STUDY OF GROWTH PATTERN OF SOME FISHES IN WATER RESERVOIRS OF EAST CHAMPARAN DISTRICT OF NORTH BIHAR

[1]Dr. Subodh Kumar and [2]Dr. S.K.Gupta

[1]Teacher, Govt. U.H.S.Teliya, Kudhani, Muzaffarpur - 844127

[2]Professor (Retd.) P.G.Department of Zoology, B.R.A.Bihar University, Muzaffarpur.

Abstract : There has been an increasing demand of fishes as dietary supplement all over the world. In this context commercial production of fishes is time demand .Both government and private sectors are encouraging fish production in our country to meet the consumer's demand. Keeping in view the above fact,the present paper aims at study of growth pattern of some fishes in water reservoirs of East Champaran district of North Bihar particularly in Sirrha Chorma reservoir .For this three species of fishes viz –*Catlacatla (ham), Labeorohita (ham)* and *Cirrhinusmrigala(ham)* are taken in this account. These fish species were stocked @ 7000 fingerlings/ha with the stocking ratio of 40:30:30 between 27-30 august 1999. At the time of stocking average weight and length were 4-6(5.1)gm and 72.77(74.5)mm Catlacatla.3.5-4.8(4.3)gm and 63-67(65)mm length of Labeorohita and 3.0-4.0(3.71)gm and 60-64(61.9)mm length of Cirrhinusmrigala. They were at first kept in hapas "fixed on bamboo pole in the reservoir for 10 to 12 days prior to release in the water supplementary feeding"was provided at 1.5% of the body weight, sampling of fishes was done between 28 to 30 November and 25 to 28 January and 27 to 29 March and 28 to 30 June 2000 to record increased length and weight of the three fishes. After harvesting, it was found that Catlacatla showed increased length and weight as in 321mm and 674gm Labeorohita, 396.7mm and 613.4gm Cirrhinusmrigalaas 341.5 mm and 363.3gm.

Keywords: Water Reservoir, Productivity, Growth pattern.

I. INTRODUCTION

About 40% of the total earth's surface contain fresh water, out of which only 0.2% (i.e. 2.0×10^6 km^2) area is covered by lakes/reservoirs, streams and rivers and almost some area by swamps and marshes. India has a rich variety of inland fisheries resources in the form of extensive river system throughout the country apart about 2.2 million hactare of ponds and direct water etc. All these together have a good potential to place the country among the top fresh water fish producing countries of the world. However, there has been a wide gap between its actual potentiality as the overall yield is much below the optimum level of production. The shortage of fish production in India may be due to under utilization of resources. Earlier, no much attention was taken by the government and private sector to develop fish culture on scientific basis. But recently both private sector and government are giving attention to promote fish production.

The North Bihar region is a low lying flood plain area situated at $25^0$55'- $27^0$31' latitude and $85^0$20' - $88^0$17' longitude and about 51-53 meter altitude from the sea level. The state is roughly quadrilateral in shape and has tropical and monsoon climate. The state in general and North Bihar in particular has very large number of rivers and their tributaries/lakes/reservoir and ponds excluding 'Chours' and low lying land. As far their utilization for fish culture is concerned, it is far behind than other states. The proper and scientific methods for fish production has not been yet adopted by the government or fish farmer`s society.

Considering the above mentioned facts, it becomes necessary to study the growth pattern of some fishes in the water reservoirs of North Bihar particularly in East Champaran district. As we know that the various factors biotic and abioticassociated with water reservoirs play an important role in production of aquatic fauna and florabecomes necessary to study of growth /patterns of fishes in the water body.

The productivity of water body depends on the quality of water and soil apart from presence of animals and plants. The importance of primary productivity is well realized in view of its value in estimating the production capacity. Unfortunately our knowledge of primary productivity of water bodies of tropics is meager except for few works [Shreenivasan 1965, Naser and Munshi 1975, Mathew 1977] while comparatively much attention was taken in temperate zones.

The present paper aims at study of the growth patterns of some important fishes in water reservoirs in East Champaran district in Bihar.

