

GUT CONTENT ANALYSIS OF FRESH WATER FISH *CYPRINUS CARPIO* (COMMON CARP)

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Abstract:

The present study is an attempt to investigate the food items of *cyprinus carpio* which is a major economic as well as food fish in the present study area. The *cyprinus carpio* tolerate wide range of environmental stress because of this culture of this fish easy and rapid growth also has and plus point. The present study is carried out for four months in which 50 fish samples were collected and their gut content was examined to check the food and feeding of the fish. The study reveals mixed type of food items consumed by the fish. The stomach content of *cyprinus carpio* is majorly composed of plant origin matter, detritus and zooplanktons and some semi digested matter were also seen during this study. The feeding intensity and the food conversion were the future topics in the study of *cyprinus carpio*. This clearly indicates that this fish is an omnivorous and can shift on detritus.

Keywords: *Cyprinus carpio*, freshwater fish, gut content, zooplankton

Introduction:

The feeding behavior of fish was studied by various researchers and noted key observations to enhance the aquaculture production. Fish is an eminent source of food for mankind. In recent years the world population and their demand of food is increasing, and creating big issue for the society. To tackle this problem the supplementary sources of food except agricultural crops were gained importance, the fresh water fish is a good source of nutritious and complete diet for mankind. Fish also has a medicinal value, considering this importance of fish the research on the different aspect of fresh water fishes were getting importance in recent years. 41.24% of all known species of fishes are fresh water fishes. Fishes forms the most important protein rich and less fat component of human diet. It contains lysine and sulphur containing amino acids which complement cereal based diets. Most fish contain 15 to 25 % protein and 1 to 5 % fat. Fish is a good source of vitamin A, B and D. The feeding behaviour of fish was studied by various researchers and noted key observations to enhance the aquaculture production.

A thorough knowledge on the food and food and feeding habit of fishes by the gut content analysis provides an idea about the abundance of plankton and other food material in the local rivers and reservoirs. The present work is carried out to study the feeding habits of *cyprinus carpio* (common carp) by analysing the gut content of fish. Therefore, the

study of food and feeding habits of *cyprinus carpio* (common carp) is very important.

Shukla and Patel (2013) studied food and Feeding Behaviour of *Cyprinus carpio* and their Gastroscopic Index from Govindgarh Lake., and concluded that the *cyprinus carpio* is omnivorous fish. Food habits of common carp (*Cyprinus carpio*) in Main Outfall Drain ,Al-Nassiriya, Iraq were studied by **Afrah and Awady(2013)** and found that, the *C. carpio*, was omnivorous. **Mandol et al., (2013)** studied the diet and feeding habits of *Cyprinus carpio* in relation with water quality of integrated rice fish farming ecosystem. **Farag et al., (2013)** carried out research on some gross morphological studies on the internal anatomy of the scaled common carp fish (*Cyprinus carpio*) in Egypt. **Wakil et al., (2014)** examined the stomach contents of two fish species (*Clarias gariepinus* and *Oreochromis niloticus*) in Lake Alau, North – Eastern Nigeria. Food and feeding habits of the common carp (*Cyprinus carpio*) (in Lake Koka, Ethiopia, *Momona* were studied by **Dadebo et al., (2015)**. **Vajargah and Hedayati (2015)** studied Morphological variations of common carp (*Cyprinus carpio*). Growth performance of common carp (*Cyprinus carpio*) fingerlings feed with various protein levels were examined by **Cristian, et al., (2015)**. **Nasir and Hamed (2016)** studied the growth development of young common carp *Cyprinus carpio* through dietary sodium chloride supplementation. Morphometric

characters of *Cyprinus carpio* collected from Dal Lake, Kashmir, India., were reported by Siraj *et al.*, (2017).

Materials and methods:

Collection of fish samples

The fishes for the present study were collected from local fish markets such as

Washim fish market and Malegaon fish market. Fishes were also collected different water resources such as Supkhela dam, Ekburji dam, Tornala dam, Sonkhas dam in Washim region of Maharashtra.



