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# Study on Biodiversity, Feeding Habit and Growth of Fishes with Reference to Physico – Chemical Parameters in Mahanadi River of Surajgarh, District – Raigarh, C.G., India

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## ABSTRACT

The variety and variability of plants, animals and microorganisms with an ecosystem is known as Biodiversity and in the aquatic ecosystem the study of aquatic biodiversity is done, aquatic ecosystem is the biggest ecosystem of the world. Water is the major component of all types of aquatic ecosystem. The quality of the water is directly or indirectly affected to the life of aquatic organism in present study has been carried out from January 2020 to December 2020 during the period of investigation water and fish samples were collected from different sampling sites in the Mahanadi River of Surjgarh area. The river water sample were collected by the help of sampling bottle and fish samples were collected by the help of local fishermen with uses of different types of Nets and crafts. The physicochemical parameters of the river water was analyzed which showed seasonal variation. The feeding habit of river fishes were also studied by the examination of food substance found in their stomach on the basis of feeding habit collected fish have been divided in to three categories like herbivore, carnivore, and omnivore. All these three feeding type may further grouped under three sub categories via-surface feeders, sub surface and column feeders and bottom column feeders. During the entire study period, a total 26 fish species have been identified and recorded on particular water parameter. The physic-chemical data of Mahanadi River that we have received from this study suggested that the water quality of Mahanadi River is suitable for the biodiversity of fishes.

*Key words:* Physico-chemical parameter, Mahanadi river, Feeding habit

## Introduction

Biodiversity refers to the variety of animals and plants of the world. Mahanadi is river of the Ganga

drainage system. The total length of the river Mahanadi is 859 Km. in which 289 Km. flow through Chhattisgarh state. The Mahanadi river originated form Sihava mountain from Dhamtari

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district of Chhattisgarh. It is also known as The Ganga and life line of Chhattisgarh. Piscean biodiversity is directly or indirectly affected on the physico – chemical parameters of water. The aim of the present study to observe water quality, fish feeding habit and fish biodiversity in Mahanadi River. The investigation was unertaken during January 2020 to December 2020 in Mahanadi river of Surjgarh district Raigarh, C.G.

**Materials and Methods**

I Study area and sampling sites - For this study we

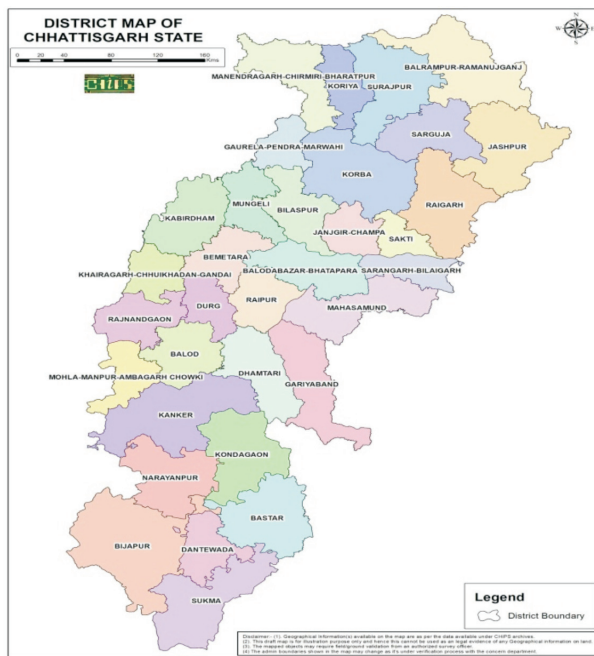


Fig. 1. Map of chhattisgarh

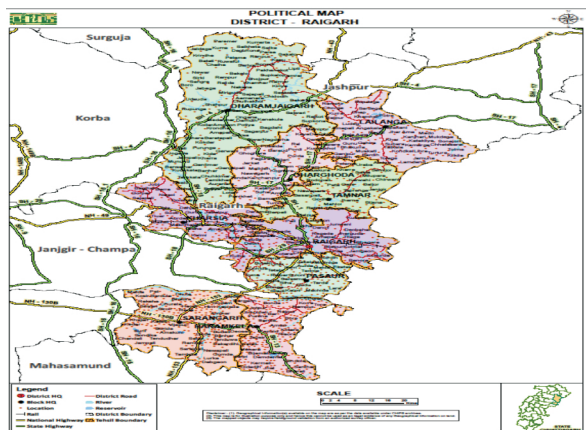


Fig. 2. Map of Raigarh

have selected the Mahanadi river of surjgarh region of Raigarh district of chhattisgarh state.