Benthic founa is also an important source of food for fish in aquatic bodies. The distribution and abundance of particular species may differ according to season. These fauna increase the understanding of benthic environment, its communities and productivity [Hyne 1961, Allan 1976, Marshall 1978, Bose 1986, Arcifa et.al. 1992]. But only a few attempts have been made in Indian water bodies [Arora 1966, Mandal and Moitra 1975, Bhowmik 1987, Chaudhry 1999] where as a comparative knowledge about this fauna is an essential prerequisite for any systematic fish-culture programme.

II. MATERIALS AND METHOD

For the present study, the materials were collected fortnightly from three arbitrary selected sight of Tetaria and Sirrha Chorma reservoirs respectively, keeping the abiotic and biotic factors in the background. However, to study the growth of the fish and fish fauna, the whole reservoirs were considered with fixing any site. Water were collected fortnightly while soil samples and physiological parameters were recorded on monthly seasonal basis. Growth patterns of fish were done in Sirrha Chorma reservoir only after introducing fingerlings of *Catla catla, Labeo rohita, Cirrhinus mrigala* up to 10 months while fish fauna were recorded on the basis of fish catches in whole year.

Methods used for different parameters

During the present study following methods were used in the laboratory as well as in the field as described in detail of the APHA (1985), Gottermanet. Al. (1978), Welch (1948), Munshi and Munshi (1995) and for soil analysis, after Jackson (1967) and Piper (1950).

Physical factors like – Temperature, Day-length, Rainfall and humidity were recorded accordingly. For measurement of transparency of water formula:-

Transparency (cm)=Depth of disappearance + depth of reappearance/2

Chemical factors like –PH, DO_2 (dissolved oxygen), free CO_2, total hardness of water, total alkaline, phosphate level, nitrate level etc. were recorded. BOD and COD of water was also measured.

Also, biotic factors including Phytoplanktons and Zooplankton were analysed. The number of Planktons/litre was calculated by using the formula.

$$N= a \times c \times 1000/v$$

Where

a = number of plankton in1ml of sample filling sedjiwick Refter cell counter.

c = ml. of plankton-setting volume of plankton

In the same way zooplantonic observation was also made for the purpose.

Fish Fauna

Regular recording of fish fauna was done from the catch of the local fishermen in both the reservoirs altogether a year and consolidated list of the fish present was recorded.

III. OBSERVATION AND RESULT OF GROWTH PATTERN (GROWTH RATE) OF FISHES

In Sirrha Chorma reservoir, fingerlings of *Catla catla (ham)*, *Labeo rohita (ham)* and *Cirrhinus mrigala (ham)* were stocked @7000 fingerlings/ha with the stocking ratio of 40:30:30 between 27 to 30 August 1999. At the time of stocking the avenge weight and length were 4to 6 (5.1) gm and (72.7) (74.5) mm Catla, 3.5 to 4.8 (4.3) gm and (63-67) (65) mm length of *Labeo* and 3.0 to 4.0(3.71) gm and 60-64 (61.9) mm length of *Cirrhinus*. They were at first kept in hapas fixed on bamboo poles in the reservoir for 10-12 days prior to release in the water. During thisperiod the fingerlings were provided with supplementary feeding at 1.5% of the body weight of the fish as a mixture of groundnut oil cake and rice bran at 1:1 ratio. To study the fish growth, fish were sampled in between 28 to 30 November, 25-28 January, 27-29 March and 28-30th June to record the weight and length of the three species.

