International Journal of Fisheries and Aquatic Research
www.fishjournals.com
ISSN: 2456-7248
Received: 10-08-2022, Accepted: 26-08-2022, Published: 12-09-2022
Volume 7, Issue 2, 2022, Page No. 49-51

Food and feeding habits of *Labeo rohita* (Hamilton, 1822) from water bodies of Beed district, Maharashtra

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Abstract
In the present study, an attempt has been made to investigate the food and feeding habits of fingerlings of Indian major carp, *Labeo rohita* from different water bodies of Beed district in Maharashtra. Crustaceans formed the main item of gut contents forming 30.3%. Rotifers were next in the order of dominance forming 24.7% in the gut contents of *Labeo rohita*. Aquatic insects, bacillariophyceae, myxoyphyceae, chlorophyceae, unidentified matter and aquatic plant materials formed 12.5% 9.4% 7.9% 6.7% 5.8% and 2.7% respectively.

Keywords: *Labeo rohita*, food-feeding, gut content analysis

Introduction
Food is the most important and vital factor for the growth and survival of fish. The food and feeding habits of different fishes vary from season to season even with a day [1]. Proper knowledge of food and feeding habits of fish is an important prerequisite for increasing fish production. Food also plays an important role in the migration and spawning behaviour of the fish. As the nature of food depends upon the nature of several biotic and abiotic factors, the problem is interesting from specific, as well as ecological point of view [2]. Different fishes consume different types of food items. So the present work was undertaken to determine the food and feeding habits of *Labeo rohita* from different water bodies which might be helpful to the fish farm manager for the increase of fish production. No such type of work has been done in this region.
Labeo rohita commonly known as 'rohu' is an important fish farmed in composite fish farming. This graceful Indo-Gangetic riverine species is the natural inhabitant of the riverine system of Northern and Central India, and the rivers of adjacent countries like Pakistan, Bangladesh, and Myanmar. In India, it has been transplanted into almost all riverine systems. This species has also been introduced in many countries Japan, China, Sri Lanka, Nepal and Malaysia. The compatibility of rohu with other carps like *Catla catla* and *Cirrhinus mrigala* made this species an ideal candidate in composite culture carps.

Methodology
For the present study, a total of 50 live fingerlings of *Labeo rohita* were collected from June 2021 to May 2022. The samples were collected from water bodies with help of local fishermen once in every month. Just after collection 10% formalin solution was injected into the guts of all fishes. The specimens were finally preserved in 10% formalin. Individual food items were separated in petridishes. The food items were identified under microscope. Gravimetric method [3] was followed for the estimation of the percentage composition of different food items.

Results and Discussion
Different food items and their percentage composition found in the gut of fingerlings of *Labeo rohita* are depicted in Table 1. Crustaceans formed the main item of good contents forming 30.3%. The major genera of crustaceans in the diet were *Ceriodaphnia cornuta,Indialona ganapati,Cyclops viridis,Mesocyclos leukarti,Cypris obensa* and *Cylocypris globosa*. Rotifers were next in the order of dominance forming 24.7% in the gut contents of *Labeo rohita*. This group was mainly represented by *Brachionus* spp, *Filina longiseta, Keratella tropica* and *Lecane bulla*. Aquatic insects formed 12.5% and were represented by Gryllus and mosquito larvae. Bacillariophyceae formed 9.4% of the gut contents. This group was represented by *Melosira* sp, *Navicula mutica, Nitzschia* sp and *Fragilaria* sp. Myxophyceae formed 7.9% of the gut contents of *Labeo rohita*. Among the myxophyceae the abundant genera were *Microcystis areuginosa, Nostoc* spp, *Anabaena* spp and *Oscillatoria chlorine.*Chlorophyceae formed 6.7% of the gut contents and was represented by *Eudorina sp, Volvox sp, Ulothrix zonata,Pediastrum duplex, Spirogyra margariata, Oedogonium sp,* and *Chlorella vulgaris*. Unidentified matter and aquatic plant materials formed 5.8 and 2.7% respectively (Table 1 & Figure 1).

Selectivity of food by *Labeo rohita* was studied by Khan and Siddiqui (4). They observed *Labeo rohita* as selective feeder, in case of fingerlings there was a strong selection for zooplanktonic organisms and smaller algae. The present work corroborate with above findings of [4].
Food of fry and fingerling is generally different from the adult. Young ones with small intestine prefer zooplankton, and are able to digest rotifers, cladocerans and other microscopic animals easily. The phytoplankton and algae are not easily digested [5].

