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STUDY ON SOME BACTERIAL PATHOGENS INFECTED FRESH WATER FISH *OREOCHROMIS NILOTICUS* FROM JEBEL AULIA RESERVOIR SOUTH OF KHARTOUM, SUDAN

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Abstract:-

This study conducted to investigate some bacteria pathogens infected fish in Jubal Aulia Reservoir south of Khartoum in the Sudan the target fish were selective for examined Oreochromis niloticus family (Tilapia), One hundred in number fresh samples of Oreochromis niloticus collected from the Reservoir in (White Nile) Ranged in length 1140cm and in weight 50- 1during the period 2017- 2019, using standard microbiological methods for investigation and identification microbial bacteria. Aeromonas hydrophila, mycobacterium forutium, Staphylococcus and streptococcus feacium were isolated from eyes, mouth, fines, gills and skin. Results observed total sampls of fish infected were (86), Staphylococcus sp record high risk infection rate 42%, Aeromonas hydrophila 24.5 %, streptococcus faecium 23 %, and ,mycobacterium forutium 10.5 the percentage of bacterial pathogens 100 % and distribution at all seasons, with different significant change (P≥0.05,0.02,0.04) the study included and focused on culture descriptions and classification general characteristics about four types pathogen bacteria isolated. In present finding observed stress and lesions but no necrosis and mortality rate were recorded due the infection, as for pathogens made fish meat very depreciate hence one of the study recommended that follow up – studies to evaluate the microorganism changes in white Nile to protect economic resources and fish health.

Key words: - *Pathogen, Oreochromis, Jebel Aulia. Sudan*

INTRODUCTION

The importance fish pathogens is related directly to the economic values of fishes that may be affected. as our word more populated, all foodstuffs, including fishes , becomes increasingly valuable . it is well known that fishes are an excellent source of proteins containing little saturated fats Fish can die through disease or pollution of the water. In case of pollution, death is more or less rapid for all sizes belong in Sometimes, to various species .the different between diseases and pollution is not absolute for the cause of bad quality water which may cause more or less serious diseases Wildgoose (14). Hubber, (4) The frequency and important of disease which occur on fish farms can be as a result of stocking density and poor conditions of farming , the small number of species disease. In a wild- state, fishes are widely dispersed and the diseases are often not noticed as the risks of contamination fewer and the losses less. Conditions such as holding warm water fishes in cold water, during the summer and debilitation caused by other factors probably render fishes susceptible to be attacked by bacteria Hoffman, (5). Most of the bacteria associated with the fish diseases are naturally saprophytic organisms, widely distributed in aquatic environment may be present on external body surface in the tissue of apparently health fish and their pathogenic role will only manifest itself as a consequence of stress

Objectives

1- to investigate and indentify fish bacterial pathogens from the residual drown and bad director people activities on White Nile
2- to detect the Impact of bacteria mainly *streptococcus sp* contaminated fish in white Nile

Material and method

The material used for present study in the period 2017- 2019 collected from Jebel Aulia reservoir is located south of Khartoum state , almost 50 km away from Khartoum along the white Nile at Khartoum state . The *Oreochromis niloticu*s were a target fish for investigation preserved in ice – tanks then transported to the veterinary science laboratories in soba area for analysis.

Media preparation:

The media used for culturing growth bacterial both selective and non- selective media that were blood, Columbia, nutrient agar, and nutrient broth it was sterilized by autoclaving at 121c^{o} for 15 minutes . Then the sterile medium was poured in sterile Petri dishes ready to be used

Culturing and Isolation of Bacteria:

Smears used for detection bacteria from wet tissue of eyes, mouth, skin , gills and fines used disposable swap then incubation at 37co the growth appear within48-72 hrs in most culture accept mycobacterium require 3 weeks **Stained**

Smears:

Gram stain used for diagnosis are commonly used for determine of bacteria confirmed by culture were required in majority of cases the identified of isolated bacteria according to the method described by Lucky(7) The identification was based on the cultural characteristic, especially the color of surface of the colony and the rate of growth and size, And Classification according to Robert ,(13)

Statistical Analysis:

SPSS program (ANOVA TEST)

Results

Sample that were diagnosed were one hundred(100) in number of *Oreochromis* collected from Jubal Aulia reservoir to investigated bacteria , species were isolated *Aeromonas hydrophila* mycobacterium *forutium,* S*taphylococcus* and *streptococcus feacium* were isolate from eyes , gills , fines and skin

Culture and general characteristic of bacterial isolated

1- *Aeromonas. hydrophila*

Cells straight, rod shaped with rounded ends bacilli. gram- negativ**e** motile, *growth in high temperature optimum 37c^{o} live naturally in freshwater* the colony yellow in color in the nutrient ager media**.**
*classification in Ode*r. *Eubacteriales* family *Eubacteriaceae, genus Aeromonas,* fresh *fish O.niloticus* were infected were 21 samples with general prevalence infection 24. 5 % shows in table (1) the general characteristic of A. hydrophila**, oxidase,** catalase, gas from glucose, manitol and Acetone from glucose growth in blood ager were positive shows in table (2)

2- *Staphylococcus s**p***

Staphylococcus, oder. formicutes, family Staphylococcus. genus Staphylococci gram positive rode shaped ,non- motile, growth at 37c^{o} in solid media, anaerobic showed in table (2) ,infected fresh water and marine fish. *Fish O.niloticus* were infected were 36 samples with general prevalence infection 42 % shows in table (1)

3- *Streptococcus feacium*

Streptococcus in Oder Cytophales, family *Streptococcaceae* genus *streptococcus and species* ***feacium*** , gram positive rod shaped from enterococci group , cells spherical , occurring in chain when growth in liquid media or blood ager , anaerobic , catalase negative, growth on solid media at 37 Rare c° shows in table (2). *fish O.niloticus* were infected were 20 samples with general prevalence infection 23 % shows in table (1

