

MASS PRODUCTION OF OREOCHROMIS NILOTICUS FRY WITH REFERING TO EGG DISEASES

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ABSTRACT

Oreochromis niloticus was used for production of enough number of fry in three successive hatching . the hatched fry were fed with artificial food mixed with 17 α - methyl testosterone for 21 days . The experimental fish , their eggs and the hatched fry were examined for detection saprolegrian infection . Moreover , the water quality throughout the experimental time was examined . The clinical sings were cotton like growth on the head region, operculum, fins, body surface and eyes. The infected eggs appeared brown in colour with fungal growth . *Saprolegina parasitica* coker was isolated from the skin, fins, gill lesions of infected fish and eggs .

We run the experiment comparing the healthy eggs with the fungus infected eggs. The healthy eggs were hatched and we were able to rear them until the fingerlings stage. The fungal infected eggs were treated by using hydrogen peroxide bath and completed rearing the fry's till the fingerlings stage. Roberts , 1989 .

INTRODUCTION

Tilapia is a native fish for the country because of their flesh and its good taste, the most important cultivable fish species in the world (Bardach et al., 1972). They posses several desirable characteristics which recommended them for culture on a wider scale in the tropics and sub-tropics (Lowe- McConnel, 1955 ; Hickling, 1960 & 1963; Swingle, 1960 and Lovshin and Da - Silva 1975).

Tilapia are not only an important source of food for nural poor, but also for other socioeconomic groups. Tilapia distribution is limited by water temperature with a minimum level of 10-15°C being needed depending on the species (Balarin and Hatton, 1979). These fish have wide tolerance of poor water quality. Furthermore, they feed low in the natural food chain, convert artificial food efficiency, grow fast at high stocking rates, have good quality flesh without intramuscular bones are resistant (Hickling, 1960; Lovshin and Da Silva, 1975). Swingle (1960):

McBay (1961); Hickling (1960) and Lovshin et al. (1974) provide biological information on the behaviour of *Tilapia nilotica*. The repeated reproduction in the pond environment is the major disadvantage of *Tilapia* (**Hickling, 1963**).

This results in over population of the growout pond with different sizes of fish which will result in harvest of undersized fish of low economic value.

Most *Tilapia* species are found to spawn more than one time a year with the frequency varying according to geographical region (**Huet, 1955**). A positive correlation has been found between the number of broods in a breeding season and water temperature (**El-Zarka, 1956**).

T. mossambica has been found to spawn at 30 to 40 day intervals for the whole year in tropical Indonesia (**Va as and Hofstede, 1952**). The spawning frequencies of *Tilapia* under various conditions have also been studied (**Aronson, 1949; Fryer, 1961; Cridland, 1961; Reidel, 1965 and Lee, 1979**).

Saprolegniosis is a fungal disease of fish and fish eggs caused by the mold fungi which belong to the order Saprolegniales mainly of the genera *Saprolegnia* and *Achlya* (**Bauer et al., 1973; Nolard, 1974; Post, 1983; Kabata, 1985 and Roberts, 1989**). The disease is characterized by presence of cotton like growth, white to gray or gray to gray-brown in colour on the skin fins, gills or eyes of fish and eggs (**Post, 1983; Bohm and Fuhrmann, 1984 and Singhal et al., 1987**).

The major problem in production of all-male hybrid tilapia fingerlings is production on a large scale obtaining small numbers is not a problem but the development of a commercial technique is still needed (**Lovshin and Da Silva, 1975**). So it is urgently to make a large number of tilapia fry available, they should be the same age and approximately the same size to have enough number of fry to stock the rearing ponds thus the present study was planned to make a trial solving such problem in *O. niloticus*.

MATERIAL AND METHODS

These experiments have been done in Behara Governorate. The water quality parameters measurements were carried out using kits (Hak American Production Model FF3 Cat No. 2430-03).

