PRODUCTIVITY AND SEASONAL ABUNDANCE OF COMMERCIALLY IMPORTANT FISHES OF GOBINDSAGAR RESERVOIR

*N. A. GEORGE, **A. A. KHAN, *O. P. PANDEY & ⅏T. JOSEPH MATHAI

Central Institute of Fisheries Technology Unit, Nangal.

Fishing experiments with gill nets were carried out at different centres of Gobindsagar reservoir through the years 1964-70. The seasonal abundance of main species of fishes and their zone of distribution were studied. *Labeo diplostoma, Labeo bata, Barbus tor* and *Mystus seenghala* are the main fish species of the reservoir. The abundance of the above species were observed to be the highest towards the Lunkhar arm of the reservoir.

INTRODUCTION

Znamensky (1967) had reviewed the fishery and biological conditions of the Gobindsagar reservoir and had reported the results of fishing operations conducted at 18 fishing centres with gill nets of three different mesh sizes during the period December, 1963 to July, 1964. Seasonal abundance of the main species of fishes and their area of concentration have, however, not been discussed and this information which is essential for the efficient management of the fishery of the reservoir is lacking. The results of the fishing investigations conducted with gill nets of varying mesh sizes at different centres through the years 1964 - 1970 are presented in this paper. The relative abundance of commercially significant species of fishes have been assessed in relation to the three main fishing zones of the reservoir. Intrazonal abundance has also been assessed with regard to the upper and lower reaches of the most productive fishing zone *viz.* the Lunkhar arm of the reservoir. Seasonal abundance of the different species has also been dealt with in this communication.

MATERIALS AND METHODS

Bhatnagar (1964) and Znamensky (*op. cit.*) while describing the Gobindsagar reservoir have divided the fishing grounds into three main zones namely, Lunkhar arm, River course, and Sir arm (Fig. 1). The two arms of the River Sutlej are formed with the rise in water level, by extension of a number of seasonal rainfed streams known as 'khads'. The grounds of Lunkhar arm are further demarcated into two sub zones at its upper and lower reaches.

Simple gill nets of hung length 75m. having a fishing height of 2.58 m. made of Kapron twines, 34/6, 34/9, 200/9 and nylon 210/2/3/ in mesh sizes 40.0, 45.0, 47.5, 50.0, 52.5, 55.0, 63.0 and 75.0 mm. bar were operated during the investigations. The design specifications of the gear and the details of fishing operations were as described by Khan, George and Pandey (1975). The fishing operations were adjusted in such a way as to minimise the effect of chance factor. Morphometric data such as length and weight of different species of fish caught by each net on each day from each centre were recorded. The comparative abundance of fish in the three main fishing zones and the percentage distribution of the four main species of fishes of the different fishing centres were worked out based on the data collected during 1964. The catch per unit area of 100 m² of net at the upper and lower reaches of Lunkhar arm have been estimated. The percentage composition of the main species of fishes of the reservoir and their seasonal abundance were tabulated from the total landings recorded during the years 1964-1970.

RESULTS AND DISCUSSION

The catch per unit area of net for the three main fishing zones for the upper and lower reaches of the Lunkhar arm is given in Tables I a and I b, respectively. The abundance of catch was greater at the zone of Lunkhar arm in general and its upper reaches in particular.

The proportionate increase of landing from Lunkhar arm was 8.96 and 2.46 times higher than that of River course and Sir arm respectively. The catch per unit area of net from upper reaches of Lunkhar arm was 2 67 times more than from its lower reaches. Among the three main fishing zones Lunkhar arm is shallower, followed by Sir arm and River course. The upper reaches of Lunkhar arm is shallower than its lower reaches. Znamensky (*op. cit*) has also reported higher rate of landings from shallower grounds of the reservoir. The deepest zone consisting of the River course was observed to be the least productive recording the lowest efficiency index (Table I a).
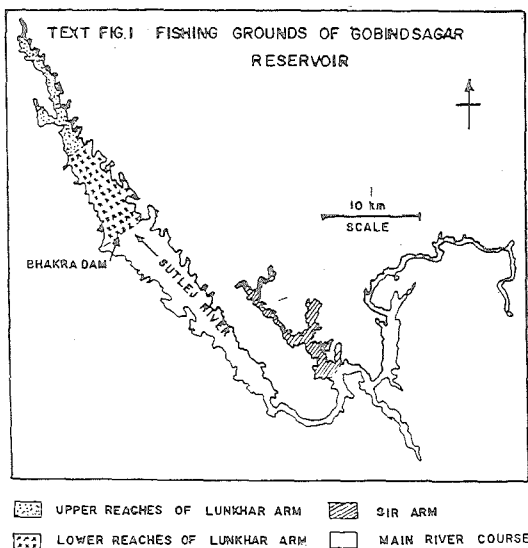

TEXT FIG.1 FISHING GROUNDS OF GOBINDSAGAR RESERVOIR

10 km
SCALE

BHAKRA DAM

▦ UPPER REACHES OF LUNKHAR ARM ▨ SIR ARM
▧ LOWER REACHES OF LUNKHAR ARM ☐ MAIN RIVER COURSE

TABLE I a

COMPARATIVE PRODUCTIVITY OF THREE MAIN FISHING ZONES

Fishing zones	Lunkhar arm	River course	Sir arm
Year of observation	1964	1964	1964
Total number of observations	130	80	90
Total area of nets operated m²	1,99,305	1,52,865	1,83,825
Total weight of fish kg.	13,465	1,160	5,070
Catch/100 m² of net kg.	6.790	0.758	2.758

