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EFFECTS OF SOME FACTORS ON THE SURVIVAL OF BLUE NEON GUPPY (*Poecillia reticulata*)

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Declaration by the candidate

The work described in this thesis was carried out by me under the supervision of Dr. (Mrs.) M. V. E. Attygalle and a report on this has not been submitted in whole or in part to any University for another Degree/Diploma.

.....

W. L. P. De Silva

Declaration by the supervisor

I certify that the above statement made by the candidate is true and that this thesis is suitable for submission to the University for the purpose of evaluation.

Name : Dr. (Mrs.) M.V.E. Attygalle

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EFFECTS OF SOME FACTORS ON THE SURVIVAL OF BLUE NEON GUPPY

(*Poecillia reticulata*)

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ABSTRACT

The objective of the present study was to investigate some factors that affect the growth and survival of Blue Neon Guppy in grow out glass tanks.

The adult Blue Neon male Guppy is approximately 4 cm in length and female is about 5 cm in length. Males and females were stocked in different glass tanks. Both were fed with formulated feed thrice a day. Water level was maintained at a depth of 10 cm throughout the experimental period. Water quality was maintained by regular changing of water through siphoning and adding water up to the same level.

Some factors and survival number of the fish were observed on weekly basis. The survival rate was observed by changing the salinity, pH value and oxygen concentration in six tanks.

To control the spreading diseases, some chemicals such as condys and methelene blue were added into the water. At the beginning of the experiment, same size 15 fish were added to the each tank.

High salinity, low oxygen concentration and low pH value are not suitable for fish to survive.

These findings are assisted to improve the management of ornamental fish (Guppies).

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CHAPTER 1

INTRODUCTION

1.1 Description of *Poceilia reticulata* in Sri Lanka

The guppy, a fish native to West Indies and part of central America was introduced to Sri Lanka's inland waters from about 1928 to 1945 as a mosquito larvivore by the anti-malaria campaign. The population of these species is now stable though it is not established in the drier parts of the country. It does not have any adverse ecological effects. They are able to survive naturally only in shallow urban drains and canals with flowing water. In Sri Lanka, *P. reticulata* has been found to occur only in urban and suburban environments, mainly in open drains.

Guppies confront little competition from other fishes and rarely occur in the "wild" in Sri Lanka, but are sometimes found in small perennieal water bodies associated with human habitation in areas including the central hills [1].

Guppies are the favourites of all aquarium fishes having majority of females. They are peaceful, friendly, hardy and so prolific. Male guppies are forever courting. If a female remains stationary and her partner contacts her vent with his gonopodium, she is fertilized. The sperm is preserved in the female's oviduct. A female is capable of having six or more broods. Gestation averages a month but can be much longer depending on the time of year, health of the female and conditions in the tank.

A pregnant female can be identified by the gravid spot behind her anal fin just posterior to the belly. Her sides appear swollen when viewing from above. The female should be kept in shallow water about 8 inches, aged water at 75° to 80° F in order to prepare for

her delivery. The floating plants should be provided at least two inches thick into which the newborn can scurry, for even the mother will eat them. The other fish should be fed heavily to suppress their hunger in the same tank. Disturbing a pregnant female may result in premature deliveries. Young females have smaller bodies. All of the newborn are about a quarter of an inch long. They are fed small meals at least three times daily [2].

They are also valued for live food for other fish.

1.1.1. Signs of a healthy fish [3]:

- Eats vigorously
- Active swimming
- Long, flowing fins
- Clear eyes
- Regular breathing

1.1.2. Signs of illness [4]:

- White spots on fins and body
- Labored breathing
- Frayed or red fins
- Loss of appetite

Then the water quality should be tested and improved as necessary.

1.1.3. Precautions

- Avoid crowded conditions: they are a major cause of stress and disease.

- Maintain good water quality with regular water changes and adequate filtration.

1.2 Ornamental fish industry

The ornamental fishery is a growing industry in Sri Lanka though it supplies less than 1 % of the total global market by value. In 1998, the value of the total exports of ornamental fish from Sri Lanka was Rs. 525. 6 million. The most valued and high in demand ornamental fish species are either endemic or indigenous to Sri Lanka. This increased foreign exchange received from Germany, Japan and U.S.A. for marine fish. Unscientific and selective removal of these fish from the natural environment has affected their eco system, which extend from East to the North Western coastal areas of Sri Lanka. Large scale, forty small scale and medium scale exporters handle ornamental fish industry. These exporters export fish to over 40 different countries. From this constituent over 60 % is Guppy. The semi intensive culture systems with low water exchange rates with minimal byproducts do not harm the environment [5].

Scientific quarantine procedures in importation of exotic fish have never been practiced. A significant number of eco systems have been affected by these fish.

Of the different fresh water fish exported, Guppy has the highest demand. There are 30 domesticated colour patterns and tail varieties for export in Singapore. The fishes have a life span of around one year. The present day demand for this species of fish may be due to the various colours and colour combinations and inherent qualities of this together with the low price. In addition Sri Lanka has won the prize for producing world's number 1 Guppy during the past few years. More than 70 % of exported fresh water fish species are viviparous.

Table 1.1: Import of ornamental fish (live) [External trade statistics of the customs]

Year	Quantity (kg)	Value in million Rs.
1992	46,371	3.1
1993	81,941	6.1
1994	99,502	13.0
1995	336,498	10.6
1996	20,457	12.6
1997	23,951	18.0

Table 1.2: Export of ornamental fish (live) [External trade statistics of the customs]

Year	Quantity (kg)	Value in million Rs.
1991	256,469	93.6
1992	386,765	159.8
1993	995,138	205.0
1994	743,046	248.3
1995	513,762	273.3
1996	618,559	310.2
1997	963,997	427.7
1998	1023,401	525.6

Guppies are Euryheline and hence can tolerate the different environments found in the coastal areas. The relatively high temperatures together with the readily available saline waters are the main reasons for the utilization of coastal regions for the production of these ornamental fish species. Coastal areas have the optimum conditions for rearing most of the tropical fish, which are in high demand. There is a growing demand for both aquatic and terrestrial ornamental plants in the export market [External trade statistics of the customs].

Table 1.3: Major countries importing ornamental fish {External trade statistics of the customs,[2]}

Year	U.S.A. No. of fish	Japan No. of fish	Germany No. of fish	Total value No. of fish
1993	11230620	8195391	5656991	52954458
1994	14961754	14458150	12153499	93103840
1995	44509169	44305697	32733552	236448808
1996	45390700	56662339	47795763	302970932
1997	83424292	109183564	50260319	242868175
1998	116678671	131948641	60061952	308689234

1.3 Taxonomy and description of Blue Neon Guppy

1.3.1. Classification of the Guppy

Phylum - Chordata