

# **Investigation into the Gut Contents of Rohu (Labeo Rohita), a Prominent Indian Carp, Derived from Meeranpur Lake in Sultanpur District, Uttar Pradesh, India**

Priyanshi Singh, Research Scholar of Zoology, Department of Zoology, Arunodaya University, Naharlagun, Arunachal Pradesh, India.

Dr. Surya Prakash Mishra (Associate Professor), Research Guide, Department of Zoology, Arunodaya University, Naharlagun, Arunachal Pradesh, India.

## **ABSTRACT**

This study investigates the puzzling organic highlights of Meeranpur Lake in Sultanpur Region, Uttar Pradesh, India, by directing a careful examination of the gut contents of Rohu (Labeo Rohita), one of the most notable carp species in India. By careful perception and exploration, the venture means to reveal insight into Rohu's taking care of inclinations and trophic connections inside this particular marine environment. The objective of the ongoing audit was to analyze the gut contents of Indian striking carp Rohu (Labeo rohita) from Sultanpur, Uttar Pradesh, India's Meeranpur Lake. From August 2018 to July 2019, month to month tests were gathered from the lake to analyze its contents. The gastrointestinal contents of the Indian enormous carp, Lohita rohita, are inspected to give data on the amount and nature of dietary parts as well as the support of the fish proclivity. The outcomes got were utilized to ascertain the pace of food thing volume in the gut (% Vi), the recurrence of explicit food items present in guts (% Oi), the record of predominance, and the survey of food items found in the gut contents of L. rohita. At the point when conditions are typical, the L. rohita fingerling stage floats for zooplankton, involving phytoplankton as an enhancement. The fish's fingerling stage showed solid areas for an assurance of more unassuming phytoplankton and all zooplanktonic living beings. The grown-up type of L. rohita displays qualities in areas of inclination for all zooplanktonic organic entities, certifiable assurance for most of phytoplanktonic organic entities, and diminished huge scope vegetation. The current audit concurred that the Indian striking carp, L. rohita, shows unmistakable consideration strategies as it develops from fingerling to adulthood.

**Keywords:** Gut Contents, Rohu (Labeo Rohita), Prominent Indian Carp, Derived, Meeranpur Lake

## **1. INTRODUCTION**

In India, the Rohu (Labeo rohita) is as yet a notable type of freshwater carp that is esteemed for the two its organic and business worth to the fishing business. To all the more likely comprehend the dietary inclinations and natural connections of this species, an exhaustive examination concerning the contents of Rohu's stomach was directed. The audit explicitly centered around occurrences from Sultanpur District, Uttar Pradesh, India's Meeranpur Lake. Meeranpur Lake is situated in a fundamental waterfront district, and information on Rohu's dietary inclinations in this space could give significant bits of knowledge into the job of this species in the neighborhood food web, supplement cycling, and different parts of the natural framework.

Rohu assumes a significant part in both social and monetary parts of the Indian carp polyculture structure. Interest in understanding the natural participations and conduct of this species has expanded because of its noticeable quality in tank-farming and business fishing. The examination of the gut contents fills in as a vital device for unwinding Rohu's nourishing inclinations and gives comprehension of its job as a client inside the sea life natural framework.

The Sultanpur Locale of Uttar Pradesh's Meeranpur Lake arises as a significant mark of intermingling for this examination. The lake's interesting environmental elements — like its vegetation, creatures, and water quality — make it a special living space for marine life. Given Rohu's critical job in keeping up with the equilibrium of this organic framework, concentrating on its gut greenery becomes fundamental to grasping the befuddling web of organizations between the species and its ongoing circumstance.

The decision of Meeranpur Lake for this examination is urgent in view of its geological significance and the manner by which the lake's marine assets support neighbourhood

networks monetarily. The audit expects to give objective experiences and down to earth suggestions for fisheries chiefs and protection endeavours. Through explaining Rohu's food inclinations in this particular area, experts can add to the advancement of reasonable fisheries rehearses and the safeguarding of marine biodiversity.

