



## Effect of Natrum Muriaticum in Inducing Spawning in the Ornamental Fish *Poecilia Sphenops* (White Molly)

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### Abstract

Reproduction in fishes is regulated by external environmental factors that trigger internal mechanism into action. Recent studies reveal that a homeopathic hormone *Natrum muriaticum* is found to be effective in inducing spawning in fishes. In the present study, Homeopathic medicine *Natrum muriaticum* used to induce spawning in the ornamental fish *Poecilia sphenops*. The fishes were introduced into water containing *Natrum muriaticum* 30 centesimal potency of dilution 0.025%. A control was also maintained simultaneously. The time taken for spawning in control and experiment groups were compared. From the result, it is inferred that the homeopathic medicine *Natrum muriaticum* has advanced spawning in experimental group of fishes. There was a considerable change in weight gain, fecundity and ammonia excretion in experimental fishes. We conclude that quality of the water should be maintained for the successful spawning and proper growth of the fishes.

**Keywords:** *Natrum muriaticum*, *Poecilia sphenops*, Homeopathic and spawning.

### 1. Introduction

Reproduction in fishes is regulated by external environmental factors that trigger internal mechanisms into action. The final event of the reproductive cycle, the release of eggs and spawning, can be controlled by either placing the fish in an appropriate environment or by changing the fish internal regulating factors with injected hormones or other substances. The internal mechanisms that regulate spawning are similar for most fishes. In many cases, much better results in controlled reproduction are obtained when pure or synthetic hormones are used for hormonal stimulation (Yaron, 1995). Ovaprim consists of a synthetic GnRH and domperidone in a liquid propylene glycol carrier. Ovaprim's synthetic GnRH closely resembles that of naturally occurring gonadotropic hormone. Ovaprim initiates the reproductive cascade and eliminates the need for a natural trigger. It is intended for using as a spawning

aid in reproductively mature conditioned fish. An understanding of ovaprim's mode of action and consideration for its use are critical for successive use of the drug during ornamental fish production. Similarly two types of hormones (Ovatide and Ovapel) are in testing condition (Jose, 2011). But all these hormones are synthetic and highly priced one. The preparation technologies of these hormones are also very tiresome.

#### **Natrum muriaticum**

*Natrum muriaticum* can be used to induce breeding in fish (Visakan et al., 2005). *Natrum muriaticum* is a homeopathic medicine obtained from rocky shore minerals. Chemically *N. muriaticum* is sodium chloride. The prolonged taking of excessive salt in human causes profound nutritive changes to take place in the system and their arise not only the symptoms of salt retention as evidenced by dropsies and oedemas, but also an alteration in the blood causing a condition of anemia and leucocytosis. In fishes *Natrum muriaticum* causes changes in the metabolic activities. As a result, the fish gain weight and rate of excretion of ammonia increases. Studies reveal that *N. muriaticum* is found to be effective in inducing breeding.

#### **Poecilia sphenops**

Nowadays the importance of *poecilia* is getting increased in the field of induced breeding. A number of favorable attributes including in small size, rapid development, commercial importance, easy availability, viviparous nature and easy breeding ability makes the poeciliids important. Molly is a tropical hardy and highly adaptable fish species that comes in many different colours and varieties such as white, black, orange, green, sailfin, balloon, etc. It was originated from the southern part of United States and Mexico. In India, poeciliids accounts for about more than 50% of the total market share in ornamental fishes (Mahapatra et al., 2000). Wild fishes of the genus *Poecilia* (Guppies and Mollies) are generally found in fresh and brackish water bodies such as streams, rivers, ponds and estuaries (Nordlie et al., 1992).

## **2. Materials and Methods**

### **Experimental animal**

*Poecilia sphenops* comes under molly group (white molly). Mollies are eager feeders and enjoy feeding on live vegetation along with flake type fish food. Mollies are friendly fish that seem to do well with many other breeds of fish except gold fish. Mollies grow to a length of 2 to 4 inches and can live two years, it's known for calm and peaceful nature. This work is designed to provide some important baseline information on the use of a natural product for the mass production of commercially important fishes.

### **Procurement of fish**

The experimental animals were collected from pet shops in Coimbatore District. Fishes were brought in polythene bags filled with oxygen. Fishes having an approximate length of 4-5cm were selected for the study.

### **Acclimatization**

The fishes were transferred to a glass aquarium and acclimatized to the laboratory conditions for a period of fifteen days. Water is changed frequently to maintain sufficient amount of oxygen and to get rid of toxic ammonia. The uneaten feed and fecal pellets were removed daily one hour after feed. Uniform sized fishes with identical maturity conditions were used for the experiment.

### **Procurement of *Natrum muriaticum***

The *Natrum muriaticum* solution of dilution 30 centesimal (30C) of brought from homeo medical shop – Janatha homeo medical centre in Ottapalam, Kerala. The above mentioned dilution was preferred as it is known as the typical potency with peculiar poetizing effect. From *Natrum muriaticum* 30 centesimal potency, 0.025% dilution was prepared (0.1ml *N. muriaticum* 30 centesimal potency was diluted to 0.025% by adding 400ml water.

