

# Food and Feeding Habit of Palla, *Tenualosa ilisha* (Hamilton) from Ring Dam (Up-Stream) River Indus

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**Abstract.-** A total of 236 palla, *Tenualosa ilisha* size ranged from 138 to 328 mm were collected from ring dam (up-stream) river Indus near Kotri Barrage during October to December 2003. Qualitative and quantitative study of gizzard content showed that the specimen of *Tenualosa ilisha* avoided zooplankton and strongly selected some genera of phytoplankton such as Bacillariophyta (*Gyrosigma*, *Cyclotella*, *Cymbella*, *Melosira* and *Navicula* species), Cyanophyta (*Oscillatoria*, *Lyngbya*, *Chroococcus*, *Merismopedia*, *Microcystis* and *Aphanocapsa*) and Chlorophyta (*Odogonium*, *Rhizoclonium* and *Scenedesmus*). It was also noted that the feeding activity increased with the increase in size.

**Key words:** Feeding habit, *Tenualosa ilisha*, mouth gape and total length relationship.

## INTRODUCTION

The food and feeding habits of fish vary with the time of the day, season, size of fish, various ecological factors and different food substances present in the water body (Hynes, 1950). *Tenualosa ilisha*, popularly known as "Palla" is regarded as one of the most delicious fish. In Pakistan, this species ascends River Indus from the Arabian Sea (Narejo *et al.*, 1998). Various workers like Pillay and Rao (1962), Halder (1968) and Ramakrishnaiah (1972) from India have reported food and feeding habits of *T. ilisha*. One report (Jafri *et al.*, 1999) is available from Pakistan and there is no information regarding the occurrence of *T. ilisha* in confined waters. Present communication gives detailed information on food of palla recently found in ring dam (up-stream) River Indus near Kotri Barrage. Ring dam (area 4.5 Km<sup>2</sup>) was constructed along the side of Indus River for the breeding of common carps. The results of the present study would be useful for future development of culture techniques of this species in ponds.

## MATERIALS AND METHODS

The material for the present investigation was obtained from commercial catch of the fishermen through gill netting from ring dam (up-stream) near

Kotri Barrage, from October to December, 2003. A total of 236 specimen of *Tenualosa ilisha*, size range 138 to 328 mm, were analysed. The collected fish were brought to the laboratory and preserved in 10% buffer formalin. Total length and mouth gape was measured. Total length was taken from the tip of the snout to the tip of the lower lobe of the caudal fin. The mouth gape-total length relationship was expressed by least-square methods (LeCren, 1951). The arithmetic relationship between total length of fish and mouth gape is as follows:  $TL = a + b MG$  ( $r=$ ), where TL is total length, MG is mouth gape, a, Intercept, b, Regression co-efficient and r is correlation of co-efficient.

The fish were dissected and the guts were placed on paper. The stomach (gizzard) of each fish was then separated out and weighed individually. Afterwards these were dissected to study the stomach contents in a Petri dish. Finally the contents were examined under the light microscope by using Sedgwick-Rafters plankton counting chamber and the results were expressed in percentage (Hynes, 1950; Pillay, 1952).

## RESULTS AND DISCUSSION

The diet of *T. ilisha* of ring dam (up-streams) river Indus was mainly composed of three groups of phytoplankton (93.0%), plant material (3.04%) and debris (3.96%) (Table I). Among the phytoplankton Bacillariophyta (*Gyrosigma*, *Cyclotella* and *Cymbella*) 70.4%, Cyanophyta (*Oscillatoria*,

**Table I.-** Showing the average monthly percentage of various groups of food items found in the stomach of *Tenualosa ilisha* from ring dam (up-stream) River Indus.

Food items	October	November	December	Mean
Bacillarisphyta	66.5	70.2	74.6	70.4
Cyanophyta	17.2	16.7	15.9	16.6
Chlorophyta	9.4	10.5	7.1	9.04
Organic debris	6.9	2.6	2.4	3.96

**Table II.-** Occurrence of different genera of phytoplankton in the gut contents of *Tenualosa ilisha* from ring dam (up-stream) River Indus.