The philosophy utilized in the examination incorporated a careful examination and assessment of Rohu examples gathered from Meeranpur Lake. Investigation of the contents of the stomach incorporates the distinguishing proof of proof and the evaluation of prey items, giving an extensive comprehension of the taking care of propensities for the species. This examination is steady with bigger scope regular examinations that mean to disentangle the complexities of food networks and parts of natural frameworks in freshwater conditions.

The investigation of the Rohu from Meeranpur Lake's stomach contents fills in as a significant task to expand how we might interpret the species' organic job and taking care of inclinations. The discoveries of this examination could have broad ramifications for fisheries no matter how you look at it, protection strategies, and the judicious utilization of marine assets comparable to Meeranpur Lake and comparable organic frameworks in India.

## 2. LITERATURE REVIEW

In their review published in the *Worldwide Diary for Parasitology: Parasites and Natural life*, Kristmundsson and Freeman (2014) explore the confusing relationship between parasites and wild life. The investigation delves into the parasitic fauna that affects natural life, providing light on the variety, prevalence, and potential consequences for have populations. The review emphasizes how important it is to comprehend parasite-have cooperations from the perspectives of the ecosystem and protection. The authors contribute to the larger field of parasitology by differentiating and dissecting several parasites, potentially shedding light on future board processes.

The research conducted by Bread Cook, Buckland, and Parcels (2014) focuses on the thorough analysis of fish stomach contents to get insights on how different fish species consume their food. Published in *Fish & Fisheries*, this paper addresses the challenges associated with accurately determining fish consumption patterns and suggests aggressive steps for content analysis. The developers increase the reliability of food arrangement data by employing comprehensive systems, providing important information to biological research and fisheries across the board. By improving the methods used to examine the intestinal contents of fish, the investigation advances our understanding of fish biology.

Chakraborty et al. (2019) advance the realm of fisheries science by their analysis of the Halda Waterway's Indian major carp issue. Published in the *International Journal of Natural Developments*, their analysis synchronizes environmental views with the economic conditions of fishermen and trappers. Through an examination of notable carp production, the paper provides tidbits of information about the conceptual environment of these economically important fish species. Additionally, the authors analyze the financial and social conditions of those involved in the fishing industry, providing a comprehensive perspective on the human instinct link point within the Halda Stream ecosystem. This intricate approach contributes to a thorough understanding of the challenges and priceless opportunities in viable fisheries for the executives.

Eiras, Zhang, and Molnar (2014) provide a comprehensive overview of the *Myxobolus* species that have been depicted between 2005 and 2013. Published in the *Orderly Parasitology journal*, the synopsis focuses on the scientific classification and description of *Myxobolus* within the phylum *Myxozoa*. Through confirming data on species representations across the specified timeframe, the authors advance our understanding of the diversity and distribution of *Myxobolus* parasites. This combination serves as a valuable resource for experts and parasitologists working with the scientific categorization of *Myxobolus*, providing a foundation for further research into the biology and toxicity of these parasites.

The focus of Ekpo, Essien-Ibok, and Nkwoji (2014) is on the dietary and maintenance habits of fish species in the Qua Iboe Stream estuary, which is located in Akwa Ibom State, southeast Nigeria, as well as their condition figures. The review, which was published in the *Global Diary of Fisheries and Hydroponics Studies*, provides tidbits of information about the

characteristics of fish populations in a certain estuarine climate. Comprehending the feeding preferences and condition factors of various fish species is crucial for the management and conservation of fisheries. The analysis broadens our understanding of fish biology in tropical estuarine biological systems.

The feeding and care habits of the peacock eel (*Macrogynathus aculeatus*) in Eastern Uttar Pradesh, India, are studied by Faridi, Rizvi, and Serajuddin (2016). Published in the Global Journal of Fisheries and Oceanic Studies, the review contributes to the body of knowledge regarding the conservation status of this particular species of fish. For the peacock eel to be protected and managed sustainably, it is essential to comprehend its food preferences and inclinations. The analysis provides important information to district executives overseeing sea-going environments as well as fisheries experts and professionals involved in the assessment.

