Cairo University
Faculty of Veterinary Medicine
Department of Veterinary Hygiene and Management

INVESTIGATION OF THE SANITARY CONDITIONS IN EGYPTIAN FISH HATCHERIES AND THEIR EFFECTS ON HATCHERY PERFORMANCE

Thesis presented

By

NADA MAHMOUD MOHAMED ALI ELKABANY
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Animal, Poultry and Environment Hygiene
Under the supervision
Of

Prof. Dr.
Mohga Fouad Mahmoud Badawy
Professor of Animal, Poultry and Environment Hygiene
Faculty of Veterinary Medicine
Cairo University

Dr.
Tamer Fawzy Ismail
Lecturer of Animal, Poultry and Environment Hygiene
Faculty of Veterinary Medicine
Cairo University

Dr.
Samah El said El sayed Laban
Lecturer of Animal, Poultry and Environment Hygiene
Faculty of Veterinary Medicine
Cairo University

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DEDICATION

TO my dear kind parents, my husband, my lovely son **Mazen**, my brother and my sister.

Cairo University.
Faculty of Veterinary Medicine.
Department of Veterinary Hygiene and Management.

Name : Nada Mahmoud Mohamed Ali El-Kabany

Date of birth : 2/5/1991

Nationality : Egyptian

Specialization : Animal, Poultry and Environment hygiene

Scientific degree : M. V. Sc.

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Under supervision of

Prof. Dr. Mohga Fouad Badawy

Dr. Tamer Fawzy Ismail

Dr. Samah El said El sayed Laban

Abstract

A field study was conducted in two tilapia hatcheries, hatchery (A) located at El Fayoum Governorate and hatchery (B) located in Sharkeya Governorate, to investigate the effect of water quality on seed production. Eighty-four water samples were collected from the inlet, outlet, broodstock ponds, egg funnels and nursery ponds for determination of physico-chemical condition and microbial count of water used for incubating eggs and nursing frys. Fry and eggs samples were also examined for microbial loads. The following study was also designed to assess the effect of using Iodophors 3.5 % on hatchability % and microbial load of tilapia eggs and to evaluate the effect of using different disinfectants on different tools used in the hatchery for reducing pathogens number. Results of the field study indicated that there was no significant difference between both hatcheries with respect to microbial counts of water samples, fry and eggs, although they were slightly higher in hatchery (B) than hatchery (A). Temperature (Temp.) and pH were not significantly different among water samples from both hatcheries. Dissolved oxygen (DO) and nitrite were significantly different for water samples used for incubating eggs recording (5.11 ± 0.305)**,** (4.80 ± 0.44) mg/dl, respectively in hatchery (A) and (0.06 ± 0.03)**,** (0.09 ± 0.06) mg/dl, respectively in hatchery (B). DO and nitrite were also significantly different for water used for rearing fry with means of (4.84 ± 0.24)**,** (5.11 ± 0.47) mg/dl, respectively in hatchery (A) and (0.08 ± 0.05) and (0.11 ± 0.10) mg/dl, respectively in hatchery (B). Ammonia showed significant different $P < 0.05$ between both hatcheries for water samples used for incubating eggs with means of (0.23 ± 0.09) and (0.72 ± 0.35) mg/dl, respectively, while ammonia in water samples used for rearing fry were not significantly different between both hatcheries. The low level of difference in both microbiological and physico-chemical parameters between the two hatcheries didn't affect fertility, hatchability and mortality% as it recorded 95%, 90% and 10 % respectively in hatchery B and 96%, 91%, 9 % respectively in hatchery A. The better performance of hatchery (A) may be due to better sanitary measurements adopted. Results of application of iodophors 3.5% on tilapia eggs showed that total bacterial and total fungal count of tilapia eggs was affected significantly by concentration at 10 ppm for 15 min as contact time. Hatchability percentage was significantly higher at 10 ppm than that of 50 and 100 ppm. Halamid 1% and Virkon S were the most

effective disinfectants for total bacterial count reduction on tools, with an overall log reduction > 4 log after 5 min for Halamid, and after 10 min for virkon S. Halamid 1% and Virkon S 1% were the most effective for total fungal count reduction, with an overall log reduction > 4 log after 10 min, However, Usage of salt and exposure to sunlight caused > 3-4 log reduction in the total bacterial count and > 4 log reduction in the total fungal count after 15 min.

Keywords: Tilapia hatcheries- fry and eggs- water quality- microbial counts- egg disinfection - tools disinfection

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List of Abbreviations

APHA	American public health association
APVMA	Australian Pesticides and Veterinary Medicines Authority
CFU	Colony forming unit
cm^2	Centimeter squared
DO	Dissolved Oxygen
dl	deciliter
FAO	Food and Agricultural Organization
FDA	Food and Drug Administration
GAFRD	General authority for fishery resources development
gm	Gram
HI	HANNA Instrument
Kg	Kilogram
L	Liter
Log	Logarithmic
m^2	Meter squared
min	Minute
ml	Milliliter
mg	Miligram
MSDS	Material Safety Data Sheet
PPm	Part per million
TAN	Total ammonia nitrogen
Temp.	Temperature
TBC	Total bacterial count
TFC	Total fungal count
UIA	Unionized ammonia
µm	micrometer

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