4- Mycobacterium fortuitum:

Classified in family mycobacteriaceae, genus myco bacterium, genus fortuitum, non –motile, growth slow colonies growth in 7days to 3weeks at low temperature 25c°the special bacteriological techniques used for indentification were fish O.niloticus were infected were 9 samples with general prevalence infection 10,5 % shows in table (1)

Table (1)

Species of Bacteria Isolated From fish infected and Percentage of Bacterial

Species of bacteria isolated	Number of fish infected	Percentage of Bacterial infected %	Found seasonality
A. hydrophila	21	24.5	All seasons
Streptococcus	20	23	All seasons
Mycobacteriu*m*	9	10.5	All seasons
Staphylococcussp	36	42%	All seasons
Total	86	100	

Table (2)

General Characteristic of Bacterial Isolated from fresh water fish *Oreochromis niloticus* from Jebel Aulia Reservoir

General Characteristic	Bacterial Isolated			
	A. hydrophila	*Staphylococcus*	*S.faecium*	*Mycobacterium fortuitum*
Oxidase	+	-	+	+
Manitol	+			+
Gas from glucose	+	+	+	+
Spores	-	-	-	__
Urease	-	-	-	+
Coagulase	+	+	-	_
$H_2S$from cystein	+	+	+	-
Catalase	+		-ve	+
Shape	Bacclii	Cocci	Cocci	Bacclii
CAMP			+	Bacilli
Acetion from glucose	+	+ Rare Rare Rare	+	_
Fermentation	Non	+	+	
Indol production	-	+	-	

Table (3)

Over all of Number and Parentage of fish infected with bacteria according to the three seasonality

	Winter		Summer		Rain season	
	No. of fish infected	Parentage (%)	No. of fish infected	Parentage (%)	No. of fish infected	Parentage (%)
A. hydrophila	8	16	1 6	32	3	Rare
Streptococcus	10	20	8	16	2	Rare
Mycobacteriu*m*	5	10	6	12.5	3	Rare
Staphylococcus sp	17	42	20	40	4	Rare

Table (4)
ANOVA test **M±SD** for different bacterial pathogens from Isolated from the Organs of *Oreochromis niloticus*

Parameters	Treatment	Mean difference	Std- error	Sig	95%Confidence Limits	
					Lower	Upper
Eye	*staphylococc us*	-7.000	5.317	7.67	18.85	4.89
	streptococcus	5.000	5.317	3.67	-6.85	16.85
	A. hydrophila	0.000	2.338	1.000	5.12	5.21
Mouth	*staphylococc us*	-333	2.741	-906	-5.77	6.44
	streptococcus	1.000	2.741	-723	5.11	7.11
	A. hydrophila	000	2.338	1.000	5.21	5.21
Gills	*staphylococc us*	-4.000	2.741	175	10.11	2.11
	A. hydrophila	2.000	2.74	482	4.11	8.11
Skin	*staphylococc us*	10.667	3.870	0.020	19.29	2.40
	streptococcus	9.000	3.870	.042 0	17.62	0.38
	A. hydrophila	8.000	3.870	0.00. 05	0.52	15.52

Discussion:
Kitoa etal,(6) reported *streptococcus sp from Oreochromis niloticus* in Japan in out breaks caused by hemorrhagic lesions on the body and exophthalmia, also Miyazaki, (9) found *streptococcus* in cultured tilapia hybrids in Taiwan have similar clinical gross pathological sings , Eldar and Hubber(2,4) found *streptococcus* in the spleen , kidney ,ovaries and test in farmed fish and they suggested both a etiological agents and environment lead to the pathogenesis Amin ,(1) and ,Roberts, (13) they Reported *Aeromonas hydrophila* gram negative bacteria from farmed tilapia in Nile in Egypt and Robert (13) recorded *Aeromona*s from *O.niloticus* in the Mombasa lip-po(8) and paperna (11) they reported cause characteristic chronic condition and mortality of carp infection with *Aeromonas hydrophila* , resulted in mortalities with 24 – 48 hours the old fry died at rate of 15% daily. The present study finding Aeromonas hydrophila infected *O.niloticus fresh water in the W*hite Nile in the Sudan cause with stress and lesions and mortalities due the infection record Mycobacterium *fortutium* gram positive bacteria infected fresh water fishes transmission through the brachial-egg's, skin and internal organ infected , mycobacterium chronic disease caused the slow mortality rate in range 50% FAO,(3). Reported caused of deformations fish vertebra also Nigelli. (10) Observed mycobacterioses in more than 150 species of marine and freshwater fish commonly, the present study isolated mycobacterium fortuitum from *O. niloticus* with low prevalence rate 10.5%. Plumb (12) described streptococcal and staphylococcal infection in channel Catfish and Juvenile of rain bow trout with mortality caused. in present finding isolated from eyes , gills, and skin of O. niloticus the staphylococcal sp with high rate of infection in all seasons but streptococcal feacium isolated with medium of infection rate.

Conclusion:
Bacterial pathogenesis infected freshwater fish found naturally in the water environment isolated from eyes , fines , mouth , gills and skin in all seasons caused with stress lesion no mortality rate recorded the this study may be that refer unfound of pressure condition like lake of oxygen, change in PH and residual of ammonia in the study area to lead breakout pathogen in epizootiology form, or may be the incidence pathogens risk in ruing water simple than water of aquaculture farms .

Recommendation:
1- Study recommended follow up – studies to Eva mate the changes in White Nile to protect economic resources and fish health.
2- Constructed laboratory and information centers for concerning early diagnosis fish pathogens and pollution environment in White Nile

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