology, Department of Environmental Studies, Institute of Graduate Studies and Research, University of Alexandria, for his advice, encouragement, and his assistance during the preparation of the thesis, and reviewing the manuscript.

Great appreciation should go to Dr. Elsyed El Agamy, Professor of Dairy chemistry, Faculty of Agriculture, University of Alexandria, for devoting his time, and providing facilities to accomplish the electrophoresis part of this study.

Deep appreciation is due to Dr. Taha Zaghloul, Professor of Bioscience and Technology for his continuous encouragement and help.

Thanks are also due to **My big family Mother, Father, and Brothers** for their assistance and prayers all the time for me.

I wish also to thank my lab.'s colleagues for their help in the laboratory tests and experimental procedures specially **Mr. Alaa Fathy and Mr. Sabry Farag.**

I wish to express my gratitude to my fiancée **Miss. Sanaa Aly El Gendy** for her continual efforts for me and her help. She was behind me all the time, so I finished my thesis.

# CONTENTS

	Page
List of Tables .....	i
List of Figures .....	iii
List of Photo .....	vi
List of Abbreviations .....	vii
<b>1. INTRODUCTION.....</b>	<b>1</b>
<b>2. AIM OF THE WORK.....</b>	<b>2</b>
<b>3. REVIEW OF LITERATURE.....</b>	<b>3</b>
3.1. Follicular fluid.....	3
3.2. Progesterone.....	4
3.2.1. Chemistry, biosynthesis and metabolism of progesterone.....	4
3.2.2. Progesterone secretion.....	5
3.2.3. Progesterone action.....	5
3.3. Total protein and albumin.....	6
3.4. Enzyme activity.....	7
3.4.1. Transferases.....	7
3.4.2. Alkaline phosphatase (AIP).....	8
3.4.3. Acid phosphatase (AcP).....	8
3.4.4. Lactate dehydrogenase (LDH).....	9
3.4.5. Glutathion S-Transferase (GST).....	10
3.5. Lipids and their derivatives.....	11
3.6. Minerals (Na, K, Mg, Se, Zn, Cu, Fe).....	12
3.7. Follicular fluids free radicals.....	16
<b>4. MATERIALS AND METHODS</b>	
4.1. Slaughterhouse ovarian collection.....	18
4.2. Ovarian classification.....	18
4.3. Follicular fluids aspiration.....	19
4.4. Biochemical characteristics.....	20
4.5. Mineral determination.....	21
4.6. Progesterone determination.....	21
4.7. Total free radicals determination.....	21
4.8. Protein pattern and sodium dodecyle sulfate polyacrylamide gel electroporesis (SDS-PAGE).....	22
4.9. Statistical analysis.....	25

## **5. RESULTS AND DISCUSSION**

<b>5.1.</b>	Biochemical and physiological differences between single, double-ovulated and cystic ovaries of buffalo.....	26
5.1.1.	Slaughtered buffalo cows.....	26
5.1.2.	Morphological and anatomical differences among buffalo ovarian physiological status.....	34
5.1.3.	Biochemical components of ovarian follicular fluids in single, double and cystic ovaries.....	41
5.1.3.1.	Proteins and glucose.....	41
5.1.3.2.	Lipids and their derivatives.....	44
5.1.3.3.	Enzyme activities.....	50
5.1.3.4.	Follicular fluid progesterone.....	56
5.1.3.5.	Follicular fluid free radicals.....	57
<b>5.2.</b>	Biochemical and physiological aspects of follicles in single-ovulated buffalo ovaries.....	58
5.2.1.	Proteins and glucose.....	58
5.2.2.	Lipids and their derivatives.....	62
5.2.3.	Enzyme activities.....	62
5.2.4.	Follicular fluid progesterone.....	70
5.2.5.	Follicular fluid free radicals.....	71
5.2.6.	Follicular fluid minerals.....	73
<b>5.3.</b>	Biochemical and physiological aspects of follicles in double-ovulated buffalo ovaries.....	80
5.3.1.	Proteins and glucose.....	80
5.3.2.	Lipids and their derivatives.....	83
5.3.3.	Enzyme activities.....	87
5.3.4.	Follicular fluid progesterone.....	91
5.3.5.	Follicular fluid free radicals.....	91
<b>5.4.</b>	Biochemical and physiological aspects of follicles in cystic buffalo ovaries.....	93
5.4.1.	Proteins and glucose.....	93
5.4.2.	Lipids and their derivatives.....	96
5.4.3.	Enzyme activities.....	100
5.4.4.	Follicular fluid progesterone.....	104
5.4.5.	Follicular fluid free radicals.....	104

