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Length- weight study of fishes from Zhob River, Balochistan, Pakistan

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Abstract: The Experimental fish samples were collected monthly during January to December 2011 from various fishermen of the Zhob river Balochistan A total number of 403 (342 *Schizothorax progastus*, 55 *Caratus auratus* 60 *Tor tor*, 50 *Glypothorax sp*) These fishes ranged from 9.42-20.2cm, 9.35-20.7cm, 7.5-16.1, 13.9-21.8cm in TL respectively. The regression coefficient of length- weight relationship and condition factor of *C. auratus, S. progastus, T. tor, Glypothorax sp*) were Log W = -0.12+2.67Log L (*C. auratus*) Log W =-0.01+2.25 Log L (*S. progastus*) Log W = -0.07+2.17 Log L (*T. tor*) Log W = -0.66+2.65 Log L (*Glypothorax sp*). The length weight relationship values indicated that growth of *C. auratus S. progastus, T. tor* and *Glypothorax* from Zhob river Balochistan was found to be positive allometry and regression coefficient (b=2.17, 2.25, 2.65, 2,65) indicated as satisfactory growth of four species (*C. auratus S. progastus, T. tor* and *Glypothorax sp*) from Zhob river Balochistan. The values of relative condition factor (Kn) was calculated for combined sexes for all the fish species found to be mean Kn = 1.0, 1.01, 0.97 and 1.31respectively.

Keywords: Zhob River, Length- weigth relationship, Condition factor and Balochistan

1. INTRODUCTION

Zhob River is about 410 kilometers in length and originates from a waterfall of Pahseen Valley known as Kan Metarzai range (Tsari Mehtarazai Pass). The weight- length analyses in fisheries science is useful in population analysis, and possess great significance in biological studies to convert weight into length and relative condition vice versa. Many scientist works on length- weight but no work is done on fishes of Zhob River so it help to future researcher to knowledge on length and weight of fishes of Zhob river.

2. MATERIALS AND METHODS

The fish samples were collected from the commercial catch of various fishermen of Zhob River, Balochistan. A total number of 403 (342 *Schizothorax progastus*, 55 *Caratus auratus* 60 *Tor tor*, 50 *Glypothorax sp*). These fishes ranged from 9.42-20.2cm, 9.35-20.7cm, 7.5-16.1cm, 13.9-21.8cm in TL respectively were procured during January to December 2011. The length of fishes were measured to the nearest mm on fish measuring board and weighed on electronic balance respectively. The estimation of length-weight parameters was determined by using LeCren (1951) formulae.

Condition factor

Condition factor (Kn) was determined for different species of different length groups. It was calculated for each 5cm interval and calculated by using LeCren (1951) modified formulae.

3. RESULTS

The data on experimental fish samples procured from Zhob River, Baluchistan is shown in **Table 1.** The regression coefficient of length- weight relationship and condition factor of *Schizothorax progastus*, *Caratus auratus tor tor* and *Glypothorax sp.* respectively, when calculated gave following equations

Log W = -0.12+2.67 LogL (*C. auratus*)

Log W = -0.01+2.50 LogL (*S. progastus*)

Log W = -0.07 +2.17 LogL (*T. tor*)

Log W = -0.66+2.65 LogL (*Glypothorax sp*.)

Above mentioned values are shown in **(Figs. 1, 2, 3, 4, 5, 6, 7 and 8)** as empirical and log-log relationships for all the fish species respectively.

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Table 1. Data on Length- weight of Fishes of Zhob River from Balochistan, Pakistan.

Length groups	*C. auratus*		*S. progastus*		*Tor tor*		*Glypothorax*	
	Mean length (cm)	Mean weight (g)	Mean length (cm)	Mean weight (g)	Mean length (cm)	Mean weight (g)	Mean length (cm)	Mean weight (g)
5.1-10.0	9.35 ± 1.5	55.5 ± 1.5	9.4 ± 1.6	16.7 ± 1.3	-	-	7.5 ± 1.5	8.4 ± 2.4
10.1-15.0	12.4 ± 1.6	61.0 ± 1.0	13.0 ± 1.0	23.3 ± 1.7	13.9 ± 1.1	29.6 ± 1.4	11.9 ±1.1	14.8 ± 2.2
15.1-20.0	16.6 ±1.4	78.5 ± 2.5	16.3 ±1.7	38.0 ± 1.0	17.1 ±1.9	41.2 ± 1.8	16.1 ± 1.1	18.2 ± 1.8
20.1-25.0	20.7 ± 1.3	121.7 ± 1.3	20.2 ± 1.8	62.2 ± 1.8	21.8 ± 1.2	88.7 ± 1.3	-	-