II Collection of water and fish sample - Water sample were collected from different sampling site of Mahanadi River by the help of sampling bottle and fish sample were collected by the help of various types of nets and crafts. The physico – chemical parameter of river water was also analyzed as per guide lines provide by APHA (2005).

III Photography - Photography of collected fish samples were done by the help of Nikon digital camera.

IV Identification of Fishes - The collected fish samples were identified by the help of standard literature

V Preservation of fishes - The collected fish samples were preserved in 10 percent Formaldehyde solution and stored in a plastic container for further study.

**VI Study of the Fish Population Growth**



Fig. 3. Photo of Mahanadi river



Fig. 4. Photograph of study area

**Table 1.** Fish Biodiversity and Feeding Habit in Mahanadi River of Surajgarh Distict Raigarh

S. N.	Order	Family	Genus and species name	Genara	Number of species	Feeding habit
1	Cypriniformes	Cyprinidae	<i>Laboe gonius</i>		1	Herbivorous and bottom feeder
2	Cypriniformes	Cyprinidae	<i>Laboe bata</i>		1	Herbivorous and bottom feeder
3	Cypriniformes	Cyprinidae	<i>Laboe fimbriatus</i>		1	Herbivorous and bottom feeder
4	Cypriniformes	Cyprinidae	<i>Laboe calbasu</i>		1	Herbivorous and bottom feeder
5	Cypriniformes	Cyprinidae	<i>Lebeo pangusia</i>		1	Herbivorous and bottom feeder
6	Cypriniformes	Cyprinidae	<i>Laboe boggut</i>		1	Herbivorous and bottom feeder
7	Cypriniformes	Cyprinidae	<i>Laboe rohita</i>	1	1	Herbivorous and bottom feeder
8	Cypriniformes	Cyprinidae	<i>Catla catla</i>	1	1	Omnivorous and surface column feeder
9	Cypriniformes	Cyprinidae	<i>Cirrhinus mrigala</i>	1	1	Herbivorous and bottom feeder
10	Cypriniformes	Cyprinidae	<i>Cyprinus carpio</i>	1	1	Herbivorous and bottom feeder
11	Cypriniformes	Cobitidae	<i>Lepidocephalichthys guneta</i>	1	1	Detritus and bottom feeder
12	Cypriniformes	Siluridae	<i>Ompok bimaculatus</i>	1	1	Carnivorous and bottom feeder
13	Cypriniformes	Siluridae	<i>Wallago attu</i>	1	1	Carnivorous and middle feeder
14	Cypriniformes	Bagridae	<i>Myustus seenghala</i>	1	1	Omnivorous and column feeder
15	Cypriniformes	Bagridae	<i>Myustus vittatus</i>	1	1	Carnivorous and subsurface column feeder
16	Cypriniformes	Bagridae	<i>Myustus aor</i>	1	1	Carnivorous and middle feeder
17	Cypriniformes	Bagridae	<i>Myustus bleckeri</i>	1	1	Carnivorous and bottom feeder
18	Cypriniformes	Begridae	<i>Rita rita</i>	1	1	Carnivorous and bottom feeder
19	Perciformes	Centropomidae	<i>Chanda ranga</i>	1	1	Carnivorous and surface feeder
20	Perciformes	Centropomidae	<i>Chanda nama</i>	1	1	Carnivorous and surface feeder
21	Perciformes	Gobiidae	<i>Glossogobius giuris</i>	1	1	Carnivorous and Middle feeder
22	Perciformes	Nandidae	<i>Nandus nandus</i>	1	1	Carnivorous and bottom feeder
23	Beloniformes	Belontiidae	<i>Xenotodon cancula</i>	1	1	Carnivorous and bottom feeder
24	Mastacemaliformes	Mastacembelidae	<i>Macrognathus aculeatus</i>	1	1	Carnivorous and bottom feeder
25	Mastacemaliformes	Mastacembelidae	<i>Mastacembelus armatus</i>	1	1	Carnivorous and bottom feeder
26	Cluipiformes	Notopteridae	<i>Notopetrus notopterus</i>	1	1	Carnivorous and bottom feeder