Experimental Facilities

Trial I in aquarium:

The fish were divided into 3 equal groups and lodged in 3 fully prepared glass aquaria (110 x

40 x 50 cm) equipped with aerating devices (RENA, 110) and supplied with dechlorinated water and thermostatically adjusted at $26 \pm 1^{\circ}\text{C}$. the number of fish used in the experiment were (90), (30) fish in each group, length of each fish (13 - 15) cm. we put the fish in the aquarium to observe the behaviour of treated and untreated fish

Trial II in ponds:

Eighteen earthen ponds, 4 of them are quarter of Feddan, 12 of them are one handerd meter each hapa contained. the 13 fish, 10 of them are females and 3 males each female average weight 90-120 grams. San marrow mash 195 fish were stocked in 15 hapics. In each pond after stocking, the fry the eggs hatches and the fry swam together with their parents for (6-8) days and then they swam out the hapics and were fed both with artificial food mixed with the hormone (17 α - methyl testosterone) for 21 days. Then transferred to one of the small ponds (one quarter of feddan) for three weeks. The average weight of the fry was ranging between (3-5) average grams. They were collected in hatch number one (3120), hatch number two (7200), hatch number three (4480) and hatch number four (7200). Average number produced by one fish in hatch number one (312), hatch number two (720), hatch number three (448) and hatch number four (720). Not all the females well spawned together but at most one third of it will spawn together successfully every two to three days then the whole hatches will spawn in about six to eight days and these the figure is the number of fry spawned by each one fish.

Clinical and Postmortem examination of fish:

The clinical signs and post martam lesion of naturally infected *O. niloticus* , fry and eggs were thoroughly investigated throughout the experimental period according to **Kabata (1985) and Austin and Austin (1987)**.

Mycological examination:

Pieces of tissues from skin lesions, fins, gills, internal organs and eggs were washed by sterile distilled water. The zoosporic fungi were recovered using baiting technique with hemp seed as baits (**Khallil, 1984**). The seeded plates were incubated at 22°C for two weeks during which the growing colonies were identified according to **Seymour (1970)**.

RESULTS AND DISCUSSION

The water quality parameters measured during the experimental period were documented in Table (1) and were suitable for fish spawning and rearing

This piece of research has been done in two trials to observe the spawning behaviour and nurse of producing a large number of fry in earthen ponds.

The spawn took place in latter more than one third of the females each spawned female give the stated number of fry.

Clinical and postmortm findings:

The most prevalent clinical signs of saprolegniasis in the naturally infected Tilapia species were the presence of cotton like growth on the head region and the operculum including both eyes and lead to blindness of fish. Moreover, the fungal growth was distributed as the dorsal and tail fins - skin ulcers were resulted from fungal detachment

There were no changes on the internal organs.

Infected eggs were brown while dead eggs were white because of precipitation of egg protein (fig. 1)

The clear white threads of saprolegnia fungus on *Oreochromis niloticus* .(Fig. 2)

Mycological examination:

During this investigation *Saprolegnia parasitica* coker of *saprolegnia* species were isolated. Identification of broad aseptate, fungal hyphae in skin or gill lesions is sufficient for clinical treatment decisions. Oomycetes vary in drug susceptibility *in vitro*, but the lack of similar data a clinical response to various drugs has made these differences academic. However, determining the type of Oomycete involved will become a more important consideration as various therapies are compared in clinical situations.

Determining that a fungal organism is an Oomycete requires the observation of a sexual sporangia . Asexual sporangia also allow classification to genus, while *saprolegnia* are seen occasionally an infected fish a culture is usually required to elicit these structures. Identification to species is based on sexual stages in culture **Fuller and jaworski 1987** .

Some fry has been lost during spawning due to unfertil eggs and handling were able to produce (87600).