### 3. MATERIALS AND METHODS

With the assistance of a fisher, examples of the exploratory fish *Labeo rohita* were gathered from Meeranpurlake in Sultanpur, Uttar Pradesh, India between August 2018 and July 2019. The month to month combination of 10 examples and the examination of the gut contents were intended to zero in on the irregular variety in the fish's eating routine inclination and care. Soon after the grouping, a 10% formalin arrangement was infused into the overall assortment of fish guineas pigs' stomachs to end food handling. After the stomach was opened, the contents were all inspected under a binocular magnifying instrument to decide the sythesis, heading, and relative significance of every food thing.

#### 3.1. Visual Estimation Method

How much food in the stomach and its distension were thought about while assessing the guardian's expertise through visual appraisal. As per entirety, the different gut states are depicted as follows: follow, cleanse, 1/2 full, 1/4 full, 3/4 full, gluttoned, and full.

#### 3.2. Volumetric Methods

Many experts believe that a more appealing approach to the quantitative analysis of stomach contents is food volume. The volume creates a very suitable evaluation approach, especially considering that fish are herbivorous and mud-loving. The ratio of the volume of each meal item to the total volume of the stomach contents is used to express the explicit food volume.

$$\text{Percentage by Volume}(\%V_i) = \frac{\text{Volume of individual food item}(V_i)}{\text{Total Volume of gut content}(V_t)} \times 100$$

#### 3.3. Occurrence Method

The most straightforward method for deciding the general meaning of various food items and to pass judgment on the dietary creation of a fish populace is to record the presence or nonappearance of every food thing across all people; the importance is induced from the degrees of whole guts containing every food thing. Each dinner that happens in a specific number of stomachs is noted and shared as a level of all the fish tolerates that have been analyzed.

$$\text{Percentage of Occurrence}(\%O_i) = \frac{\text{Number of Stomach containing prey}(N_i)}{\text{Total number of Stomach examined}(N_t)} \times 100$$

#### 3.4. Index of Preponderance

The strength list gives a solitary motivating force to every trademark in view of the recurrence of occurrence and amount of different food items. The pervasiveness record gives an exact and quantifiable reason for evaluating the different food fixings. An investigation of the acquired licenses allows the food items to be situated by mathematical strength. The rundown of pervasiveness is persuaded by it and enjoys tremendous benefits, especially while zeroing in on fish diet in wild conditions where creatures approach different natural materials. They likewise feel that it ought to be an objective and the perfect proportion of food strength in the eating routine. On the other hand, the rundown of strength approach is unseemly for dietary investigations since it doesn't recognize the significance of food items in view of their weight or recurrence. The accompanying condition was utilized to get the record of predominance:

$$\text{Index of preponderance(I)} = \frac{V_i \times O_i}{\sum V_i \times O_i} \times 100$$

Where, VI= Percentage of volume of food items.

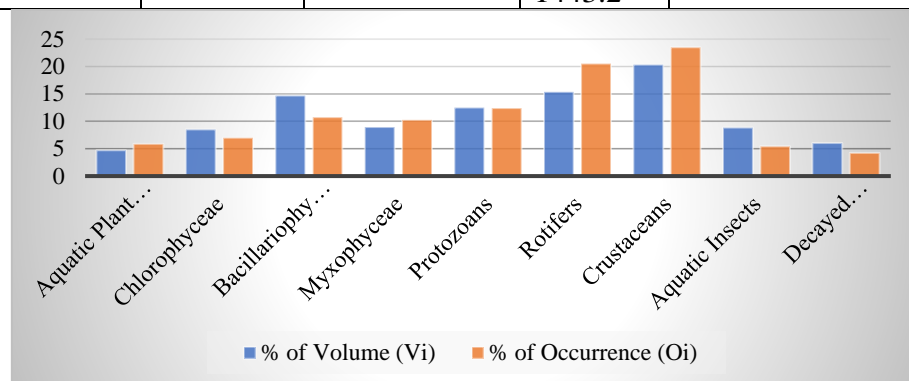
O<sub>i</sub>= Percentage of occurrence of food items.