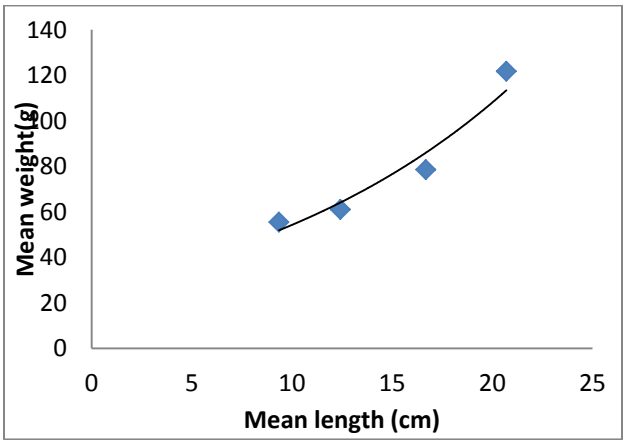

Fig. 1. Showing length- weight relationship of *Caratus auratus* from Zhob river, Balochistan (Empirical values)

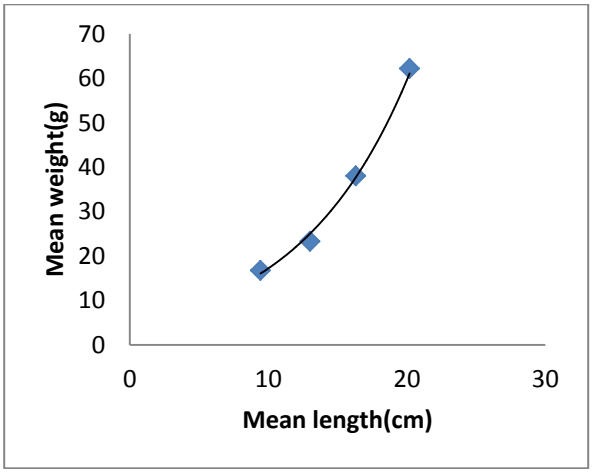

Fig. 3 Showing length- weight relationship of *S. progastus* from Zhob river, Balochistan (Empirical values)

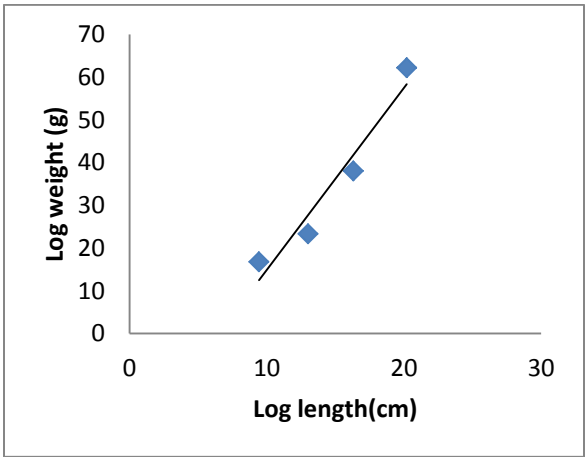

Fig. 2 Showing Log- log relationship of length and weight of *Caratus auratus* from Zhob River, Balochistan

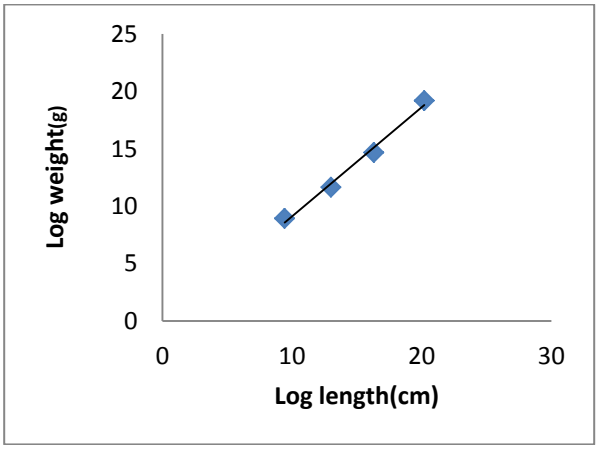

Fig. 4 Showing Log- log relationship of length and weight of *S. progastus* from Zhob River, Balochistan

