

Breeding Study of freshwater ornamental fish Neon tetra (*Paracheirodon innesi*)

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ABSTRACT

The present study deals with the breeding and rearing of Neon tetra. The fishes were reared in cement tank of size 48” x 36” x 36.” The water temperature was about 20-25⁰c and pH was 6.2-7.2. The foods offered were mixed food which contains natural planktons, earthworms, and prepared food (soybean flour+ Wheat flour+ mustered oil+ egg+ germinated gram+ salt+ calcium and mineral powder). The breeding of Neon tetra was done in glass aquarium of size 30” x 12” x 15” in the month of April and August. Spawning took place after 20-24 hours. As soon as spawning was completed, the breeding pair was removed as the parents will quickly eat the eggs. The total number of eggs laid was 312. Hatching was completed in 26-28 hours and hatching percentage was 50%.

Key word:- *Rearing and breeding, Neon tetra, Paracheirodon innesi.*

Introduction:-

Ornamental fishes are often called as “living jewels” due to their colour, shape, behavior and origin. They are peaceful, generally tiny, available in different colour and capable of living in confined space. The brilliant, flamboyant colour and exotic appearance of the fish appeal to one and all children and aged alike. Ornamental fish keeping is the second most popular hobby in the world next to photography (Das et al. 2005). Ornamental fishes can be kept in confined spaces like an aquarium or garden pond with the purpose of enjoying their beauty (Mukherjee et al. 2000). Ornamental fish culture also known as aquaculture, is the culture of attractive, colorful fishes of peaceful nature in confined aquatic systems. Ornamental fish production is an important component of the aquaculture industry. The ornamental fish trade is a foreign exchange earner, besides being a source of employment. It has a significant role in the economy of developed and developing countries. Ornamental fish keeping has been serving as a viable recreation, especially for hobbyists from time immemorial. The ancient Romans were the first to keep ornamental fishes as pets at homes. The art of rearing the beautiful fishes by colour, design and shape spread rapidly throughout the world. With the growing interest on the fanciful varieties of

brightly coloured organisms, ornamental fish culture developed as a tremendous business. In recent years, this hobby has spread all over the world. As a result, many countries in Asia and Europe started capturing and culturing the colourful, fanciful and the fascinating breeds of the fishes. More and more fishes from the marine, brackish and freshwater environments have been domesticated and popularized for business purposes. Neon tetras (*Paracheirodon innesi*) are beautiful and popular freshwater fish known for their vibrant colors and peaceful nature. The aim of present study to provides relevant information's of breeding and rearing of Neon tetras to farmers (beginners) of the local area to develop ornamental fish farming as small scale bio-industry.

Material and Method:-

The present work was conducted at department of zoology Govt. Girls (P.G.) College, Sri Ganganagar (Rajasthan) for a period of 8 months from January, 2016 to August, 2016. The climatic condition of Sri Ganganagar varies widely with temperature reaching 0⁰C in winter and those of summer touching 50⁰C with almost nil to scanty rains. Initially, Neon tetras (*Paracheirodon innesi*) were transported from Delhi in January, 2016. After 12 hrs of journey fishes were acclimatized for 30 to 45 minutes and unpacked and released in cement tanks. Fishes were fed with farax, readymade food, live food (earthworms, Daphnia) and prepared food for three months. A regular monitoring of water quality parameters were done in all aquaria and cement tanks and water exchange was also done when needed. In culture, chlorine free tap water was used. The various parameters of water such as temperature, pH, CO₂ content, DO and alkalinity were determined during culture and breeding period by following the methods of *Trivedi and Goel(1984)* and *APHA(1998)*

The neon tetra has a slender torpedo-shaped body that reaches no more than an inch and a half in length. Neon tetra is a very beautiful and colorful fish. From the tip of the nose to the adipose fin, the neon tetra has a bright neon blue stripe. Below the blue stripe, the neon tetra sports a white-silver belly. Past the belly, a bright red stripe extends all the way to the tail. The striking red, white, and blue combination make the neon tetra one of the most popular of all aquarium fish. Neon tetras are peaceful fish that get along well with most community fish. While Neon Tetra is not the easiest fish to breed it is possible for the home aquarium enthusiast to have success. In the wild Neon tetras are extremely prolific breeders capable of doubling their population in less than 15 months. Neon tetras eat a variety of foods. A balanced diet ensures the parents are healthy and ready to breed. To condition the parent fish for breeding, feed them high-quality foods with high protein content, such as live food. These foods will help the fish build their energy and prepare them for breeding. Increase the feeding frequency to twice daily and provide enough food to satisfy their hunger. Do not force-feed fish, as this can lead to stress or illness.

Breeding in Neon tetra (*Paracheirodon innesi*):

In the breeding of Neon tetra fish the following aspects were considered:-

Selection of brooders: - Active and healthy brooders were selected. Fishes were identified as male and female.

Feeding: - Before breeding fishes were fed with live and artificial food for a period of three months.

Temperature:- In the natural environment, fishes generally spawn when certain stimuli prompt them to. One of these stimuli is temperature. In present study recommended water temperature for the fish species was maintained within the range by thermostat (water heater).

Water conditions:- A regular monitoring of water quality parameters were done during culture and breeding period in all the tanks. Water exchange was also done when needed.

Cleaning of breeding tanks:- Before starting the breeding all the aquarium was thoroughly cleaned with fresh water and disinfected with potassium permanganate.