Photoplate I: Sampling sites around Washim region

Identification of fish samples

The fish sample from different resources were collected and brought to laboratory for further investigation. The fish specimens were identified to species level using the available identification key of Talwar and Jhingran (1991). The length and weight of the fish were recorded together with photography of fish.

Gut content analysis

For the present study 50 samples of experimental fish were collected, dissected and gutted at the site of collection. Furthermore the gut removed from fish was preserved in 10% formalin to prevent any further digestion and decomposition of the contents. Afterwards, the gut was dissected and its contents were preserved with 5% formalin. The preserved gut contents were then examined under the microscope and contents were then enumerated and identified to the lowest taxa possible.

For the qualitative study of the food of each species, its gut content was carefully examined under low and high power of the microscope. In order to find out the percentage composition of food, Numerical method Hynes (1950) was followed where the number of individuals of each food item were recorded and expressed as percentage of the total number of organisms found in all the fish examined.

Results and discussion:

For the present investigation the total 50 samples of freshwater fish *Cyprinus carpio* were studied and analyzed to determine the food and feeding habit of fish.

The gut content was classified in to four categories such as animal origin matter, plant origin matter, detritus and some unidentified matter. About 53 percent of fish gut samples were found to be fully filled which indicates that the *cyprinus* actively feeds. The fullness of

gut was classified in to three catagories in which semifilled, full and empty stomach. No such monthly variation is seen in case of animal origin matter. The animal origin matter is majorly consisting of zooplankton, Undigested Lorica of Zooplanktons, insect body parts and semi digested larvae. **Mandol et al., (2013)** they were also found zooplankton in the gut content of *cyprinus carpio*.

It was also observed that fish can digest the internal matter of Zooplanktons and outer Calcareous shell was undigested. During the study period approximate mean percentage value of animal origin matter was found to be 27.75%. The animal origin matter was observed 30% in the month of October. In November it was of 25%. In December in 26% and in January it was about 30 %. The plant origin matter is majorly consisting of Algae, Diatoms and Aquatic plant. The approximate mean percentage value of plant origin matter was found to be 31.75%, the highest amount of plant matter were also reported by **Manon and Hossain (2011)**. The highest percentage of plant origin matter was found in the month December and the lowest values were recorded in the month of October. Nearly constant values of detritus were reported during the

