

# بسم الله الرحمن الرحيم





# شبكة المعلومات الجامعية التوثيق الالكتروني والميكرو فيلم



# 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



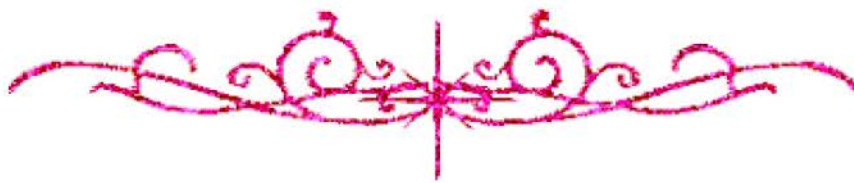
## يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار



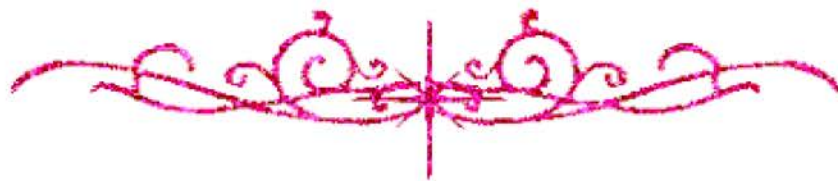


# بعض الوثائق الأصلية تالفة





بالرسالة صفحات  
لم ترد بالأصل



# Studies On Edwardseilosis In Some Cultured Freshwater Fish

*A Thesis*

Presented to the Graduate School  
Faculty of Veterinary Medicine, Alexandria  
University

In Partial fulfillment of the  
Requirements for the Degree

*Of*

Doctor of philosophy of Veterinary Sciences

*specialization*

( Fish Disease and Hygiene )

*By*

Naglaa Fathy Mohamed Galal

*January 2008*

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

# وما أوتيتم من العلم إلا قليلاً

صدق الله العظيم

سورة الإسراء الآية رقم ٨٥

# Studies On Edwardseilosis In Some Cultured Freshwater Fish

*A Thesis*

Presented to the Graduate School  
Faculty of Veterinary Medicine, Alexandria  
University

In Partial fulfillment of the  
Requirements for the Degree

*Of*

Doctor of philosophy of Veterinary Sciences

*specialization*

( Fish Disease and Hygiene )

*By*

Naglaa Fathy Mohamed Galal

*January 2008*

## ADVISORS' COMMITTEE :

**Prof. Dr. Magdy Khalil Soliman**

Prof. of Fish Diseases and Hygiene

And

vice dean of the faculty of veterinary medicine

Department of Poultry and Fish diseases

Magdy K. Soliman  
Faculty of Veterinary Medicine  
Alex. Univ. Damanhour branch

**Dr . Riad Hassan Khalil**

Assoc. Prof. of fish Disease and Hygiene

Department of Poultry and Fish diseases

Faculty of Veterinary Medicine

Alex. Univ.

Riad K

## ADVISORS' COMMITTEE :

**Prof. Dr. Magdy Khalil Soliman**

Prof. of Fish Diseases and Hygiene

And

vice dean of the faculty of veterinary medicine

Department of Poultry and Fish diseases

Magdy K. Soliman  
Faculty of Veterinary Medicine  
Alex. Univ. Damanhour branch

**Dr . Riad Hassan Khalil**

Assoc. Prof. of fish Disease and Hygiene

Department of Poultry and Fish diseases

Faculty of Veterinary Medicine

Alex. Univ.

Riad K

## Approval sheet

Approval sheet for the thesis presented by "*Naglaa Fathy Mohamed Galal* " for the degree of "Ph.D." in the Fish Disease and Hygiene branch from Faculty of Veterinary Medicine Alexandria University.

Signature

Members:

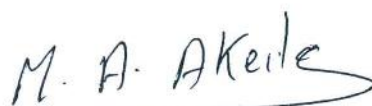
*Prof. Dr. Ismaele Abd El-Monem Eissa*

Professor of Fish Disease and Management,  
fac. Vet. Med. Ismaelia, Suiz canal Univ.



*Prof. Dr. Mohammed Ali Akiela*

Prof. of Microbiology and  
Head of the Dept. of Microbiology  
Faculty of Vet. Med. Alex. Univ.



*Prof. Dr. Magdy Khalil Soliman*

Prof. of Fish Diseases and Hygiene  
vice dean of the faculty of veterinary medicine  
Department of Poultry and Fish diseases  
Faculty of Veterinary Medicine  
Alex. Univ. Damamhour branch (Supervisor).



# **ACKNOWLEDGEMENT**

## ACKNOWLEDGEMENT

*First of all prayerful thanks to Allah who gives me every thing I have.*

*I am greatly indebted to **Prof. Dr. Magdy Khalil Soliman***

*Prof. of Fish Diseases and Hygiene And vice dean of the faculty of veterinary medicine Department of Poultry and Fish diseases Faculty of Veterinary Medicine Alex. Univ. Damanhour branch  
for his stimulating supervision, for valuable and continuous share and interest encouragement.*

*Special thanks and full appreciation are due to **Dr. Riad Hassan Khalil***

*Assoc. Prof. of fish Disease and Hygiene, Department of Poultry and Fish diseases Faculty of Veterinary Medicine, Alex. Univ. for his help and post-graduate studies researches , direct and effective advises during the course of this study.*