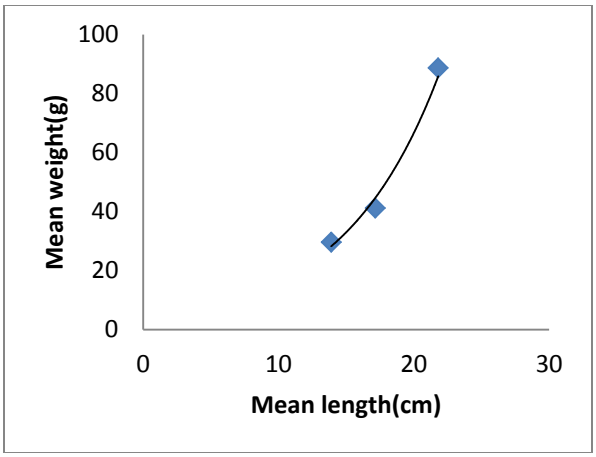

Fig. 5 Showing length- weight relationship of *Tor tor* from Zhob river, Balochistan (Empirical values)

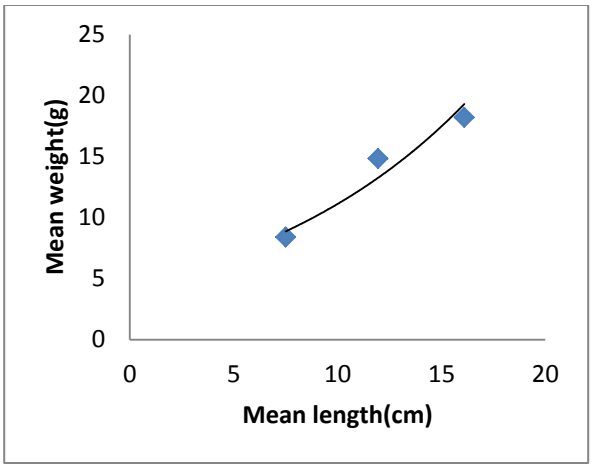

Fig.7. Showing Log- log relationship of length and weight of *Glypothorax Sp.* from Zhob River, Balochistan

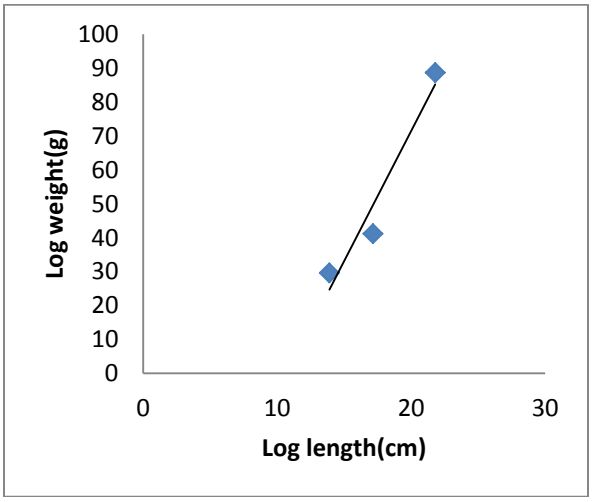

Fig.6. Showing Log- log relationship of length and weight of *Tor tor* from Zhob River, Balochistan

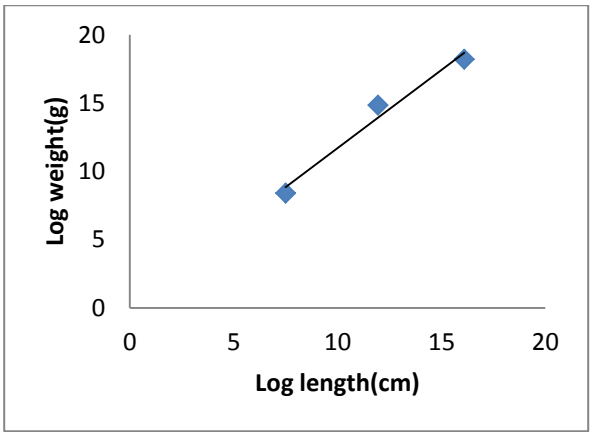

Fig. 8. Showing Log- log relationship of length and weight of *Glypothorax Sp.* from Zhob River, Balochistan

Table 2. Data on condition factor of fishes in Zhob River from Balochistan, Pakistan.