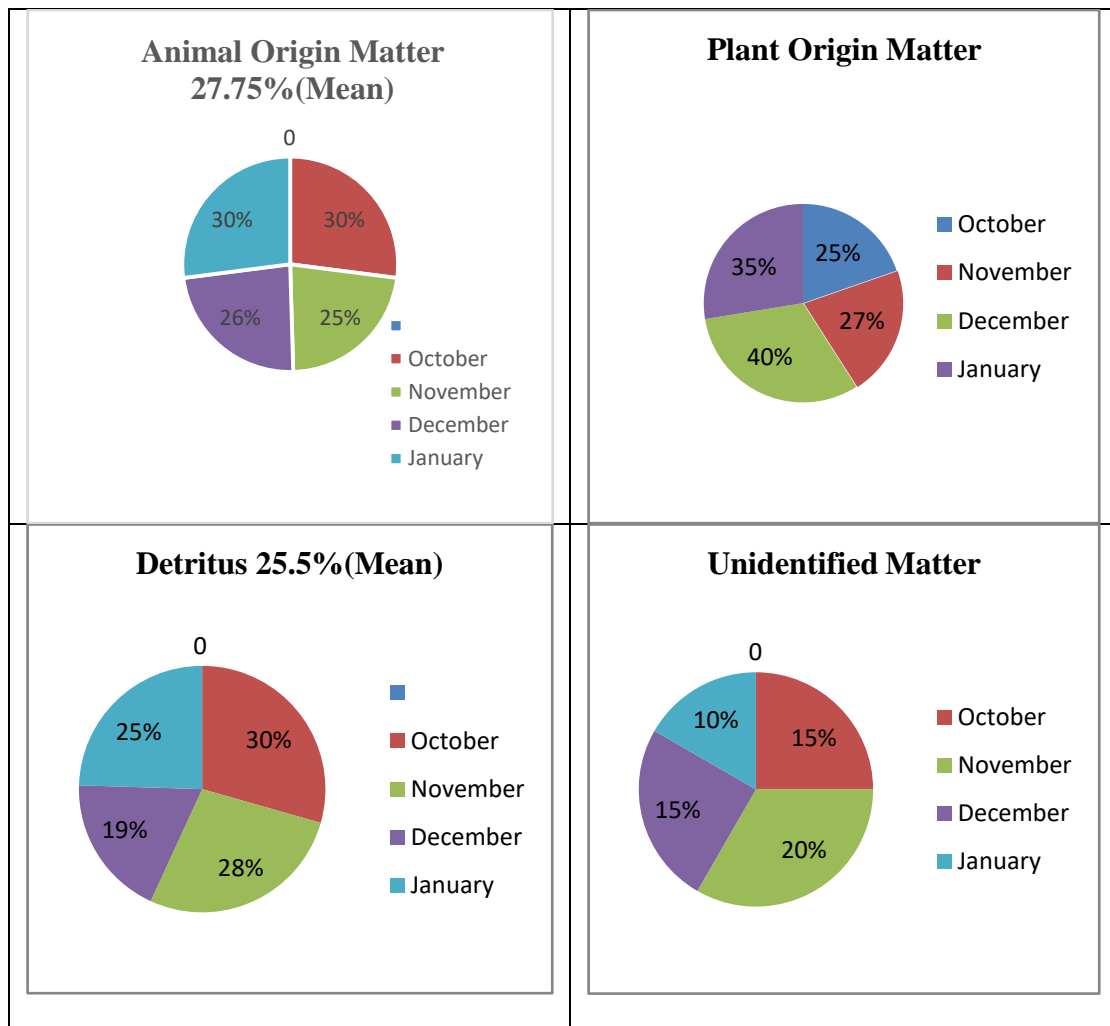
present study. The average value of detritus was found to be 25.5 % it suggests that the *Cyprinus carpio* is consistently feeds on the detritus, the highest reporting of detritus feeding of *Cyprinus carpio* which was 45.25%, were reported by **Shafi et al., (2012)**. Detritus, insects and macrophytes were the dominant food categories occurring in the gut content of *cyprinus carpio* were also reported by **Dadebo et al., (2015)**, the Zooplanktonic (*Cladocera, Copepoda, Ostracoda, Rotifera*), benthic (*Diptera, Gastropoda*) and phytoplanktonic (*Euglenophyta, Cyanophyta, Pyrrophyta, Chlorophyta*) organisms, plant residues and detritus in the digestive tract of the fish *cyprinus* were also observed by **Gul et al. in (2010)**.The mixed type diet confirms that the fish is been omnivores in feeding habit this type of results supported by the same findings of **Shukla and Patel (2013)**.Near about 15 percent matter was unidentified; it may have digestive juices and sticky material. On the basis of these kind of finding it can concluded that *cyprinus carpio* is to be fit for polycultuer type of fishery practice which means, the *cyprinus carpio* can gives an extra benefit to fish farmers because it does not compete for food with indian major carp.

