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Length-weight relationship (LWRs) of Chambai dam fishes district Karak, KP, Pakistan

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Abstract
A study was carried out on Chambai dam fishes locally named Rohu, Silver carp and Catla (*Labeorohita*, *Hypophthalmichthys molitrix*, *Catla catla)*. During the month of May 2016 to September 2016. 50 Fishes per species sample were collected from Chambai dam district Karak, Khyber Pakhtunkhwa. Length weight relationship shows a wide variation in results for *Labeorohita*, *Hypophthalmichthys molitrix*, *Catla catla* average length 30.48cm, 17.78cm, 10.16cm and the average weight were 160g, 26g and 15g respectively. The weight-length relationship of *Labeorohita*, *Hypophthalmichthys molitrix*, *Catla catla* could be considered as very useful in fisheries research, fish biology and ecology.

Keywords: *Labeorohita*, *Hypophthalmichthys molitrix*, *Catla catla*. Length-weight relationship (LWRs), Chambai Dam

1. Introduction
The *Labeo rohita*, *Hypophthalmichthys molitrix*, *Catla catla* locally named Rohu, Silver carp, and Catla respectively, are the most important fishes mainly available in rivers, streams, dams, floodplains, ditches, canals and all the fresh water areas in Pakistan, Afghanistan, India, Nepal and Bangladesh [1-3]. All of these three fish species *Labeorohita*, *Hypophthalmichthys molitrix* and *Catla catla* are the most important fishes among the Cyprinidae family due to their good taste, high market value and as well as their much availability in Khyber Pakhtunkhwa, Pakistan. These fishes are herbivorous and hydrophilic and they completely depend upon phytoplankton, herbs, small bushes and grasses inside water and as well as algae. The length-weight relationship (LWR) is the conversion of weight into length and length into weight and vice-versa. In certain cases it is easier to measure the weight instead of length, just like in case of cephalopods [4], and then the length data can be easily converted into length with the help of (LWR).Length and weight relationship data are really important for the diagnosis of fish stock, especially to conclude coral reef fish biomass from visual census data. Length and weight and total length-standard length (TL/SL) relationship was calculated to take that type of data in a form or format which is suitable for inclusion in Fish Base [5]. The length-weight relationship is a particular approach or struggle which is widely applied in fisheries management and it is providing information about stock condition [6]. The length-weight relationship is mainly used by fishery researchers for these two major purposes; to predict the weight of a fish from its length and to compare the average associated parameters between fish groups. Length-Weight relationships which are measure necessary in the ichthyo biology and assessment the fish's average weight with the specialized or particular length category using the Mathematical relation. Growth of fish, usually signed through increase in length and weight as the most suitable feature to find out the population analysis in a specific time [7-10]. It may assist to known the body growth of fishes is either isometric or allometric in a given particular water [11]. The relationship of length-weight has theoretical and practical value in fishery management studies and eases the conversion of one measurement into another to help the rate of growth of the fish courage [12-15]. The present was conducted on the Length-Weight Relationship (LWRs) of Chambai Dam fishes District Karak, KP, Pakistan no such type of study conducted before in the length-weight relationship of Chambai dam.

2. Materials and Methods

During the month of May 2016 to September 2016 a total of 150 fishes were collected in which consists of all these three species, i.e. *Labeorohita*, *Hypophthalmichthys molitrix* and *Catla catla* have 50 fishes each bimonthly during the period from May 2016 to September 2016. After collection these samples were preserved in 5% formalin. And these samples were carried into Laboratory, where these samples were washed with tap water and then dried by blotting paper and measured from the tip of the snout up to the end of the caudal fin in cm. And then these samples were weighted by using the digital balance.

3. Results

Average weight and length of Chambai dam fishes i.e *Labeorohita*, *Hypophthalmichthys molitrix* and *Catla catla* as shown in Table 1. According to the Table.1.Chambai dam fish commonly known as Rohu (*Labeorohita*) have the total weight about 160 g and the average length was 30.48cm. While, the average weight of Silver carp (*Hypophthalmichthys molitrix)* was estimated 26 g and the mean length measured according to the Table 1 was 17.78cm. And the 3rdone Chambai dam fish commonly named Catla or china fish (*Catla catla)* has the weight about 15 g and the length which was measured by the standard scale was estimated about 10.16cm. After the measurement of total weight and length these particular fishes were divided in parts and measured their head, abdomen and tail weight and length relationship which are shown in detail in table 2. The Chambai dam fish *Labeorohita* have the head weight about 62 g and length was measured about 8.128cm. While, the abdomen, weight was 91 g and length of abdomen were 16.51cm and the tail weight was given in table 2 was 2 g and the tail length as estimated was 5.842cm. The Silver carp (*Hypophthalmichthys molitrix)* has a head about 4.572cm lengthwise and has a 15 g head, and the abdomen length was 10.922cm and has a weight about 10 g, and the tail length and weight mention in table 2 were 2.794cm and 0.7 g respectively. And the Chambai dam 3rd fish commonly named as *Catla* and scientifically named as *Catla catla* head, abdomen and tail weight and weight relationship is also estimated and measured mention in table 2. *Catla catla* head was 2.54cm lengthwise and about 5.1 g by weight and the abdomen, weight measured as 7.8 and its length was 5.588cm. While, the *Catla catla* having a tail of 2.032cm in Length and 2 g by weight.