The above observations and particularly the sequence of deposition and fertilization of eggs differs from the descriptions of **Schultz (1955); Dadzie (1970a); Pruginin et al. (1975); Lee (1979) and Jossif (1981)**. The male cleaned the bottom of the aquarium and make territorial ar-

areas then he reclean it again and chase the females until he finds one is ready to spawn. They swam first at the top or mid water in the aquaria and he kept on making the courtship with the ready female chasing her to his territorial area then he started releasing his milt (**Khater, 1982**) on the bottom of the aquarium in a straight line then the female tried to locate the line of the milt using her nose then she released the ova on top of the milt and turn again collecting the fertilized eggs in her mouth, . collecting way is different from other authors (**Cridland, 1961; El-Zarka, 1956; Lovshin and Da Silva, 1975; Jossif, 1981**), they mentioned that females releases the ova first but it was observed that the males put his milt first.

In this investigation, the clinical signs of saprolegniosis in Tilapia species was characterized by the presence of cotton wool like growths on head region, operculum, fin, sides of the body and eyes. Such clinical signs were also described in Tilapia species by **Easa and Amin (1987)**.

Saprolegnia parasitica coker were the most common saprolegnia species isolated from fish infected with saprolegniosis (**Willoughby, 1968 & 1970; Nolard, 1970; Bauer et al., 1973; Post, 1983 and Easa and Amin, 1987**).

Only one zoosporic fungal species namely *saprolegnia parasitica* coker was isolated from skin lesions, gills and eggs of naturally infected fish. **Seymour (1970) and Ismail et al. (1979)**.

Table (1) Showing the average water quality parameters

Water parameter	Measurement unit	Mean
Water temperature	°C	26
pH		7.4
Disolved oxygen	µg/Liter	5.54
CO ₂	µg/Liter	5.71
Nitrogenous amonia	µg/Liter	00.0
Nitrogenous nitrite	µg/Liter	10.0
Nitrogenous nitrate	µg/Liter	80.00
Total acidity	µg/Liter	56.11
Total alkalinity	µg/Liter	422.1
Total hardness	µg/Liter	413.5
Salinity	µg/Liter	10.4
Total phosphate	µg/Liter	0.026

Table (2) Showing Fry production/for each spoon

No. of females	Spent females	No. of fry produced per hapa	No. of hatched fry
40	17	3120	12480
40	15	7200	28800
40	16	4480	16520
40	18	7200	28800

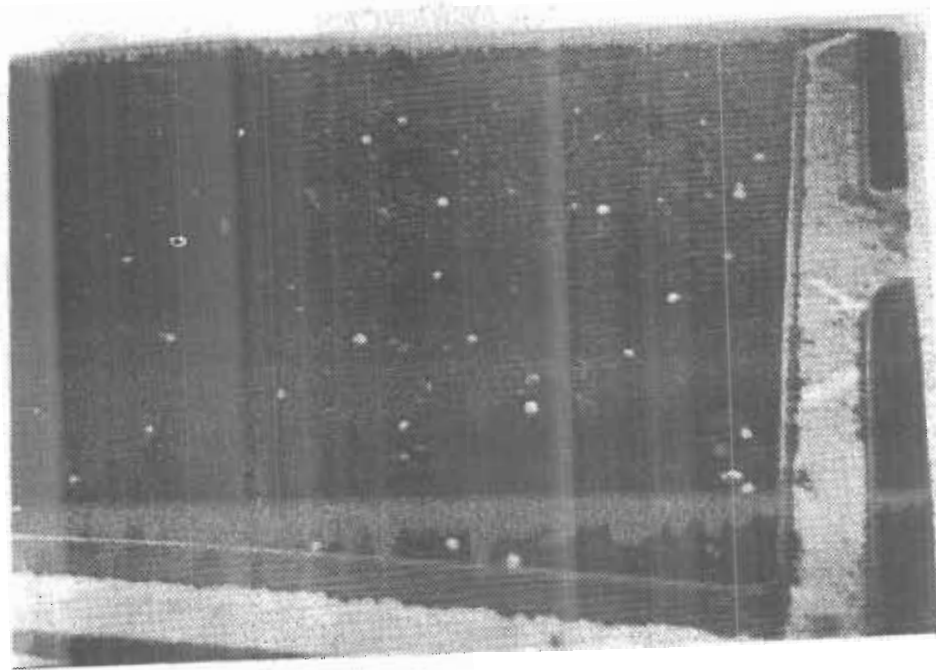


Fig. 1 : Water mold - infected egg of *O. niloticus* fish.