#### 4. RESULTS AND DISCUSSION

The whole 100 stomachs of *L. rohita* were analyzed remotely in the ongoing examination. Table 1 records the Strength Document and the Assessment of Different Food Items for the Gut Contents of *L. rohita* Fingerlings. Cladocerans and copepods, which are scroungers, comprised the principal food items in the stomach contents of fingerlings, representing 23.50% by occurrence and 20.35% by volume. The second significant dietary thing in the stomach contents, containing 15.40% by volume and 20.54% by occurrence, was rotifers. The accompanying significant dietary parts of gut contents, which make up 14.70% by volume and 10.76% by occurrence, were molded by Bacillario phyceae (diatoms). In the fingerlings' stomach contents, protozoans made up 12.50% of the volume and 12.40% of the rate. In the gut contents, the level of Myxophyceae (blue green development) was 8.95% by volume and 10.25% by rate. A piece of the gut contents was outlined by how much Chlorophyceae (green development and desmids), which made up 6.99% by occurrence and 8.50% by volume. The instars of land and water proficient bugs outline 8.85% of the volume and 5.45% of the occurrence. Huge scope vegetation leftovers were taken care of by 5.90% by occurrence and 4.70% by volume.

**Table 1: The stomach contents of fingerling Indian significant carp, *Labeo rohita*, from Meeranpur Lake in Sultanpur, Uttar Pradesh, India, were evaluated and the record of prevalence was utilized.**

Food Items	% of Volume (V <sub>i</sub> )	% of Occurrence (O <sub>i</sub> )	V <sub>i</sub> × O <sub>i</sub>	Index of Preponderance (I)	Grading
Aquatic Plant Materials	4.70	5.90	40.85	4.30	VIII
Chlorophyceae	8.50	6.99	75.30	4.72	VI
Bacillariophyceae	14.70	10.76	200.75	12.80	III
Myxophyceae	8.95	10.25	80.25	5.38	V
Protozoans	12.50	12.40	122.10	7.35	IV
Rotifers	15.40	20.54	320.30	20.30	II
Crustaceans	20.35	23.50	545.35	36.90	I
Aquatic Insects	8.85	5.45	52.75	4.50	VII
Decayed Organic Matter	6.05	4.21	5.55	3.75	IX
Summation	100.00	100.00	$\sum V_i \times O_i = 1443.2$	100.00	



**Figure 1: The stomach contents of fingerling Indian significant carp, *Labeo rohita*, from Meeranpur Lake in Sultanpur, Uttar Pradesh, India, were evaluated and the record of prevalence was utilized.**

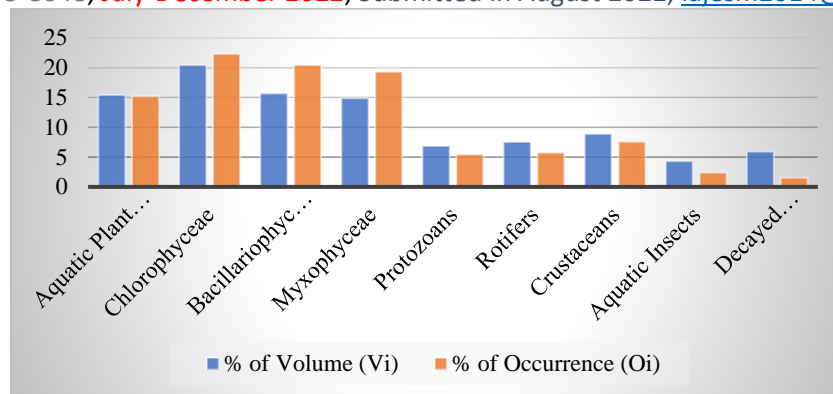


The level of regular matter that was rotted or semi-spoiled was only 6.05% by volume and 4.21% by frequency. Food items that are critical for fingerlings of exploratory fish (*L. rohita*) are recorded in the ongoing audit's Document of Predominance and Assessing of Food Items. These are organized by mathematical transcendence and incorporate Scavengers (36.90%; Grade I), Rotifers (20.30%; Grade II), Bacillariophyceae (12.80%; Grade III), Protozoans (7.35%; Grade IV), Myxophyceae (5.38%; Grade V), Chlorophyceae (4.72%; Grade VI), Land and water proficient Bugs and their hatchlings (4.50%; Grade VII), Extras of enormous scope vegetation (4.30%; Grade VIII), and Decayed and semi-spoiled regular matter (3.75%; Grade II).