*Also , special thanks for **Dr. Talaat Talaat Saad**, Lecturer of fish Disease and Hygiene, Faculty of Veterinary Medicine, Alexandria University for direct effective help during the fulfillment of this study.*

*Thanks are also due to **the Staff members of Department of Poultry and Fish diseases**, Faculty of Veterinary Medicine, Alex. Univ. , for their great support and encouragement during this work.*

# Content

Item	Page
<b>I-Introduction</b>	<b>1</b>
<b>II-Review of literatures</b>	<b>3</b>
1- Definition of Edwardsiella	3
2- History of Edwardsiella infection	3
3- Species of Edwardsiella	4
4- Identification of Edwardsiella	5
5-Susceptibility of fish to Edwardsiella ictaluri	10
6-Pathogenicity of Edwardsiella	10
7- Clinical signs and pathogenicity	11
8-Predisposing factors associated with the incidence of Edwardsiella.	15
9-Histopathology of E. tarda and Ictaluri	16
10-Medium for isolation of Edwardsiella	16
11-Importance of PCR in identification of Edwardsiella	17
12-Other methods for identification of Edwardsiella species	18
13-Prevention and Control	20
14-Zoonotic importance of Edwardsiella	24
<b>III- Material and Methods</b>	<b>26</b>
<b>IV-Results</b>	<b>37</b>
<b>V-Tables and figures</b>	<b>42</b>
<b>VI-Discussion</b>	<b>75</b>
<b>VII-Conclusion</b>	<b>83</b>
<b>VIII- English Summary</b>	<b>84</b>
<b>IX-References</b>	<b>86</b>
<b>Arabic Summary</b>	

## List Of Tables

Table ( 1a ): Strains of <i>Edwardsiella tarda</i> used in this study.	5
Table(1-b) : Biochemical characteristics of <i>Edwardsiella tarda</i> and <i>Edwardsiella ictaluri</i> after (Wkabayashi & Egusa 1973, Hawke et al., 1981; Farmer & McWhorte 1984; Wltman et al., 1986 a, b	8
Table (1) :- Experimental design of LD <sub>50</sub>	30
Table (2) : Design of chronic experiment.	31
Table (3)The design of challenge test.	36
Table (4): Results of PCR for direct detection and identification of the isolated <i>E. tarda</i> from various organs and tissues of experimenally infected fish.	42
Table (5): LD <sub>50</sub> of <i>E. tarda</i> in Monosex tilapia and Mugil cephalus.	42
Table (6): Effects of <i>E.tarda</i> infection and <i>E.tarda</i> + Amm.choloride on differential leucocytic counts of <i>Monosex tilapia</i> at different weeks of experiment. (Mean $\pm$ S.E).	43
Table (7): Effects of <i>E.tarda</i> infection and <i>E.tarda</i> + Amm.choloride on differential leucocytic counts of <i>Mugil cephalus</i> at different weeks of experiment. (Mean $\pm$ S.E).	44
Table (8): Effects of <i>E.tarda</i> infection and <i>E.tarda</i> + Amm.choloride on Phagocytic assay of <i>Monosex tilapia</i> at different weeks of experiment. (Mean $\pm$ S.E).	45
Table (9): Effects of <i>E.tarda</i> infection and <i>E.tarda</i> + Amm.choloride on Phagocytic assay of <i>Mugil cephalus</i> at different weeks of experiment.(Mean $\pm$ S.E).	46
Table (10): Effects of <i>E.tarda</i> infection and <i>E.tarda</i> + Amm.choloride on WBCs, RBCS, Hb and PCV% of <i>Monosex tilapia</i> at different weeks of experiment. (Mean $\pm$ S.E).	47
Table (11): Effects of <i>E.tarda</i> infection and <i>E.tarda</i> + Amm.choloride on WBCs, RBCs, HB and PCV% of <i>Mugil cephalus</i> at different weeks of experiment. (Mean $\pm$ S.E).	48
Table (12): Effects of <i>E.tarda</i> infection and <i>E.tarda</i> + Amm.choloride on glucose level of <i>Monosex tilapia</i> at different weeks of experiment. (Mean $\pm$ S.E).	49
Table (13): Effects of <i>E.tarda</i> infection and <i>E.tarda</i> + Amm.choloride on glucose level of <i>Mugil cephalus</i> at different weeks of experiment. (Mean $\pm$ S.E).	50
Table (14): Effects of <i>E.tarda</i> infection and <i>E.tarda</i> + Amm.choloride on serum proteins (Albumin, globulin, total protein and albumin/globulin ratio) level of <i>Monosex tilapia</i> at different weeks of experiment. (Mean $\pm$ S.E).	51
Table (15): Effects of <i>E.tarda</i> infection and <i>E.tarda</i> + Amm.choloride on serum proteins (Albumin, globulin, total protein and albumin/globulin ratio) level of <i>Mugil cephalus</i> at different weeks of experiment. (Mean $\pm$ S.E).	52
Table ( 16): Antibody titer in of <i>Edwardsiella tarda</i> in both <i>monosex tilapia</i> and <i>Mugil cephaleuis</i> at different treatments and different weeks.	53
Table (17): Mortality number and relative level of protection of <i>monosex tilapia</i> and <i>Mugil cephaleuis</i> among different treatments.	53
Table (18): Results of direct detection of <i>E. tarda</i> in various organs from which <i>E. tarda</i> was isolated.	54
Table (19): Results of direct detection of <i>E. tarda</i> by PCR in various organs from which <i>E. tarda</i> could not be isolated.	54