<b>5.5.</b>	Protein pattern and sodium dodecyle sulphate polyacrylamid gel electrophoresis (SDS-PAGE) of buffalo ovarian FF.....	106
5.5.1.	Protein pattern of small follicle in buffalo ovarian follicular fluids with different fertility status.....	106
5.5.2.	Protein pattern of medium follicle in buffalo ovarian follicular fluids with different fertility status.....	108
<b>6.</b>	<b>SUMMARY AND CONCLUSION</b>	110
<b>7.</b>	<b>REFERENCES</b>	115
<b>8.</b>	<b>ARABIC SUMMARY</b>	

## List of Tables

## Page

Table 1.	Distribution of buffalo ovaries according to their different follicular population per pair of ovary.....	27
Table 2.	Distribution of buffalo ovaries according to their morphological structures.....	29
Table 3	Morphological differences among buffalo ovarian physiological status (single ovulated, double ovulated and cystic ovaries).....	38
Table 4.	Effect of buffalo ovarian physiological status on total proteins, albumin, globulin and glucose concentrations of follicular fluids.....	42
Table 5.	Effect of buffalo ovarian physiological status on total lipids, HDL, cholesterol, triglycerides, VLDL and LDL concentrations of follicular fluids.....	45
Table 6.	Effect of buffalo ovarian physiological status on some enzyme activities of follicular fluids.....	52
Table 7.	Effect of buffalo ovarian physiological status on progesterone and total free radical concentrations of follicular fluids.....	56
Table 8.	Effect of follicle size of normal single-ovulated Buffalo ovaries on total proteins, albumin, globulin and glucose concentrations of follicular fluids.....	60
Table 9.	Effect of follicle size of normal single-ovulated Buffalo ovaries on concentrations of total lipids, HDL, cholesterol, triglycerides, VLDL and LDL in follicular fluids.....	64
Table 10.	Effect of follicle size of normal single-ovulated Buffalo ovaries on some enzyme activities of follicular fluids.....	65
Table 11.	Effect of follicle size of normal single-ovulated Buffalo ovaries on progesterone and total free radicals concentrations of follicular fluids.....	72
Table 12.	Concentrations of some minerals in different sizes of buffalo ovarian follicular fluids.....	74
Table 13.	Effect of follicle size of double ovulated Buffalo ovaries on total proteins, albumin, globulin and glucose concentrations of follicular fluids.....	81
Table 14.	Effect of follicle size of double-ovulated Buffalo ovaries on concentrations of total lipids, HDL, cholesterol, triglycerides, VLDL and LDL in follicular fluids.....	84

Table 15.	Effect of follicle size of double ovulated Buffalo ovaries on some Effect of follicle size of double ovulated Buffalo ovaries on some enzyme activities in follicular fluids.....	88
Table 16.	Effect of follicle size of double ovulated Buffalo ovaries on progesterone and total free radicals concentrations of follicular fluids.....	92
Table 17.	Effect of follicle size of cystic ovulated Buffalo ovaries on total proteins, albumin, globulin and glucose concentrations of follicular fluids.....	94
Table 18.	Effect of follicle size of cystic ovulated Buffalo ovaries on concentrations of total lipids, HDL, cholesterol, triglycerides, VLDL and LDL in follicular fluids.....	97
Table 19.	Effect of follicle size of cystic ovulated Buffalo ovaries on some enzyme activities of follicular fluids.....	101
Table 20.	Effect of follicle size of cystic ovulated Buffalo ovaries on progesterone and total free radicals concentrations of follicular fluids.....	105