Table 1: Weight and Length Relationship to Head, Tail, and Abdomen of these three selected species

S. no	Common name	Scientific name	Total Length	Total Weight
1	Rohu	*Labeorohita*	30.48cm	160 g
2	Silver carp	*Hypophthalmichthys molitrix*	17.78cm	26 g
3	Catla	*Catla catla*	10.16cm	15 g

Table 2: Average weight and length of Chambai dam fishes

S.no	Common name	Scientific name	Head Length	Head weight	Abdomen Length	Abdomen weight	Tail length	Tail Weight
1	Rohu	*Labeorohita*	8.128cm	62 g	16.51cm	91 g	8.128cm	2 g
2	Silver carp	*Hypophthalmichthys molitrix*	4.572cm	15 g	10.93cm	10 g	2.79cm	0.7 g
3	Catla	*Catla catla*	2.54cm	5.1 g	5.34cm	7.8 g	2.032cm	2 g

4. Discussions

The present survey was conducted from May 2016 to September 2016. And in this survey three Species were found in Chambai dam and these species were commonly known as Rohu, Silver carp and Catla (*Labeorohita*, *Hypophthalmichthys molitrix* and *Catla catla)* respectively. All these species *Labeorohita, Hypophthalmichthys molitrix, Catla catla* belongs to family Cyprinidae. The weight and Length relationship was previously studied by Afsarullah *et al* [16] in Baran dam of district Bannu, Khyber Pakhtunkhwa (KPK), Pakistan. Where they studied the Length-weight relationship of Singara fish (*Sperata seenghala)* Length weight relationship shows a wide variation in results. Faiz Ur Rehman *et al* [17] studied the morphometric characters and meristic count of Silver carp (*Hypophthalmichthys molitrix*) was conducted in Tanda Dam Kohat Pakistan during the month of January and February 2015.Meristic count (Six characters) and morphometric character (nineteen) for each specimen were studied. 20samples of silver carp were examined for the study of morphometric and meristic count. Some deviations, with regard to a few morphometric and meristic counts have been observed. The meristic counts of pectoral fin rays were constant in all three groups, while other parameters of meristic count variation in all the groups. Dorsal fin rays in a small group of silver carp were recorded 8, in medium and in large group observed 7 and the number of spines measured in a small group was one spine while in medium and large having two spines. Ventral fin rays of small group have 8 rays while in medium and large having 7 with two spines. Anal fin rays of small and medium groups having 12 rays and large groups have 13 rays with one spine. Caudal fin ray of the small group were ranging from 21-22, medium group were observed from 20-24 and in larger group were ranging from 24-25 without any spines. The morphometric character showed a gradual increase in the body length and weight increases. On the basis of meristic and morphometric characteristics, fish are identified as *Hypophthalmichthys molitrix*. Morphometric studies of *Hypophthalmichthys molitrix* in relation to body length showed that there was an isometric growth pattern. Farzana Yousaf *et al* [18] collected specimens from Karachi fish harbor. Results showed highest mean length of fish of 76.33+ 17.043cm in autumn season. The highest and mean weights of fish of 382.09+ 119.250gm were recorded in autumn. Length and weight of fish were taken in fresh condition separately for male and female. The correlation coefficient of samples showed very high degree of Correlations varying from 0.91, 0.929, 0.927, and 0.924 for spring, autumn, winter and Summer respectively. The comparison of the sample of spring, autumn, winter and summer did not show any significant difference. The length – weight relationship of *T. lepturus* were detected W=0.0043L0.36471. The mean of values of condition (K) of *T. lepturusus* were determined as 0.099. In males, low relative condition values were observed in autumn, whereas high relative condition values were observed during winter. The present studied compared with the previous study and concluded that will be useful for taxonomist, fisheries biologist and manager for its sustainable management through correct identification.

5. Conclusion

The study of weight-length relationship Rohu, Silver carp and Catla (*Labeorohita*, *Hypophthalmichthys molitrix* and *Catla catla)* respective species of this study of length can be considered as a much beneficial tool in the fisheries research. Because the present survey was conducted in the summer session, but according to the local fisherman all these three species have much rapid in growth in the winter session and also they attain heavy weight and a high Length, the reason of that seasonal growth will be studied in physiochemical later on. Hence, it is conducted due to the studying the ichthyofauna of that particular Chambai dam district Karak, KPK, Pakistan.

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