The increase in size of Population is called growth to study the fish population growth in fishes, we collected Fish and their fingerling from sampling station in monthly intervals and measured their length and weight with the help of electronic weight machines and tape the data was noted and recorded. growth is calculated following formula –

$$\frac{L_1}{T_1} - \frac{L}{T} = \frac{OR}{T_1} - \frac{W}{T}$$

Where L = total length at time

T

L = total length at time T

W<sub>1</sub> = total weight at time T

W = total weight at time T

VII pH- The River water pH was measured by the help of Digital pH Meter and pH Paper.

**VIII Study the feeding habit of fishes-** To study the feeding habit of fishes found in the Mahanadi river of Surjgarh region, we dissect the stomach of fishes and analyzed the food items found in it.

**IX Temperature-** Temperature of river water was measured with the help of a Celsius and digital thermometer.

**X Depth-** Depth of river water was measured by straight rod calibrated in meter.

**XI Water colour-** in the colour of river water was determined by visual comparison of sample with known concentration of colored solution (by using platinum – cobolt coomparator.

**XII Odor-** 100 ml of the water sample was taken in a wide necked conical flask of 150 ml. capacity and tighted with stopper, then the flask was shaken for 2 minutes, opened and smelt.

**XIII Taste -** In a glass beaker 200 ml of water sample was taken

**Table 2.** Showing the Fish Growth & weight of Mahanadi River in Surjgarh District – Raigarh C.G. India

Name of fish →		<i>Lebeo rohitha</i>		<i>Labeo bata</i>		<i>Cirrhinus mrigala</i>		<i>Labeo calbasu</i>	
Sl. N.	Months	Length (cm)	Weight (gm)	Length (cm)	Weight (gm)	Length (cm)	Weight (gm)	Length (cm)	Weight (gm)
1	January	12	65	12	60	14	88	12	82
2	February	14	88	14	80	15	190	14	126
3	March	16	109	15	106	20	280	18	274
4	April	21	198	18	190	26	400	24	450
5	May	27	341	24	250	28	600	26	500
6	June	30	427	26	400	31	700	28	540
7	July	32	551	30	350	34	850	30	632
8	August	30	650	33	600	36	900	31	750
9	September	35	784	38	800	38	1050	34	850
10	October	89	850	40	1000	40	1200	36	1000
11	November	42	980	41	1100	42	1300	38	1150
12	December	45	1000	42	1150	43	1350	40	1200
	Season				Seasonal Variation				
	Pre – monsoon	16	115	15	109	19	240	17	234
	Monsoon	30	493	29	400	32	763	29	606
	Post - monsoon	41	903	41	1014	41	1225	27	1048

and boiled and the cooled to room temperature and the taste was is determined.

**XIV Dissolve oxygen:** Dissolved oxygen of river was determined by wrinklers method and D.O. meter

**XV Total alkanity** - Total alkanity was determined by titimetric method.

## Results and Discussion

**I Water Temperature-** The river water Temperature was recorded with a mean value of 24 °C.

**II Depth** - The average Depth of river water was recorded 27 meters.

**III Colour** - The colour of the river water was reported to be clean from January to march greenish in April- May and brown form the whole rainy season.

**IV pH value** - pH value of the river water varied from 7.4 to 7.8 with the mean value 8.

**V Total alkanity** – Total alkanity was recorded in range 70 mg/l to 96.0 mg/l with the mean value of 84 mg/l.

**VI Taste** – Taste of the river water also varied from season to season, the clear water taste sweet in winter season slightly salty in summer and salty taste during the rainy.

**VII Odor** - Odor of the river water was recorded faith during winter season. Fishy during summer

and earthy in rainy season.

**VII Dissolve oxygen** – Dissolve oxygen was range between 6mg /l to 7 mg/l with the mean value of 7 mg/l.

**IX Air Temperature:** The maximum air temperature was recorded during summer season and minimum in winter.

## Conclusion

Most of the parameter analyzed in the Mahanadi river water at Surajgarh was in acceptable range. The finding from this study we could Proved that the Mahanadi river water quality of Surjgarh area is suitable for Biodiversity Feeding and growth of Fishes

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