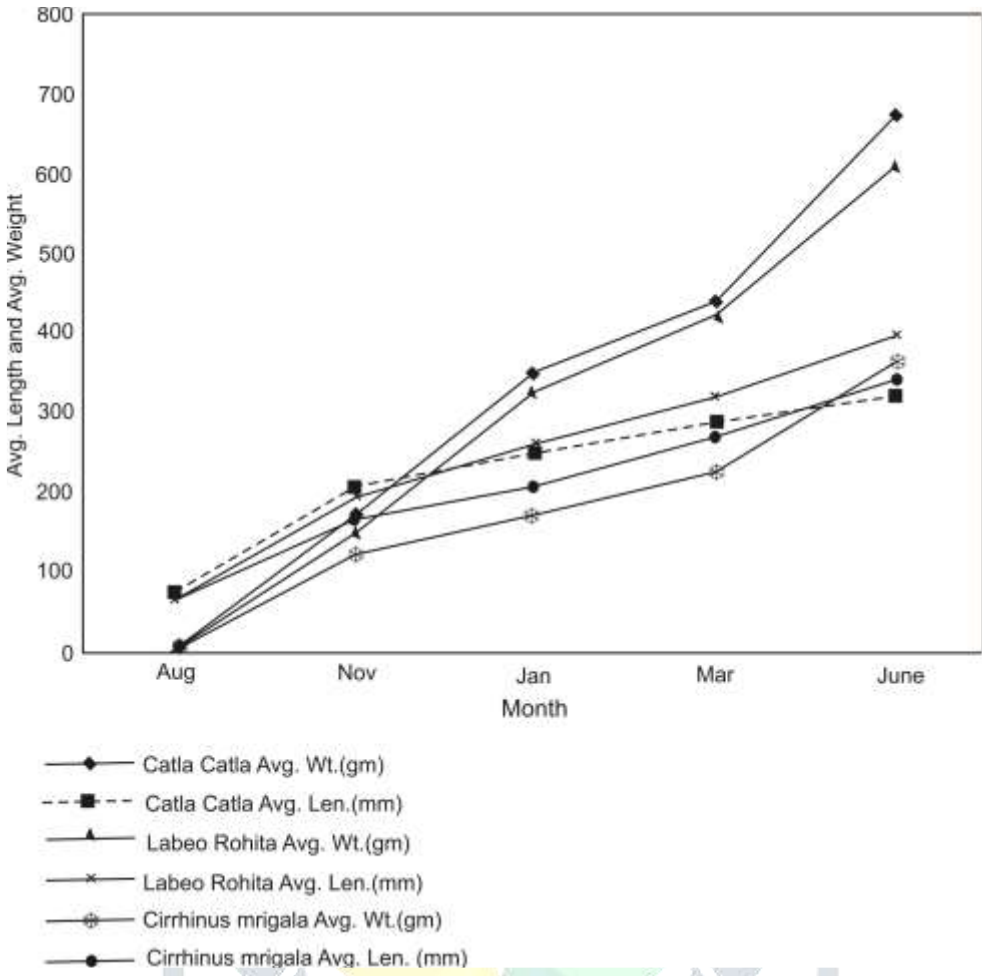
The data has been given in the table -01 and graphic representation is also furnished in fig -01.

Table - 01

Stocking & harvesting details with growth rate of major carps in Sirrha Chorma Reservoir during 1999-2000

Date of Experiment	Growth Rate of Major Carps			
		Catla-catle	*Labeo rohita*	*Cirrhinus mrigala*
	Stocking density	7000 Finger lings/ha		
27 to 30 Aug. 199	Av. Weight(gm)	4-6[5.1]	3.5-4.8[4.3]	3.0-4.0[3.7]
	Av. Length(mm)	72-77[74.5]	63-67[65]	60-64[61.9]
28-30 Nov. 1999 (Sampling)	Av. Weight(gm)	165-190[171.4]	144-171[148.7]	110-132[120.5]
	Av. Length(mm)	200-218[206.2]	183-199[191.5]	156-177[166.0]
25-18 Jan. 2000 (Sampling)	Av. Weight(gm)	345-372[350.9]	310-344[327-2]	154-183[170.8]
	Av. Length(mm)	235-260[251.6]	248-272[261.9]	197-216[208.4]
27-29 Mar. 2000 (Sampling)	Av. Weight(gm)	427-454[440.0]	404-433[422.7]	216-232[223.0]
	Av. Length(mm)	278-305[287.3]	306-330[319.8]	262-285[269.5]
28-30 June 2000 (Harvesting)	Av. Weight(gm)	660-692[674.9]	594-628[613.4]	349-371[363.3]
	Av. Length(mm)	313-335[321.4]	377-410[396.7]	324-352[341.5]