Planting: - As Neon tetra fish is an egg scatter having adhesive eggs. Therefore plants or plants substitutes (plastic mops) was placed in the breeding tanks. Plants also serve as a refuge for newly born live bearing fishes, protecting from the voracity of their own parents.

Breeding was conducted in glass aquarium of size 30” x 12” x 15” in April, 2016 and August, 2016. The glass aquarium was filled with dechlorinated fresh water. Water used for the tank was aged and conditioned. The filtration system is important to maintain the water quality in the neon tetra tank. A sponge filter was used. Some sterilized aquatic plants like hydrilla and plastic mop was placed in the breeding aquaria as fish often like to lay their eggs on them. The bottom of the tank was covered with small pebbles that sterilized in boiling water. Neon Tetra eggs and fry are sensitive to light. So that breeding aquarium was placed away from lights, and black paper was used to cover the sides of the aquarium.

Neon Tetra are a difficult fish to sex, however, there are two clear distinctions that separates both. Female Neon Tetras tend to be slightly longer and wider than male Neon tetras. The second thing to look for is coloring, females have a stripe slightly bent towards the bottom, while the male stripe runs straight up the body. When spawning is about to commence the males can be seen performing a dance like movement around the female and chasing the female through the tank foliage. The male and female will then come together; the female will lay eggs that are then fertilized by the male in the water. After the eggs have been laid remove the adult fish from the breeding tank as they have a tendency to eat the eggs. Eggs are sensitive to light so avoid direct sunlight on the tank and turn off any tank lighting until eggs have hatched. Excessive lighting can lead to the eggs being infected with bacterial diseases.

The water temperature was about 20-25⁰c and pH 6.2-7.2. Spawning took place after 28 hours (In April, 2016) and after 26 hours (In August, 2016). As soon as spawning was completed, the breeding pair was removed as the parents will quickly eat the eggs.

Result and Discussion:-

Table no.1 gives the water quality of the rearing water. Table show that the water quality remained more or less the same throughout the rearing and breeding period. All the parameters were within the range acceptable for fish.

In nature, neon tetras are omnivores that will eat both plant and animal material. In the present investigation foods offered were mixed food which contains natural planktons, earthworms, and prepared food (soybean flour+ Wheat flour+ mustered oil+ egg+ germinated gram+ salt+ calcium and mineral powder) and farax. Nandeesh et al (1994) reported that mixed feeding schedules were superior to the high protein of a single diet because nitrogen retention was high in fish fed with mixed schedules. The potential value of earthworm as a protein source had been established by several authors (Stafford and Tacon, 1988, Edward and Niederer, 1988, Ortega et. al., 1996). Farex was given as it is known to be the best food for the aquarium fishes because of its high digestibility and the resultant low metabolic wastes.

The breeding detail of Neon tetra is shown in table no.2. Breeding was conducted in two separate glass aquarium each of size 30” x 12” x 15” in April, 2016 and August, 2016. One pair of mature brooders was kept in each aquarium. The total number of eggs laid was 90 in aquaria-I and 96 in aquaria-II in April, 2016. In August, 2016 the total number of eggs laid was 110 in aquaria-I and 116 in aquaria-II. Fertilized eggs were transparent and they kept in water having temperature 25-26⁰c. Aerator was used for aeration. Hatching completed in 26-28 hours with hatching percentage 54% (in April, 2016) and 60% (in August, 2016). After about 36-38 hours of hatching the yolk sac of larvae were absorbed, they become free swimming and at this stage they fed with boiled egg. After 10th day fry were fed with Daphnia, small pieces of earthworm and prepared food. Average number of fry survived after 30 days of rearing was 67 i.e. 53% (in April, 2016) and 96 i.e.71% (in August, 2016).

It is concluded that Breeding of neon tetras is a challenging task, as they have specific requirements and delicate nature. This study will help in popularization of aquarium keeping in local area and in turn will help to set profitable small scale ornamental fish farm in small space and under the adverse climatic conditions (low and high temperature).

Table No. - 1

Physico-chemical parameters of water at the time of culture and breeding of Neon tetra

S.No.	Parameters	April-2016		August-2016	
		Rearing	Breeding	Rearing	Breeding
1	Water Temperature(0c)	20-25	22-24	25-27	22-26
2	Alkalinity (mg/l)	4.6-5.2	4.8-5.9	5.5-7.4	4.9-6.8
3	DO (mg/l)	7.0-7.5	7.2-7.6	7.1-7.6	6.8-7.3
4	CO2 (mg/l)	1.4-2.1	1.0-1.6	2.0-2.3	2.1-2.5
5	pH	6.2-7.1	6.7-7.2	6.7-7.0	6.6-7.2

Table No.2

The breeding detail of Neon tetra

S.No.	Particulars	Breeding in April-2016		Breeding in August-2016	
		Aquaria-I	Aquaria-II	Aquaria-I	Aquaria-II
1	Age of fish at spawning	18-19 months	18-19 months	21-22 months	21-22 months
2	Male : Female ratio	1 : 1	1 : 1	1 : 1	1 : 1
3	No. of pairs of brooder selected	1 pairs	1 pairs	1pairs	1pairs
4	No. of eggs laid	90	96	110	116
5	Hatching period	26-28 hrs	25-28 hrs	24-26 hrs	24-26 hrs
6	Hatching percentage	52%	54%	58%	62%
7	Average no. of fry survived after thirty days of rearing	32	35	42	54

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