

# 







شبكة المعلومـــات الجامعية التوثيق الالكتروني والميكروفيا.



# جامعة عين شمس

التوثيق الالكتروني والميكروفيلم



نقسم بللله العظيم أن المادة التي تم توثيقها وتسجيلها على هذه الأفلام قد اعدت دون آية تغيرات



## يجب أن

تحفظ هذه الأفلام بعيداً عن الغبار

40-20 في درجة حرارة من 15-20 منوية ورطوبة نسبية من

To be kept away from dust in dry cool place of 15 – 25c and relative humidity 20-40 %

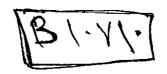












# Study on some heavy metals residues in Nile fish in Qena Governorate

#### **THESIS**

Presented By
Atif Ahmed Aly Metwally
B.V.Sc. Assiut Univ. (1985)

### Supervised by

#### Dr. Hussein Youssef Ahmed

Prof. of Meat Hygiene and Fish & their Product, Dept. of Food Hygiene Faculty of Veterinary Medicine,
Assiut University

#### **Dr. Ahmed Mohamed Nasar**

Prof. of Meat Hygiene and Fish & their Product, Dept. of Food Hygiene, Faculty of Vet. Med.,

Assiut University

#### Dr. Abdel-Latif Shaker Seddek

Prof. of Forensic Medicine & Toxicology
Vice dean for Post Graduate Studies &
Scientific Research
Faculty of Vet. Med., South Valley University

For Degree of (M.V.Sc.)

Hygiene and Control of Meat, Fish and their Products
and by products and Animal by-products

Faculty of Veterinary Medicine

Assiut University

Assiut University
Faculty of Vet. Medicine
Dept. of Food Control

## **Approval Sheet**

This is to approve that the dissertation presented by Atif Ahmed Aly Metwaly to Assiut University entitled "Study on some heavy metals residues in Nile fish in Qena Governorate" for the degree of (M.V.Sc.) Meat Hygiene and Fish has been approved in 27/10/2007 by the examining Committee:

#### Member:

1- Prof. Dr. Yahia Abd El-Padee Hefnaway
Prof. of Meat & Fish Hygiene, Food Control
Department, Faculty of Vet. Med., Assiut University

(Member)

YHefnawy

2- Prof. Dr. Nabil Abd El-Gapper Yassen

Prof. of Meat & Fish Hygiene, Food Control Department, Faculty of Vet. Med., Cairo University (Member)

3- Prof. Dr. Hussein Youssef Ahmed

Prof. of Meat & Fish Hygiene, Food Control
Department, Faculty of Vet. Med., Assiut University

(Member & Supervisor)

4- Prof. Dr. Ahmed Mohamed Nassar

Prof. of Meat & Fish Hygiene, Food Control
Department, Faculty of Vet. Med., Assiut University

(Member &

Supervisor)

Approved by the Faculty Council: / /2007

" بسم الله الرحمن الرحيم "
{وَمَا يَسْتَوِي الْبَحْرَانِ هَذَا عَذْبٌ فُرَاتٌ سَائِغٌ شَرَابُهُ
وَهَذَا مِلْحٌ أُجَاحٌ وَمِن كُلِّ تَأْكُلُونَ لَحْماً طَرِيّاً
وَتَسْتَخْرِجُونَ حِلْيَةً تَلْبَسُونَهَا وَتَرَى الْفُلْكَ فِيهِ
مَوَاخِرَ لِتَبْتَغُوا مِن فَصْلِهِ وَلَعَلَّكُمْ تَشْكُرُونَ }
مواخِرَ لِتَبْتَغُوا مِن فَصْلِهِ وَلَعَلَّكُمْ تَشْكُرُونَ }
صدق الله العظيم
صدة الله العظيم

# Dedicated to My Mother

# ACKNOWLEDGMENTS

#### **ACKNOWLEDGEMENT**

#### Firstly thanks to my God

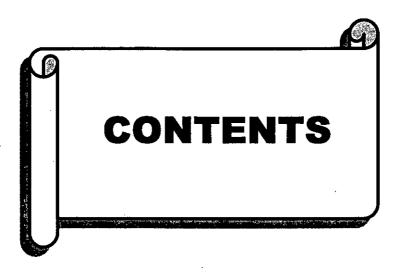
I would like to express my great gratitude to *Prof. Dr. Hussein Youssef Ahmed*, Professor of Meat Hygiene, Faculty of Vet. Med., Assiut University, for his useful suggestions, valuable guidance and generous advice.

