

## EFFECT OF INORGANIC FERTILIZER (NITROPHOS) APPLIED AT 0.2 g N/100 g OF FISH BODY WEIGHT DAILY ON THE GROWTH PERFORMANCE OF MAJOR CARPS (*Labeo rohita*, *Catla catla* and *Cirrhinus mrigala*)

Tanveer Asghar, Iftikhar Ahmed, Pervez Akhtar<sup>1</sup> and Sumaira Abbas

Department of Zoology and Fisheries,

<sup>1</sup>Department of Animal Breeding and Genetics,

University of Agriculture, Faisalabad-38040, Pakistan

### ABSTRACT

The experiment was conducted to assess the effect of inorganic fertilizer (nitrophos) on the growth performance of major carps, *Labeo rohita*, *Catla catla* and *Cirrhinus mrigala*. The initial average body weights of these three fish species in both control and treated ponds were 78.9, 68.2 and 102.6 g and 77.9, 68.5 and 104.5 g, respectively. Fertilization of treated pond was done by nitrophos at the rate of 0.20 g N/100 gm of fish body weight daily. The overall average weight gain of control and treated ponds were 106.60, 80.2 and 126.1g and 511.2, 490.2 and 560.5g, respectively of three fish species. Net fish yield (all the species together) in control and treated ponds were 13.937 and 69.292 Kg/pond/year, respectively. The fish production/ha/year were to be 290.307 and 1443.35 Kg in control and treated ponds, respectively. Treated pond showed 4.97 time greater net fish production as compared to that of control pond.

**Keywords:** *Labeo rohita*, *Catla catla*, *Cirrhinus mrigala*, growth performance, nitrophos

### INTRODUCTION

The importance of inorganic and organic fertilizer for improving the productivity of fish ponds have been emphasized by Boyd (1981). Rebreanu *et al.* (1980) studied that the maximum production of fish can be obtained by the use of inorganic fertilizers, i.e., ammonium nitrate and super phosphate. The modern fertilizers which contains biogenous elements (nitrogen and phosphorus) stimulate the growth of primary productivity of the pond and ultimately the fish production (Viola *et al.*, 1986).

Ali (1997) studied the effect of nitrogen and phosphorus fertilizers on the growth performance of major carps. Fertilizers, urea and single superphosphate were added in both ponds in the ratio 1:1 on the basis of 0.12% N of body weight of fish and 0.012g N/cm of body length daily. Inorganic fertilizer exerted highly significant influence on body weight, fork length and total length gain of fish.

In view of tremendous significance of fertilizers, the present study was designed to determine the effect of inorganic fertilizer (nitrophos) on growth performance of major carps.

### MATERIALS AND METHODS

The experiment was conducted for the period of nine months in two earthen ponds, as one is a treated pond and other is control, each of area 0.048 ha, situated at Fisheries Research Farms, University of Agriculture, Faisalabad. The stocking rate was 40 *Labeo rohita*, 30 *Catla catla* and 30 *Cirrhinus mrigala* per pond. At the time of stocking, wet body weight was measured. After next day of stocking, fertilization of treated pond was done on the basis of nitrogen derived from inorganic fertilizer (nitrophos) at the rate of 0.2 gm N/ 100 gm of fish body weight daily. In treated pond fertilization was done weekly. Fish samples were taken randomly from each of the ponds after every month by a nylon net and their body weight was measured. After recording data, fish were released back into their respective ponds.

### RESULTS AND DISCUSSION

The average weight gain of *Labeo rohita* in control pond was 106.6 gm and in treated pond was 511.2 gm where as the average weight gain in *Catla catla* were 80.2 gm and 490.2 gm in control and treated

ponds. In case of *Cirrhinus mrigala* the increase in average weights in control and treated ponds were 126.1 gm and 560.5 gm. (Table 1).

In control pond *Labeo rohita* gained maximum weight of 21.1 gm in April, *Catla catla* and *Cirrhinus mrigala* gained 17.5 and 23.9 gm in March, respectively. However, in treated pond *Labeo rohita* gained maximum weight of 120.4 in April, *Catla catla* and *Cirrhinus mrigala* gained maximum weight in March as 130.5, 118.9 gm, respectively (Table 1). This could be as a result of optimum temperature. The minimum increase in weight in control pond was 3.8 gm of *Labeo rohita*, 2.9 gm of *Catla catla* in the month of January and *Cirrhinus mrigala* 4.4 gm in the month of December. While in the treated pond, the minimum increase in weight was observed during December for *Labeo rohita*, and *Cirrhinus mrigala*, as 12.6 and 22.7 gm, respectively. The minimum increase in weight of *Catla catla* was 13.4 gm in the month of January due to low temperature. (Table 1)

Analysis of variance showed that there was highly significant difference among the weights gained in fish under the control and treated ponds (Table 2). The difference in average body weights of three fish species were statistically significant. Highly significant interaction between M X T indicated variable responses

of treated against control pond during various months. The interaction between S X T was highly significant which showed that there was a great difference between species and months and therefore, it showed that growth rate of fish varied during different months of the year (Table 2). The net fish production of three fish species in control and treated ponds were therefore, recorded as 290.307 and 1443.352 Kg / ha / year, respectively. As a result of treatment there was a 4.97 times greater net fish production as compared to that of control pond.