Month	Plant Origin Matter 31.75%(Mean)	Animal Origin Matter 27.75%(Mean)	Detritus 25.5%(Mean)	Unidentified Matter 15%(Mean)
October	25%	30%	30%	15%
November	27%	25%	28%	20%
December	40%	26%	19%	15%
January	35%	30%	25%	10%

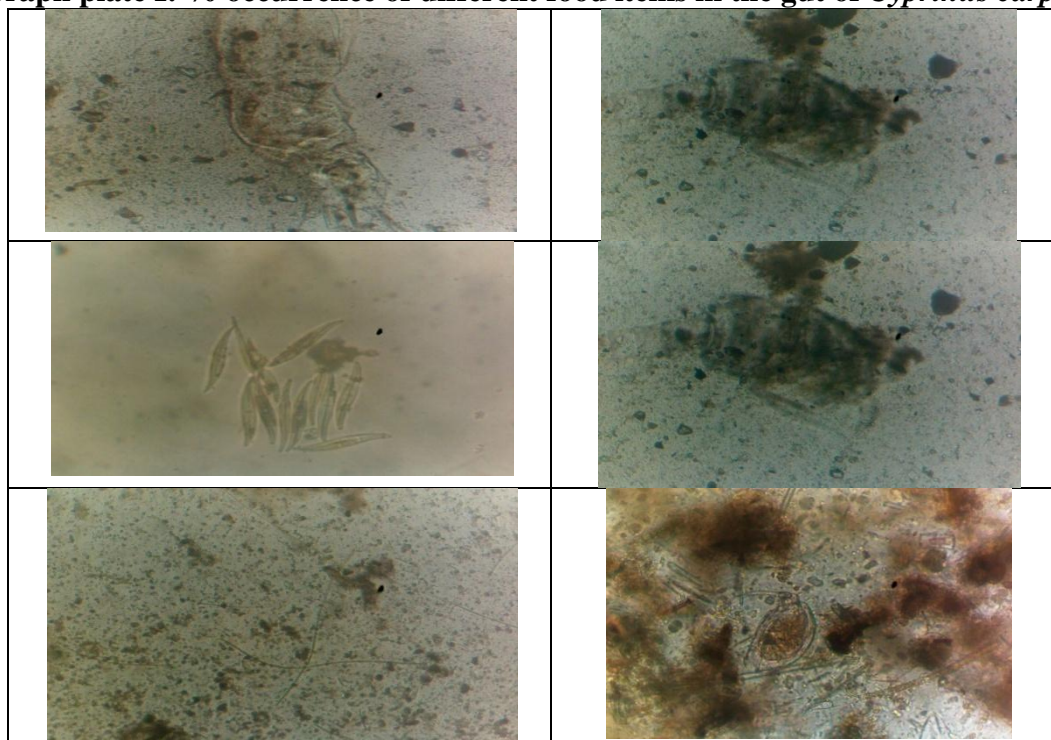
Table I: Percentage occurrence of different food items in the gut of *Cyprinus carpio*.

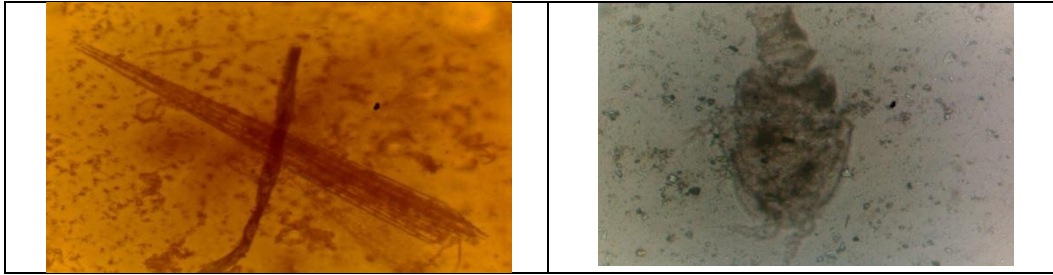
Month	No. of fish examined	Full filled gut	Semi filled gut	Empty gut
October	15	53.34%	20%	26.66%
November	13	46.15%	23%	30.70%
December	12	58.33%	16.66%	25%
January	10	60%	20%	20%

Table II: Gut content of *Cyprinus carpio*.