I wish to express m y deep grateful appreciation and thanks to **Prof. Dr. Ahmed Mohamed Nassar**, Professor of Meat Hygiene, Faculty of Vet. Med., Assiut University, for his advice and helpful suggestion.

I am greatly acknowledge the valuable help and supervision of *Prof. Dr. Abdel-Latif Shaker Seddek*, Professor of Forensic Medicine & Toxicology, Faculty of Vet. Med., South Valley University.

I wish to express my deepest appreciation to *Prof. Dr. Hosney* Ali Hassan, Professor of Biochemistry, Faculty of Medicine, Assiut University, for his advice and helpful suggestion.

My gratitude is also for all members of Dept. of Food Hygiene and Dept. of Forensic Medicine and Toxicology, Faculty of Vet. Med., Assiut University.



# **CONTENTS**

	Page
Introduction	1
Review of Literature	5
Materials and Methods	47
Results	51
Discussion	67
Conclusion and Recommendation	77
Summary	79
References	82
Appendix	97
Arabic Summary	

### **LIST OF TABLES**

Table No.	Title	Page
1	Statistical analytical results of Cadmium levels (ppm) in <i>T. nilotica</i> fish caught from different districts.	51
2	Analysis of variance (ANOVA) comparing for Cadmium (Cd) levels (ppm) wet weight in the examined <i>T. nilotica</i>	
3	fish in different districts.  Statistical analytical results of Cadmium "Cd" (ppm) wet	51
	weight in C. lazera fish caught from different districts.	52
4	Analysis of variance (ANOVA) comparing for Cadmium	
	(Cd) levels (ppm) wet weight in the examined C. lazera	
	fish in different districts.	52
5	Statistical analytical results of Lead levels (ppm) in $T$ .	
	nilotica fish caught from different districts.	54
6	Analysis of variance (ANOVA) comparing for Lead (pb)	
	levels (ppm) wet weight in the examined T. nilotica fish	
	in different districts.	54
7	Statistical analytical results of Lead "pb" (ppm) wet	
	weight in C. lazera fish caught from different districts.	55
8	Analysis of variance (ANOVA) comparing for Lead (pb)	
	levels (ppm) wet weight in the examined C. lazera fish	
	in different districts.	55
9	Statistical analytical results of Copper levels (ppm) in <i>T. nilotica</i> fish caught from different districts.	57
10	Analysis of variance (ANOVA) comparing for Copper	
	(Cu) levels (ppm) wet weight in the examined <i>T. nilotica</i>	
	fish in different districts.	57
11	Statistical analytical results of Copper (Cu) (ppm) wet	
	weight in C. lazera fish caught from different districts.	58
12	Analysis of variance (ANOVA) comparing for Copper	
	"Cu" levels (ppm) wet weight in the examined C. lazera	
	fish in different districts.	58
13	Statistical analytical results of Zinc levels (ppm) in T.	
	nilotica fish caught from different districts.	60
14	Analysis of variance (ANOVA) comparing for Zinc (Zn)	· ·····
	levels (ppm) wet weight in the examined T. nilotica fish	
	in different districts.	60

# LIST OF TABLES (Cont.)

Table	m'u	
No.	Title	Page
15	Statistical analytical results of Zinc (Zn) levels (ppm)	
	wet weight in C. lazera fish caught from different	
	districts.	61
16	Analysis of variance (ANOVA) comparing for Zinc (Zn)	
	levels (ppm) wet weight in the examined C. lazera fish	
	in different districts.	61
17	Percentage of the examined fish (T. nilotica and C.	
	lazera) samples according to the permissible limits of	
	certain heavy metal levels "Pb, Cd, Cu and Zn).	63
18	Statistical analysis for the least significant difference	
	(LSD) between heavy metals in T. nilotica fish and	
	different districts.	64
19	Statistical analysis for the least significant difference	
	(LSD) between heavy metals in C. lazera fish and	
	different districts.	64
20	Comparison between contaminated of T. nilotica and C.	
	lazera by heavy metals using (levene's test) for equality	
	of variances and t-test for equality of means.	65
21	Correlation coefficient between heavy metals in T.	
	nilotica in Qena governorate	65
22	Correlation coefficient between heavy metals in C.	•
	lazera in Qena governorate	65