In the present study, it was observed that the maximum weight gained in major carps (*Labeo rohita*, *Catla catla* and *Cirrhinus mrigala*) was in treated pond, fertilized with nitrophos. These results were in line with results obtained by many workers (Abdalla, 1997; Mahboob and Sheri, 1997; Tarar, 1997 and Mateen *et. al.*, 2001). Abdalla, (1997) stated that for improving the hygienic conditions and primary production, nitrogen and phosphorus fertilizers are widely used in fish ponds. Tarar (1997) obtained 3515 kg/ha/year net fish production from a pond treated with Urea as source of nitrogen which had a better nitrogen incorporation efficiency.

**Table 1: Monthly increase in body weight (g) of major carps in control and treated pond**

DATE	<i>Labeo rohita</i>				<i>Catla catla</i>				<i>Cirrhinus mirrigala</i>			
	Control		Treated		Control		Treated		Control		Treated	
	Av. Wt	Inc. Wt	Av. Wt	Inc. Wt	Av. Wt	Inc. Wt	Av. Wt	Inc. Wt	Av. Wt	Inc. Wt	Av. Wt	Inc. Wt
02-10-96	78.9	----	77.9	----	68.2	----	68.5	----	102.6	----	104.5	----
02-11-96	86.6	7.7	100.5	22.6	47.8	6.6	83.9	15.4	112.3	9.7	138.4	33.9
02-12-96	92.3	5.7	128.3	27.8	80.9	6.1	101.7	17.8	121.8	9.5	167.7	29.3
02-01-97	97.1	4.8	140.9	12.6	84.5	3.6	116.9	15.2	126.2	4.4	190.4	22.7
02-02-97	100.9	3.8	159.2	18.3	87.4	2.9	130.3	13.4	132.9	6.3	213.9	23.5
02-03-97	110.5	9.6	213.1	53.9	92.6	5.2	154.9	24.6	143.3	10.4	254.4	40.5
02-04-97	126.0	5.5	285.9	72.8	110.1	17.5	285.4	130.5	167.2	23.9	373.3	118.9
02-05-97	147.1	21.1	409.3	120.4	126.7	16.6	413.7	127.7	189.7	22.5	480.5	107.2
02-06-97	166.6	19.5	501.6	95.3	139.5	12.8	506.2	93.1	211.8	22.1	580.3	99.8
02-07-97	185.5	18.9	589.1	87.5	148.4	8.9	558.7	52.5	228.7	16.9	665.0	84.7
Overall Av. Wt. gain (g)	106.6		511.2		82.2		490.2		125.1		560.5	

**Table 2: Analysis of variance of body weight of major carps in control and treated ponds**

SOV	DF	SS	MSS	F Value
Treatment	1	277399.196	277399.196	2596.5236**
Month	9	596143.615	66238.179	620.0054**
Month x Treatment	9	268593.184	29843.687	279.3441**
Species	2	54433.689	27221.845	254.8031**
Species x Treatment	2	4035.576	2017.788	18.8870**
Species x Month	18	6470.05	359.472	3.3647*
Error	18	1923.027	106.835	
Total	59	1209008.792		

\*\* = Highly significant; \* = Significant

## REFERENCES

- Abdalla, A. H., 1997. Effect of increased nitrogen fertilization on water quality and yield of Nile tilapia (*Oreochromis niloticus*) and common carp (*Cyprinus carpio*) in earthen ponds in Egypt. *J. Applied Aquaculture*, 7: 1-14.
- Ali, A.S., 1997. Fish pond fertilization: Effect of dose differences on pond fisheries. M.Sc. Thesis, Deptt. Of Zoology and Fisheries, Univ. of Agri. Faisalabad, Pakistan. pp: 103.
- Boyd, C.E., 1981. Water Quality in Warm Water Fish Ponds (2<sup>nd</sup> Ed) Craftmaster Printers, Inc., Opelika, Alabama. USA. pp: 359.
- Mahboob, S. and A. N. Sheri, 1997. Growth performance of major, common and some Chinese carps under composite culture system with special reference to pond fertilization. *J. Aquaculture in Tropics*, 12: 201-207.
- Mateen, A., M. Afzal, and I. Ahmad, 2001. Comparison of two nitrogen fertilizers supplemented on the basis of body length of fish with special reference to fish production. *J. Biological Sci.*, 1(8): 713-714.
- Rebreanu, L., M. Bura and V. Gorgon, 1980. Effect of adding organic and inorganic fertilizers to pond on fish production. *Lucari Scientific Institute Agrionomics Timisoara. Zoototirie*, 17: 145-147.
- Tarar, S. R., 1997. Comparison of fish length and weight based doses of inorganic fertilizer in pond fisheries. M.Sc. Thesis, Deptt. Of Zoology and Fisheries, Univ. of Agri. Faisalabad. pp:78.
- Viola, S., G. Zohar and Y. Ariel, 1986. Phosphorus requirement and its availability from different sources for intensive pond culture species in Israel. *Bamidgen*, 38: 3-12.