Graph plate I: % occurrence of different food items in the gut of *Cyprinus carpio*.





Photoplate II: Gut content of fish *Cyprinus carpio*

References:

1. **Afrah A., and M. A. Awady (2013):** Food habitat of common carp (*cyprinus carpio* l. 1758) in main outfall Drain , Al Nassiriya, Iraq, Thi-qar university. 3(4): 9-17.
2. **Cristian O., Coroian C.O., Vioara M.V., Daniel I., Cocan D.I., Razvan D., Vațu R.D., Răducu C. M. and A. Coroian (2015):** Growth performance of common carp (*Cyprinu scarpio* L.) fingerlings fed with various protein levels. AACL bioflux .8 (6): 1-15.
3. **Dadebo E., Eyayu A., Sorsa S. and G. Tilahun (2015):** Food and Feeding Habits of the Common Carp (*Cyprinus carpio* L. 1758) (Pisces: Cyprinidae) in Lake Koka, Ethiopia, *Momona Ethiopian Journal of Science (MEJS)*. 7 (1): 16-31.
4. **Farag M. M., Wally Y. R., Daghsh S. M. and A. M. Ibrahim (2013):** Some gross morphological studies on the internal anatomy of the scaled common carp fish (*Cyprinus carpio*) in Egypt, Faculty of Veterinary Medicine, Cairo Univer-sity. 7(1): 15 – 29.
5. **Gul A., Yilmaz M., Kuşçu A. And S. Benzer (2010):** Feeding Properties Of Common Carp (*Cyprinus carpio* L.1758) Living In Hirfanli Dam Lak *Kastamonu Education Journal*. 18 (2): 545 – 556.
6. **Mandol M. R., Rahman M., Nahar D. A., Ahamed F. M., Sarker A.A., Subba R. B. and Y. Hossain (2013):** Diet and Feeding Habits of *Cyprinus carpio* in Relation with Water Quality of Integrated Rice Fish Farming Ecosystem. *Yeamin Hossain Our Nature*.11 (2): 138-151.
7. **Manon M. R. And M. D. Hassian (2011):** Food and feeding habit of *Cyprinus carpio* var, Niamotpur degree colleg, Naogaon. 9 (2): 13-18.
8. **Nasir N.A. and Q. Hamed (2016):** Growth development of young common carp *Cyprinus carpio* through dietary sodium chloride supplementation, *Mesop. Environ.* 2 (2): 12-18.
9. **Shafi S., Bhat F. A., Yousuf A. R. and M. Parveen (2012):** Biology of *Cyprinus carpio* comun is from Dal Lake, Kashmir with reference to food and feeding habits, length-weight, and fecundity Dal of Kashmir, Srinagar, J & K, India. 11(1): 79-87.
10. **Shukla S. N. and V. Patel (2013):** Food and Feeding Behaviour of *Cyprinus Carpio* and their Gastrosomatic Index from Govindgarh Lake, Rewa (M.P.) India. Online international interdisciplinary journal. 3: 2249-9598.
11. **Siraj S., Masarat S., Bashir M., Gudoo M. Y. and M. F. Mir (2017):** Morphometric characters of *Cyprinus carpio* collected from Dal Lake, Kashmir, India. *International journal of fauna and biological studies*. 4 (4): 08-11.
12. **Vajargah M. F. And A. Hedayati (2015):** Morphological variations of common carp (*Cyprinus carpio*) by fixation and preservation in 10% formalin. *Journal of coastal life medicine*. 3 (7): 518-519.
13. **Wakil U. B., Haruna A. B., Mohammed G. A., Ndirmbita W. L., Yachilla B. M. and M. U. Kumai (2014):** Examinations of the stomach contents of two fish species (*Clarias gariepinus* and *Oreo chromisniloticus*) in Lake Alau, North – Eastern Nigeria, *Agriculture, Forestry and Fisheries*. 3(5): 405-410.