

# Observations on the Effect of Feeding *Labeo rohita* (Ham.) with *Microcystis* *aeruginosa* Kütz

by

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## INTRODUCTION

The importance of algae which form major fish food has been realized in fish farming during the current years. Recently, a number of attempts have been made to study the feeding habits of freshwater fishes. Among algae, the blue greens form a better source of food for the fishes than other plants (SINGH, R. N., 1961). There is diversity of opinion regarding the toxicity of *Microcystis aeruginosa* on freshwater fishes. The toxic effect of *M. aeruginosa* on freshwater fishes has been reviewed by PRESCOTT (1948), INGRAM & PRESCOTT (1954) and SCHELUBSKY (1951) etc. But the investigations made in India have shown that the alga is not toxic to freshwater fishes (GANAPATI, 1940, 1956, 1960; SINGH, 1958; KRISHNAMOORTHY, 1961 and GEORGE 1962 etc.). The author himself studied a permanent fishery pond at Kanpur for two years containing a number of fishes of commercial importance with a bloom of *M. aeruginosa* causing no mortality of fishes.

The present investigation has been made to study the utility of *M. aeruginosa* as fish food for *Labeo rohita*, an important Carp of India, while dealing with the problem entitled "Studies on algae with special reference to freshwater fishes of Kanpur".

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## MATERIAL AND METHODS

The fingerlings of *Labeo rohita* were obtained from the local Government nursery. The fishes were acclimatized to laboratory conditions and controlled feeding experiments were carried out in rectangular jars containing 3 litres of water. The experiment was set in triplicate. The fishes were starved for about 48 hours to clear their gut contents. The experiments were then set up in three jars each containing four fishes. One of the jars contained *M. aeruginosa* and tap water, the other contained *Hydrilla* sp. with pond water, thus simulating almost natural condition and the third jar contained tap water only. The second and third jars were used as control. *M. aeruginosa* used for the experiments was collected from a permanent pond. The water was well aerated and was not changed during the experiments. The experiments were continued for a week and weight, volume and measurements of fishes were taken before and after the experiments. The weight was taken by transferring the fish to a beaker containing a weighed quantity of water. The beaker was then weighed on a chemical balance. The volume was determined by transferring the fish to a measuring cylinder. The fishes were measured to the nearest millimeters. To determine the condition of alga, excreta was examined daily.

## OBSERVATIONS

The effect of feeding *M. aeruginosa* on the weight, volume and size of *Labeo rohita* is recorded in Table I.

Table I shows that there is an increase of 31.11% in weight, 12.5% increase in volume, 1.923% increase in length and 5.05% increase in breadth of fishes in the jar No. 1 fed with *M. aeruginosa*. Fishes in jar No. 2, simulating almost natural conditions also show an increase of 19.189% in weight, no increase in volume, 0.406% increase in length and 2.857% in breadth. This shows that the effect of feeding the fishes with alga is very marked as compared to the fishes kept in jar No. 2. The fishes kept in jar No. 3 were practically starved and lost 20.90% in weight, 12.5% in volume and 6.33% in breadth. However, there was no change in the length of the fishes. No mortality of the fishes occurred during the experiments. The general behaviour of fishes was better in jar No. 1 and 2 as compared to jar No. 3. An examination of the excreta in jar No. 1 showed cells of *M. aeruginosa* in various stages of disintegration.

## DISCUSSION

The results of the present study indicate that feeding with *M.*

TABLE I

*The effect of feeding Labeo rohita with Microcystis aeruginosa.*

Type of water and inoculum	Initial weight of fishes in g.	Final weight of fishes in g.	Difference in weight.	Percentage increase or decrease in weight	Initial volume in ml.	Final volume in ml.	Difference in Volume
Jar No. 1 Tap water and <i>M. aeruginosa</i>	4.5600	5.9790	1.4190	31.11 +	4.00	4.5	0.5
Jar No. 2 Pond water and <i>Hydrilla</i> sp	5.1590	6.0490	0.9900	19.189 +	4.00	4.00	Nil
Jar No. 3 Tap water CONTROL	4.4690	4.3390	0.1300	20.90 —	4.00	3.5	0.5

*aeruginosa* has a beneficial effect on growth and development of fingerlings of *Labeo rohita*. There is overall improvement in the general condition, increase in weight, volume and size of fishes fed with the alga. The disintegrated cells present in excreta; in different stages show that the alga is being utilized by the fishes as food. The beneficial effect of *Microcystis aeruginosa* may be ascribed to the high nutritive value as the alga contains 53.12% crude protein (SINGH, R. N., 1961).

It would be interesting to compare the results of the present observation with the literature available on the role of algae as fish food. The effect of feeding *Puntius ticto* (HAM.) and *Trichogaster fasciatus* DAY with *Scenedesmus obliquus* (TURPIN) KUETZING (GUPTA & AHMAD, 1964 and GUPTA & AHMAD, 1966) *Cirrhina mrigala* (HAM.) with *Microcystis aeruginosa* (AHMAD, 1966) have shown that the algae impart an improved fish growth.

The findings of the present study are in conformity with the previous work and suggest that the feeding of fishes with algae rich in proteins yields significant improvement in general conditions and growth of fishes.

Percentage increase or decrease in volume	Average initial measurements in cm.		Average final measurements in cm.		Difference in measurements		Percentage increase or decrease	
	Length	Breadth	Length	Breadth	Length	Breadth	Length	Breadth
12.5 +	5.2	0.95	5.30	1.0	0.1	0.05	1.9230 +	5.05 +
Nil	5.425	0.875	5.450	.85	0.025	0.025	0.406 +	2.857 +
12.5	5.75	0.825	5.75	.775	Nil	0.050	Nil	6.33

#### SUMMARY

Controlled feeding experiments were carried out with *Microcystis aeruginosa* to study its effect on the fingerlings of *Labeo rohita*. The observation reveals an overall improvement in the general condition and a marked increase in weight, volume and size of fishes as compared to control.

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