TABLE I b

COMPARATIVE PRODUCTIVITY OF UPPER AND LOWER REACHES OF LUNKHAR ARM

Fishing area	Upper reaches of Lunkhar arm	Lower reaches of Lunkhar arm
Period of observation	1964 - 1970	1964 - 1970
Total number of observations	231	195
Total area of nets operated m²	4,54,725	4,67,883
Total weight of fish kg.	28,838.50	11,094.00
Catch/100 m² of net kg.	6.341	2.371

In Table II the percentage composition of the main species of the reservoir for each year, and the average for the years, are given. The catch consisted of four main species of fishes namely *Labeo diplostoma*, *Labeo bata*, *Barbus tor* and *Mystus seenghala* and they represented 62.78, 15.34, 11.71 and 5.22% respectively. *Barbus tor* and *Mystus seenghala* are the predatory species while the other two are non predatory species.

The monthwise landing of the different species and their percentage composition at different centres during the years 1964-1970 are given in Table III.

It may be noted from Table III that *Labeo diplostoma* is well represented in the catch throughout the year, with its peak landings during December, January and February. The abundance of *Labeo bata* was restricted to July, September, Octo-

TABLE   II

PERCENTAGE COMPOSITION OF CATCH FOR THE YEARS 1964 - 70

Name of fish	1964	1965	1966	1967	1968	1969	1970	Average
Labeo diplostoma	42.30	78.46	80,12	72.48	77.98	55.73	32.40	62.78
Labeo bata	6.69	5,73	4.82	11.69	13.82	27.92	36.70	15.34
Barbus tor	35.72	9.76	10.83	11.03	2.85	4.53	7.23	11,71
Mystus seenghala	12.71	4,75	3.82	3,26	2.59	4.15	5,25	5.22
Miscellaneous species	2,58	1,30	0.42	1,54	2.76	7.61	18.42	4.95

TABLE   III

MONTHWISE PERCENTAGE REPRESENTATION OF THE FOUR MAIN
SPECIES OF FISHES   (AVERAGE OF 1964 - 70)

Month	Labeo diplostoma	Labeo bata	Barbus tor	Mystus seenghala	Miscellaneous species
January	91.13	2.90	3.82	1.75	0.40
February	86.38	5.03	5.52	2.32	0.75
March	61.02	4.81	25.22	6.99	1.96
April	57.42	11.49	16.80	11.54	2.76
May	33.48	20.06	21.54	17.16	7.76
June	44.47	22.94	19.35	9.01	4.23
July	39.28	33.73	16.38	6.64	3.97
August	43.92	9.02	38.29	3.85	4.90
September	29.33	30.53	29.81	5.59	4.74
October	47.78	23.74	17.24	5.79	5.45
November	75.52	9.56	8.52	4.11	2.29
December	89.70	3.62	4.67	1.54	0.47

TABLE   IV

DISTRIBUTION OF DIFFERENT SPECIES OF FISHES AT DIFFERENT
FISHING ZONES   (BASED ON DATA OF 1964)

Name of fishes	Representation at different centres %			
	Lunkhar arm		River course	Sir arm
	Upper reaches	Lower reaches		
Labeo diplostoma	46.38	43.01	41.32	18.77
Labeo bata	11.35	16.38	—	0.46
Barbus tor	22.17	23.71	51.42	66.99
Mystus seenghala	16.51	15.93	5.19	12.33
Miscellaneous spp.	3.59	0.97	2.07	1.45

ber, June and May; that of *Barbus tor* to August, September and March and that of *Mystus seenghala* to April and May.

The zonewise distribution of the four main species of fishes is presented in Table IV.

Distribution of *Labeo diplostoma* was more or less uniform in the fishing grounds of River course (41.32%) and at the upper and lower reaches of Lunkhar arm (46.38 and 43.01%, respectively). However, at the zone of Sir arm the catch of this species was less intense (18.77%). *Labeo bata* constituted 11.35 and 16.38% respectively at the fishing grounds of the upper and lower reaches of Lunkhar arm. At Sir arm its landings were negligible (0.46%) and totally absent along the River course. Higher landings of *Barbus tor* (67%) is recorded in the catch from the zone of Sir arm as well as from River course (51.42%). Of the four main species, *Mystus seenghala* was less represented, the higest landings of which (16.15%) was from the upper reaches of Lunkhar arm.

Znamensky (*op. cit.*) has mentioned that temperature of water has an important role in the horizontal distribution of fish in Gobindsagar reservoir and that Lunkhar arm is characterised by warmer waters. As seen from the pattern of distribution of *Labeo bata* it is only reasonable to assume that it prefers warmer waters, as evidenced by the greater concentration of the species in the grounds of Lunkhar arm and its total absence in River course, this being the deepest and coldest region in the reservoir.

ACKNOWLEDGEMENT

REFERENCES

Bhatnagar, G. K. 1964. *Indian J. Fish.*, II, 1A : 485.

Khan, A. A., N. A. George and O. P. Pandey. 1975. *Fish. Technol.*, I2, 1 : 64.

Znamensky, Yu. A. 1967. *FAO Report to the Government of India.*, TA 2290:9.