Length groups	*C. auratus*			*S. progastus*			*T. tor*			*Glypothorax sp.*		
	Obs. Wt.	Cal. Wt.	Kn	Obs. Wt.	Cal. Wt	Kn	Obs. Wt.	Cal. Wt.	Kn	Obs. Wt.	Cal. Wt.	Kn
5.1-10.0	1.50	1.48	1.01	1.18	1.21	0.97				0.85	0.52	1.10
10.1-15.0	1.74	1.71	1.01	1.28	1.36	0.94	1.47	1.60	0.91	1.17	1.17	1.0
15.1-20.0	1.85	1.88	0.98	1.56	1.49	1.04	1.61	1.49	1.02	1.20	1.28	0.98
20.1-25.0	2.08	2.06	1.0	1.79	1.61	1.11	1.94	1.38	0.99			
Mean Kn			1.0			1.01			0.97			1.08

The length–weight relationship values indicated that growth of all species from Zhob river, Balochistan was found to be positive allometry and regression co-efficient (b= 2.27, 2.25, 2.65 and 2.65) indicated as satisfactory growth of all fish species from Zhob river, Balochistan.

Factor Analysis

The values of relative condition factor (Kn) was calculated for combined sexes for all the fish species mean Kn = 1.0, 1.01, 0.97 and 1.31 in case of *C. auratus* and *S. progastus*, *T. tor* and *Glypothorax sp.* respectively shown in **(Table 2).** The condition factor

values indicated that *Glypothorax sp*. found to be in better condition than rest of fish species found in Zhob river, Balochistan.

4. DISCUSSIONS

The values of length- weight regression co-efficient b obtained for combined sexes from Zhob river, Balochistan (b= 2.27, 2.25, 2.65 and 2.65) in the present study. The t- test was conducted to see whether b values were different from the cube for both sexes at 95 % confident limit. The values were significantly different from the cube for all fish species. Various workers have calculated values of regressions co-efficient (b) in different fish species and found the value of b≤ 3, Narejo , *et al.* (1999) from Pakistan and Al-Baz and Grove (1995) from Kuwait have calculated value of regressions co-efficient in *Tenualosa ilisha* (3.0246 for males and 3.0335 for females) and (2.98 for males and 3.16 for females) respectively. Azadi and Naser (1996) showed the results of 3.16 for males and 3.20 for females in *Labeo bata* and Quddus (1993) reported values of regressions co-efficient b=3.40 in *Gudusia chapra* from Bangladesh. Hile (1936) and Martin (1949) observed that the value of regressions co-efficients (b) usually where between 2.5 and 4.0 in cisco, *Leuchthys artedi* Tesch (1968) reported that values of b might be in between 2.0 and 4.0. However a variation in b value may occur due to species variations difference in environmental factors and sex variations.

Shafi and Quddus (1974) and Quddus *et al* (1984) reported the regressions co-efficient of *Hilsa ilisha* in the range of 2.6-2.80 for females. Narejo *et al*., (2000) reported the values of 2.96 (for males) and 2.62 (for females) *Gudusia chapra*. These values are significantly different from, and similar to those obtained for *Schizothorax progastus*, *Caratus auratus* Tor *tor* and *Glypothorax sp.* in the present study, and also with in the ranges as reported by Hile (1993) and Martin (1949). The values of Kn show fluctuations in all size groups in different fish species. The highest Kn values were found in *Schizothorax progastus* and *Glypothorax sp.* in agreement with Shafi and Quddus (1974) for *Catla catla* and *Cirrhinus mrigala*. The present investigation on length- weight relationship and relative condition factor of fishes of Zhob River, Balochistan indicated that the growth rate is quite satisfactory in this river.

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