Table 2 contains the Document of Pervasiveness and Inspecting of different dietary items of gastrointestinal contents of grown-up period of exploratory fish *L. rohita*. Chlorophyceae, or green development, shaped the really dietary items of stomach contents outlining 20.45% by volume and 22.30% by occurrence, should a grown-up *L. rohita* fish happen. The second significant food thing that impacted the stomach contents was Bacillario phyceae (diatoms), which represented 15.70% of the volume and 20.45% of the rate. The following important food items of gut contents were shaped by Myxophyceae (blue green growth), accounting for 14.90% of volume and 19.30% of occurrence. The residual parts of large-scale vegetations also provide important food sources for the gut contents, accounting for 15.40% of volume and 15.20% of occurrence. Compared to fingerlings, the amount of Scavengers in the stomach contents of adult *L. rohita* fish was lowest, accounting for 8.90% of volume and 7.60% of occurrence. Rotifers accounted for 7.55% of the intestinal contents by volume and 5.75% by incidence. Protozoans made up 5.45% of the contents of the gut by incidence and 6.85% of the volume. The percentage of natural matter that was decayed or semi-rotted was 1.55% by occurrence and 5.95% by volume. The proportion of amphibian bugs and their offspring, measured in volume and frequency, is 4.30% and 2.40%, respectively.

**Table 2: The stomach contents of a grown-up stage Indian huge carp, *Labeo rohita*, from Meeranpur Lake in Sultanpur, Uttar Pradesh, India, were evaluated and the file of prevalence was utilized.**

Food Items	% of Volume (Vi)	% of Occurrence (Oi)	$V_i \times O_i$	Index of Preponderance (I)	Grading
Aquatic Plant Materials	15.40	15.20	260.16	18.05	IV
Chlorophyceae	20.45	22.30	390.45	24.42	I
Bacillariophyceae	15.70	20.45	310.05	20.40	II
Myxophyceae	14.90	19.30	275.42	19.40	III
Protozoans	6.85	5.45	23.85	2.80	VII
Rotifers	7.55	5.75	55.40	4.89	VI
Crustaceans	8.90	7.60	87.82	6.90	V
Aquatic Insects	4.30	2.40	20.99	1.44	IX
Decayed Organic Matter	5.95	1.55	19.06	1.70	VIII
Summation	100.00	100.00	$\sum V_i \times O_i = 1443.2$	100.00	-



**Figure 2: The stomach contents of a grown-up stage Indian huge carp, *Labeo rohita*, from Meeranpur Lake in Sultanpur, Uttar Pradesh, India, were evaluated and the file of prevalence was utilized.**

The present study's Record of Predominance and Assessing of Food Items records the accompanying food items in mathematical request of significance for the full grown period of exploratory fish, *L. rohita*: Chlorophyceae (24.42%; Grade I), Bacillariophyceae (20.40%; Grade II), Myxophyceae (19.40%; Grade III), Land and water proficient Plant Materials (18.05%; Grade IV), Scavengers (6.90%; Grade V), Rotifers (4.89%; Grade VI), Protozoans (2.80%; Grade VII), Decayed Regular Matter (1.70%; Grade VIII), and Maritime bugs and their hatchlings (1.44%; Grade IX).

## 5. CONCLUSION

The examination of the gut contents of Rohu (*Labeo Rohita*) at Meeranpur Lake, Sultanpur Area, Uttar Pradesh, gives significant bits of knowledge into the ecological parts of this notable Indian carp inside its remarkable marine territory. The study has successfully identified important components of the Rohu's diet, ranging from aquatic spineless animals to establish matter and other fish species, through meticulous examination of stomach contents. These findings contribute to a more complex understanding of the trophic relationships of the species and shed light on its preferred habitat in Meeranpur Lake. According to the current review, we assume that the water section feeder, Indian important carp rohu (*L. rohita*), feeds on small fish and the remnants of decreased vegetation. The rohu's adolescent and adult stages are herbivorous, with a tendency toward lower vegetation and green growth. When conditions are normal, rohu fingerlings go toward zooplankton, using phytoplankton as a secondary food source. The rohu fingerlings demonstrated areas of strength for a determination for all zooplanktonic organisms as well as more modest phytoplanktons in this way. The mature stage of rohu has favourable characteristics for most phytoplanktonic organic entities, reduced macrovegetation, and a preference for all zooplanktonic organisms. Overall, it is agreed upon that rohu exhibits distinct caring behaviours as it grows from fingerlings to adults.