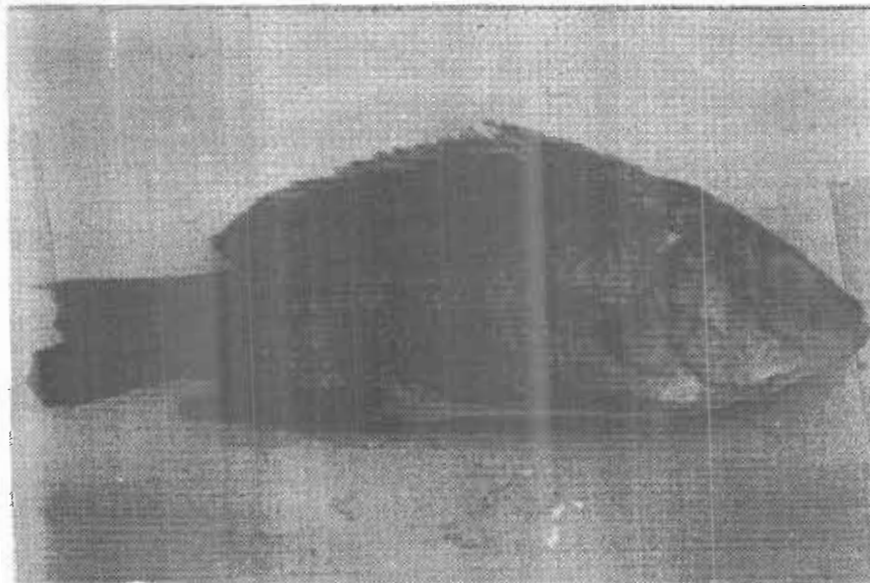


Fig. 2 : The clear white threads of saprolegnia fungus on *O. niloticus*.

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الملخص العربي

إنتاج كميات كبيرة من زريعة أسماك البلطى بالإشارة إلى أمراض البيض

المشركون فى البحث

أميمه عبود على خاطر

أخذت عينة من البلطى النيلى الذى تم إستخدامه فى هذا البحث وحفظها حيث أمكننا إنتاج عدد كاف من الإصبعيات فى تفريخه واحدة، وقد أظهرت النتائج أننا يمكن أن ننتج الأعداد المطلوبة من الزريعة والمحافظة عليها طول الموسم ثم تربيتها وتشتيتها للعام القادم حتى تكون جاهزة على أن تبدأ بها الموسم الثانى وبالتالى بهذه الطريقة يمكن أن ننشىء مفرخات سمبكة تمدنا بالأعداد المطلوبة من الزريعة دائماً وهذه طريقة أسهل لإنتاج الزريعة طول موسم التفريخ طوال العام.

عينات أسماك البلطى التى جمعت أثناء موسم التفريخ بفحصها وجد أن بعضها مصابة بمرض السابروليجينا. لقد تمثلت العلامات الإكلينيكية فى نمو يشبه وبر القطن على مناطق الرأس وغطاء الخياشيم والزعانف وسطح الجلد والعينان هذا بالإضافة إلى لزوجة البيض معاً وذلك يزيد من العدوى بالفطر بعض من هذا البيض كان نافقاً.

سابروليجينا بارازيتكا كوكر تم عزلها من المناطق المصابة فى الجلد والزعانف والخياشيم والبيض للأسماك المصابة، إستمرت التجربة بمقارنة البيض المصاب والبيض السليم، البيض السليم فقس واستطعنا رعايته حتى حجم الإصبعيات أما البيض المصاب بعد معالجته فقد منه نسبة كبيرة وتم فقس الباقي كما تمكنا من رعايته أيضاً إلى حجم الإصبعيات.