FIG - 01 : GRAPH SHOWING GROWTH PATTERN & LENGTH-WEIGHT RELATIONSHIP OF MAJOR CARPS FROM AUGUST 99 TO JUNE 2000 IN SIRRHA CHORMA RESERVOIR



IV. CONCLUSION

In the present study, as far fish growth pattern is concerned only in Sirrha Chorma reservoir was selected and accordingly *Catla catla, Labeo rohita, Cirrhinus mrigala* were selected for the study. The stocking density was @7000/ha out of which the stocking ratio was 40:30:30. The fingerlings of average weight group of 5.1,4.3, and 3.7 gm respectively were released at first in hapas for 10-12 days with artificial feeding and then released in water in natural habitat. They were sampled on every 2 months and after 10 months the weight group of *Catla catla, Labeo and Cirrhinus* became 660-692 (av.674.9), 594-628 (av.613.4) and 349-371(av.363.3) gm respectively. However, during this it was observed that the growth of fish was comparatively slower during winter months. Considering all the above mentioned factors in mind, definitely the reservoir is highly productive.

REFERENCES

[1] Ahamed, I. (1998) :Seasonalvariation in some physio-chemical properties of a pond with special reference to its productivity. Ph.D. Thesis, BRA Bihar University, Muzaffarpur{Bihar}.

[2] Allan,J.D. (1976) life history pattern in zooplankton.TheAmericanNaturalist,110: 165- 180.

[3] A.P.H.A. (1985): "Standard Methods for the Examination of water & waste water", A.W.W.A. & W.P.C.F. Am. Publ. Hlth. Assoc. Inc. Washington, D.C.{16thEdn.}.

[4] Arcifa, M. S. ; Gomes, E.A.T. & Meschiatti. A.J. (1992) : Composition of fluctuations of a tropical Brazilian reservoir.Archiv.Fur.Hydrobiology,123:479-495.

[5] Bhowmik,M.L. & Tripathi, S.D. (1985) : On the plankton & fish growth on ponds under semi Intensive fish culture in acid soils of Jalpaiguri, W. Bengal .J.Inland Fish.Soc.India.,17{1&2}:39-47.

[6] Bose, S. K. (1968) : Ecological studies of some fishes of Ranchi with special reference to Hydrology, Plankton & Pedon. Ph.D. Thesis, Ranchi Univ., Ranchi.

[7] Choudhary, M. (1999) : A study of the interaction of biotic and abiotic pools in an oxbow lake Of Gandak basin. Ph.D. Thesis, B.R.A.Bihar University Muz. India.

[8] Dwivedi, R. (1994) : Ecology & Productivity of the Gopala reservoir of Narkatiyaganj with special references to fishes . Ph.D. Thesis, B.R.A. Bihar University Muz. (India).

[9] Mandal, B.K. & Moitra, S.K. 1975: Studies on the bottom fauna in tropical fresh water fish pond at Burdwan (W.B.) J.Inland.Fish.Soc.India,7: 45-48.

[10] Mathew, P.M. (1977) : Primary productivity of Govindgarh lake. Indian. J. Anim. Sci. 47(6):349-356.

[11] Munshi, Mrs. J.S.D. & Munshi, J.S.D. (1995) : Fundamentals of freshwater Biology Narendra Publ. House Delhi (India).

[12] Naser, S.A.K. (1978): Diurnal movements of zooplankton in a freshwater pond in Bhagalpur. Bangiadesh J.Zool. , 6(2):91-95.

[13] Shreenivasan, A. (1965) : Limnology of tropical impoundments. Limnology of Amaravati reservoir, Madras, India. Hydrobiologia, 26:501-516.

[14] Sinha, V.R.P. & Gupta, V.; Banerjee, M.K. &Kumar, D. (1983) : Composite fish culture of Kalyani(W.B.). J. Inland Fish Soc. India. , 5:201-207.