Table 1: Food items of *Labeo rohita* from waterbodies of Beed district, Maharashtra

Sr. No.	Food items	Percentage composition
1	Crustaceans	30.3%
2	Rotifers	24.7%
3	Aquatic insects	12.5%
4	Bacillariophyceae	9.4%
5	Myxophyceae	7.9%
6	Chlorophyceae	6.7%
7	Unidentified matter	5.8%
8	Aquatic plant materials	2.7%
	SUMMATION	100%

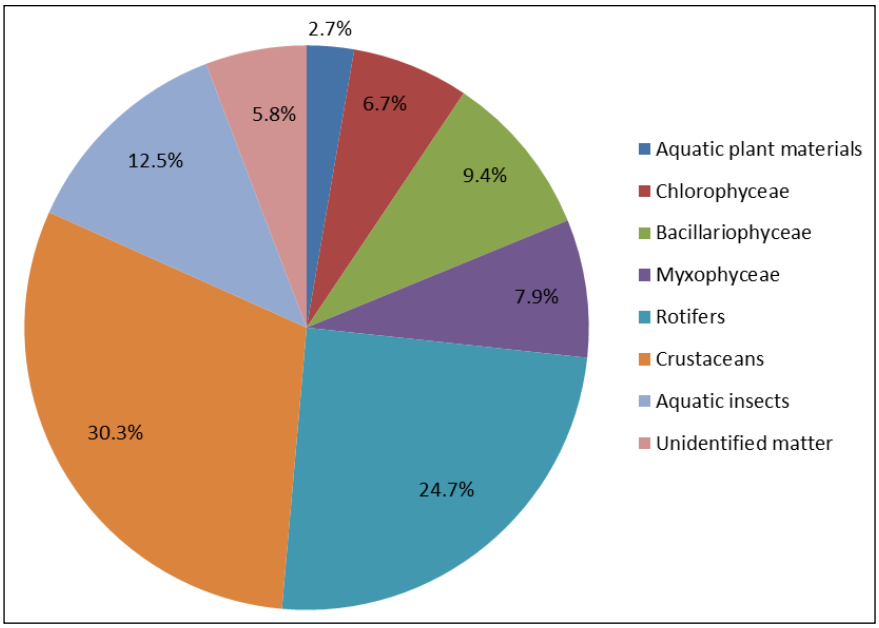

Fig 1: % of food items in gut of *Labeo rohita* from waterbodies of Beed district (Maharashtra)

Studies on the food and feeding of different Indian freshwater fishes have been made by different workers. Mishra [6] studied gut contents of *Labeo rohita* from Meeranpur lake of Sultanpur district (Uttar Pradesh) and reported strong positive selection all fingerling stage for all zooplanktonic organisms, while the adults of *Labeo rohita* showed strong negative selection for all zooplanktonic organisms and positive selection for phytolanktonic organisms and concluded that *Labeo rohita* exhibits different feeding strategy during its growth from fingerling to adult. Under natural condition fingerings of *Labeo rohita* prefers zooplankton with phytoplankton as a subsidiary food [7]. Sakhare and Chalak [8] studied food and feeding of *Catla catla* from water bodies around Ambajogai city (Maharashtra) and reported rotifers as the main item of gut content. On similar lines Arthi *et al*., [9] studied food and feeding habits of *Ompak bimaculatus* and *Ompak malabaricus* of River Amaravathy (Tamil Nadu) and found both species omnivorous feeding mainly on vegetable matter and fish. Saikia *et al.*, [10] reported food and feeding habit of *Channa punctatus* from the paddy fields of Sivasagar district (Assam) and categorized fish as carnivorous.
The food and feeding habits of *Heteropneustes fossilis* from the Brahmaputra river system in Assam was studied by [11] and found fry as planktophagous. Juveniles feed on crustacean, plant matter, miscellaneous matter and insects. Adults feed on insects, detritus and plant matter. Serajuddin *et al.*, [12] conducted the study of food and feeding habits of *Mastacembelus armatus* and pointed out that this fish as carnivorous and highly predacious. Jesu *et al.*, [13] studied the food and feeding habits of *Mystus montanus* from river Tambaraparani and categorized the fish as an omnivorous bottom feeder. Padmakumar *et al.*, [14] studied the food and feeding behaviour of *Horabagrus brchysoma* and reported this fish as omnivorous. Choudhuri [15] described the food and feeding strategy of *Puntius conchonius* and concluded that availability of certain food items made the fish euryphagous and availability of limited food items made it stenophagous. Anna Mercy *et al*., [16] reported *Puntius melanampyx*

as omnivorous bottom feeder. On similar lines food and feeding habits of an exotic fish, *Cyprinus carpio* from water bodies of Ambajogai was studied by [17].

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