Food items	October	November	December
<i>Cyclotella</i>	Common	Common	Abundant
<i>Melosira</i>	Rare	Common	Abundant
<i>Cymbella</i>	Abundant	Abundant	Abundant
<i>Gyrosigma</i>	Abundant	Abundant	Abundant
<i>Navicula</i>	Common	Abundant	Abundant
<i>Synedra</i>	Common	Abundant	Abundant
<i>Stauroneis</i>	Rare	Rare	Common
<i>Oscillatoria</i>	Abundant	Common	Common
<i>Lyngbya</i>	Nil	Nil	Rare
<i>Merismopedia</i>	Rare	Rare	Nil
<i>Microcystis</i>	Nil	Rare	Nil
<i>Aphanocapsa</i>	Rare	Rare	Nil
<i>Chroococcus</i>	Rare	Nil	Nil
<i>Oedogonium</i>	Common	Rare	Rare
<i>Rhizoclonium</i>	Rare	Common	Nil
<i>Scenedesmus</i>	Nil	Rare	Rare

*Lyngbya*, *Microcystis* and *Chroococcus*) 16.6%, Chlorophyta (*Oedogonium*, *Rhizoclonium* and *Scenedesmus*) 9.04% and debris 3.96% (Table II). Similar observations have been reported by various workers. Pillay and Rao (1962) studied gut contents of *H. ilisha*, size range 43 to 200 mm, from River Godavri which consisted of phytoplankton such as *Spirogyra*, *Oscillatoria*, *Microcystis* and *Merismopedia*. Halder (1968) described the food of *H. ilisha* in the size range 120 to 160 mm and from 180 to 200 mm from Hooghly estuarine system consisting of *Cyclotella*, *Melosira*, *Gyrosigma*, *Microcystis*, *Aphanocapsa*, *Oscillatoria* and *Spirogyra*. Ramakrishnaiah (1972) studied the food and feeding habit of *H. ilisha* in the size range 50 to 150 mm from Chilka lake, consisting of organic detritus (48.56%), copepods (25.82%), algae (10.32%), molluscan larvae (7.85%), mysids (5.34%) and diatoms (2.10%). This finding differs

from the present findings. Islam (1974) analysed gut content of *H. ilisha* from Bangladesh and found highest quantity of phytoplankton. Jafri *et al.* (1999) studied food and feeding habit of land-locked populations of *T. ilisha* from Keenjhar lake. The feeding adaptation of *T. ilisha* and the structure of digestive tract also suggest the planktivorous habit of palla (Jafri, 1987; Halder, 1968; Bapat and Bal, 1958). Many researchers (Jafri *et al.*, 1999; Ramakrishnaiah, 1972; Halder, 1968; Qureshi, 1968) reported some genera of zooplankton in the guts of *T. ilisha* from different water bodies. In the present investigations it was noted that *T. ilisha* avoided zooplankton and fed upon some selected genera of phytoplankton. This preference might be due to the different environmental conditions where two populations were living. The results of the relationship between total length and mouth gape of *T. ilisha* were found to be linear in arithmetic and

logarithmic form as  $\text{Log Mg} = -0.09 + 0.99 \times \text{Log total length}$  ( $r = 0.98$ ). A linear relationship was obtained between total length and mouth gape in the present study (Fig. 1). Similar linear relationship was recorded by Dabroski and Bardega (1984) in the case of silver carp, grass carp and bighead carp,

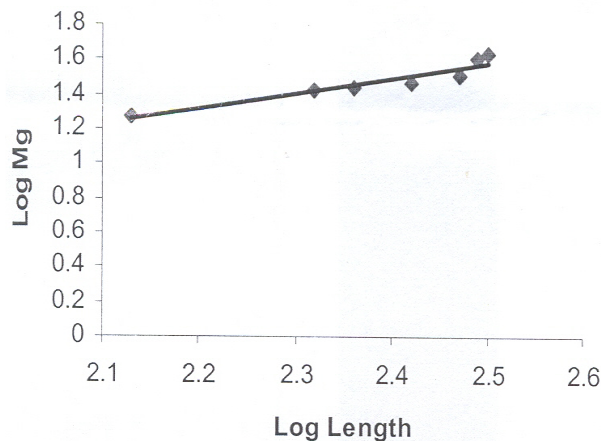


Fig. 1. Logarithmic relationship between total length and mouth gape of *Tenualosa ilisha* from ring dam (up-stream) River Indus near Kotri barrage.

by Osmani and Kohinnor (1994) in *Ompok pabda* and *Mystus golio* and by Rahmatullah *et al.* (2001) in *Labeo rohita*, *Catla catla* and *Hypophthalmichthys molitrix*. The regression co-efficient ( $b = 0.99$ ) was nearer to one and the correlation co-efficient ( $r = 0.98$ ) between total length and mouth gape were stronger. This means that the growth of the fish was isometric, the mouth gape increased with the increase of total length. This increase can result into change of food habit in adult fish.

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