### **Experiment**

The fishes were grouped into two sets containing 6 each. One set was treated as control and the other one as experimental. The control was maintained in glass aquarium and the experimental fishes in plastic trough. In the experiment, water with 0.025% *N. muriaticum* was added as the medium. The fishes were fed with pellet diet. During the course of experiment, the animals were weighted daily for a period of 9 months and the ammonia was estimated in the medium.

### **Estimation of Ammonia**

$$\left. \begin{array}{l} \text{Amount of ammonia} \\ \text{Present in the sample} \end{array} \right\} = \frac{\text{O.D of the Sample}}{\text{O.D of the Standard}} \times \text{Concentration of Standard}$$

### **Analysis of water medium**

The physical and chemical parameters of water like temperature, colour, pH, dissolved carbon dioxide, carbonates, bicarbonates, calcium magnesium, chlorine, phosphate and sulphates were analyzed.

### 3. Results and Discussion

#### Results

##### Effect of *Natrum muriaticum* on spawning

The present study deals with the effect of *Natrum muriaticum* on the duration for spawning, growth, fecundity and excretion. The results of the study revealed that 0.025% solution of *N. muriaticum* advanced the process of spawning in *Poecilia sphenops*. The experimental fishes released the young ones on the 21<sup>st</sup> day of their exposure to the experimental solution. On the other hand, the fishes maintained in the control released young ones only on 34<sup>th</sup> day of exposure. Table 1 and 2 represents the growth pattern shown by the control and the treated fishes. When the data was subjected to Student 't' test, it showed that there was a significant difference in the growth rates of the control and the treated fishes.

##### Weight Gain

The weight of the fishes in the control and treated fishes were given in the table 1 and 2. It is shown that the fishes maintained in the experimental setup gained more weight than the fishes maintained in the control.

##### Ammonia excretion

The ammonia content in the control and the experimental systems during the experimental days are recorded in the table 3. It is shown that there was a considerable increase in the rate of excretion of ammonia in the control and the experimental group during later stages of experiment. After 1 day of exposure, the amount of ammonia created was 0.0724g/hr and 0.1449g/hr for control and Experimental fishes respectively, after 3 days of exposure it increased to 0.2173g/hr and 0.5072g/hr.

##### Fecundity

The data on the young ones released by the control and the treated fishes during the course of the experiment are represented in the table 4. Student 't' test revealed that there was a significant difference in the number of young ones produced by the control and the treated fishes.

**Table 1:** Weight in grams in the treated fishes (*Poecilia sphenops*)

Growth	Weight (g)	Weight gain g/fish/day
0 <sup>th</sup> Day	2.80	-
1 <sup>st</sup> Day	2.94	0.14
2 <sup>nd</sup> Day	3.12	0.18
3 <sup>rd</sup> Day	3.43	0.31
4 <sup>th</sup> Day	3.88	0.45

**Table 2:** Weight in grams in the control fishes (*Poecilia sphenops*)

Growth	Weight (g)	Weight gain g/fish/day
0 <sup>th</sup> Day	2.80	-
1 <sup>st</sup> Day	2.88	0.08
2 <sup>nd</sup> Day	2.97	0.09
3 <sup>rd</sup> Day	3.09	0.12
4 <sup>th</sup> Day	3.24	0.15

**Table 3:** Ammonia content (g/hour) in the control and treated fishes

Day	Control fishes		Treated/ Experiment fishes	
	OD Value	Amount of Ammonia (g/hr)	OD Value	Amount of Ammonia (g/hr)
0 <sup>th</sup> Day	0	-	0	-
1 <sup>st</sup> Day	0.01	0.0724	0.02	0.1449
2 <sup>nd</sup> Day	0.02	0.1449	0.04	0.2898
3 <sup>rd</sup> Day	0.03	0.2173	0.07	0.5072
4 <sup>th</sup> Day	0.06	0.4347	0.10	0.7246

**Table 4:** Number of young ones released by control and experimental groups

Groups	Number of young ones released
Control	11
Experiment/ Treated	18

## Discussion

In the present study *Natrum muriaticum* 30 centesimal potency of dilution 0.025 has advanced the spawning in *P.sphenops*. For instance the time taken for spawning is four days in the one exposed to this medium when compared to the control which took eight days for spawning. Similar results are reported in goldfish by Vishakan et al., 2005. Injection of the *Natrum muriaticum* 1000 centesimal potency into the goldfish (1ml/kg) induced spawning within 22Hours against 5 days in the control. In the same way, Ovaprim induced breeding in Indian major carps at a dosage of 0.4 to 0.5ml per kg body weight (Roy, 1996). From the results, it is inferred that there is no significant changes in these characters. Hence the water is suitable for the growth and reproduction of the fish *Poecilia sphenops*.

## 4. Conclusion

*Natrum muriaticum* increases the metabolic activities of the fish and there by influences the spawning process. *Natrum muriaticum* effects on the weight gain, fecundity and ammonia excretion of the fishes. Use of *N. muriaticum* as spawning agent should be encouraged as it is cost effective, simple and gives good results.

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