## REFERENCES

1. Å. Kristmundsson, M.A. Freeman / International Journal for Parasitology: Parasites and Wildlife 3 (2014) 135–146 145
2. Baker, R., Buckland, A., & Sheaves, M. (2014). Fish gut content analysis: robust measures of diet composition. *Fish and Fisheries*, 15(1), 170-177.
3. Chakraborty B.K., Shahroz M.H., Bhuiyan A.B., Bhattacharjee S. and Chatteraj S. (2019). Status of Indian major carps spawns in the Halda River along with marketing and economic condition of the Fishers and related collectors. *International Journal of Biological Innovations*. 1 (2):40-50. <https://doi.org/10.46505/IJBI.2019.1202>
4. Eiras JC, Zhang J, Molnar, K (2014). Synopsis of the species of *Myxobolus* Buetschli, 1882 (Myxozoa: Myxosporidia: Myxobolidae) described between 2005- 2013. *Syst. Parasitol.* 88: 11-36.
5. Ekpo, I. E., Essien-Ibok, M. A., & Nkwoji, J. N. (2014). Food and feeding habits and condition factor of fish species in Qua Iboe River estuary, Akwa Ibom State, southeastern Nigeria. *International Journal of Fisheries and Aquaculture. Studies*, 2(2), 38-46.

6. Faridi, A. A., Rizvi, M. M. A., & Serajuddin, M. (2016). Food and feeding habits of peacock eel, *Macrognathus aculeatus* (Bloch, 1786) from Eastern Uttar Pradesh, India. *International journal of fisheries and aquatic studies*, 4(4), 130-134.
7. Ganeshwade, R. M. (2015). Studies on seasonal changes in the Biochemical profile of fresh water fishes from Tasgaon Region Dist. Sangli. UGC Minor Project, 1- 62.
8. Hemananda T, Mohial N, Bandyopadhyay PK, Mitra AK, Gu'rello G (2013). *Myxobolus leafa* sp. nov. (Myxozoa: Bivalvulida) from the gill filament of *Labeo bata* (Hamilton) from Manipur, India. *TurkiyeParazitol. Derg.* 37, 40-43.
9. Langde, P. P. (2021). Comparative Study of Proximate Composition and Nutritional Values of Indigenous and Exotic Carps in Different Seasons from Gharni.
10. Manko, P. (2016). Stomach content analysis in freshwater fish feeding ecology. University of Prešov, 1-116.
11. Mishra, S. P. (2020). Analysis of the gut contents of Indian major carp rohu (*Labeo rohita*) from Meeranpur Lake of district Sultanpur, Uttar Pradesh, India. *International Journal of Zoology and Applied Biosciences*, 5(4), 217-221.
12. Mishra, S. P. (2021). Seasonal Variation in The Proximate Composition of Indian Major Carp *Labeo Rohita* of District Sultanpur, Uttar Pradesh, India. *International Journal of Zoology and Applied Biosciences*, 6(1), 10-14.
13. Nansimole, A., Sruthi, S., Devi, T., Lekshmi, S., Balasubramaniam, N., & Radhakrishnan, T. (2014). Studies on morphometry, feeding biology and sex ratio of *Saurida undosquamis* (Fam: Synodontidae) from Neendakara area, Kollam, South West coast of India. *Indian Journal of Scientific Research*, 5(2), 51-58.
14. Prakash, M. S., & Dikshit Archana, M. A. K. (2021). Proximate composition of Indian major carp *Catla catla* at different seasons in Bakhira Lake of District Sant Kabir Nagar, Uttar Pradesh, India. *International Journal for Modern Trends in Science and Technology*, 7(0706195), 278-284.
15. Sharma, S., Kaur, N., & Singh, N. D. (2022). Seasonal Prevalence of Intestinal Parasites as Bioindicators of Aquatic Ecosystem and their Impact on Histology and Biochemical Parameters of *Labeo rohita* in Ludhiana District of Punjab. *Journal of Soil Salinity and Water Quality*, 14(2), 244-250.

