Sindh Univ. Res. Jour. (Sci. Ser.) Vol. 48 (4) 733-736 (2016)

SINDH UNIVERSITY RESEARCH JOURNAL (SCIENCE SERIES)

Fish Potential from Karez Sarawan, Panjgoor Balochistan

F. HASHIM*, N. T. NAREJO++, P. KHAN, S. JALBANI, G. DASTAGIR**, P. K. LASHARI

Department of Freshwater Biology and Fisheries, University of Sindh, Jamshoro

Received 5th April 2016 and Revised 13th September 2016

Abstract: Present study was undertaken to investigate fish potential from Karez Sarawan, Balochistan. In total 2694 specimen of different fish species were collected ranged between 5.5 to 13.08cm and 0.9- 22.06g respectively. It was observed that the fish potential of Karez Sarawan consists of 3 families, 4 genera and 7 species namely *Cyprinion watsoni, Channa striata, Labeo buggut, Labeo bata, Schizothorax sp: Aphanius ginaonis, Aphanius dispar*. Among the species *Cyprinion watsoni* was considered as the most abundant and constitutes about (70.68%) followed by *Schizothorax sp* and *Labeo buggut* (11%) of the total catch. The length-weight relationship values of the above fish were calculated and observed from the equation that *Labeo bata* found to be in ideal condition, *C. striata*, *C. watsoni* and *Labeo buggut* found in satisfactory growth respectively and poor growth was noticed in case of *Schizothorax sp*. from Karez Sarawan. The Simpson's biodiversity index (1-D = 0.481) shows that the Karez has low ichthyic diversity. It is an intense need to monitor water quality parameters regularly and stock fish in the Karez to improve and enhance the diversity. Finally it was concluded that the environment of Karez Sarawan favors the potential of economically important carp *L. bata*.

Keywords: fish potential, length weight, *Cyprinion watsoni*, *Labeo bata*, Karez Sarawan, Balochistan

1. INTRODUCTION

Fish plays an important role in human nutrition, particularly to the peoples of under developed areas to ensure access to the nutritionally adequate food for the improvement in the quality of diet of a poor person in the society. Fish is the only source which can serve much purpose for nutrient. Fish has the potential to ensure a quality food, providing 16 % of the animal protein consumed by man. The available estimate suggests that about billion people, worldwide, rely on fish as their primary source of animal protein. Fish are medically as well as economically nutritious. There are numerous fish species that are especially rich in the oils known as omega-3 fatty acids. Sanaullah and Ahmed (2014) Fish fauna plays a prime role in the aquatic ecosystem. It also affects aquatic status and composition. Fish fauna provide basis for the sustainable management of the aquatic systems (Prusty, *et al* 2007). Fauna refers to the variety of specimen depending on context and scale. Pakistan is one of the potential country having variety of fish specimen out of which Freshwater fish specimen are useful to examine factors influencing the structure of fish community (Galactos, *et al* 2004). Distribution of fish species among habitat closely related with various factors such as availability of food, breeding grounds water currents depth and physicochemical parameters (Harris, 1995). To know the fish potential of any water body, the assessment of length weight relation is essential parameter for healthy practices. Purpose of present study is to explore fish potential of Kareez Sarawan from Panjgoor, Balochistan…. Therefore increase in length and weight of fish show positive and negative allometric type (Kulbicki *et al.,* 1990).

2. MATERIALS AND METHODS

Fish samples were collected randomly from Kareez Sarawan on monthly basis during March 2014 –January 2015 by use of gill net collected samples of fish preserved in ice and was brought to the laboratory of Freshwater Biology and Fisheries, these were identified up to specie level by using different keys and by the use of website. *www.fishbase.org/*.After identification samples were preserved in 10% formalin for long term preservation. For purpose of health assessment length-weight study was undertaken. For the length - weight study fish samples were preserved in 10% formalin brought to the laboratory department of Freshwater Biology and Fisheries, University of Sindh. Fishes were analyzed in terms of weight and length then preserved in formalin solution with an individual sample tag. 2689 specimens of different fish species were collected and analyze at different length groups ranged between 5.5 to 13.08cm and 0.9- 22.06g respectively. The regression coefficient (slope of regression line of weight to length) was calculated using LeCren (1951) equation, $W = {}^{a}L^{b}$ or Log a + b Log L. a = intercept, values of a and b were calculated from Rounsefell, Everharts (1953) and

++Corresponding author: dr_ntnarejo46@yahoo.com
*Government Girls College, Panjgoor, Balochistan
** Department of Zoology, University of Balochistan, Quetta

Cushings (1968) methods. Simpson's Biodiversity Index was also applied to know the index of diversity from the collected fish species

3. RESULTS

Fish potential

Study was taken into account to investigate fish potential from Karez Sarawan, 2689 samples were collected found that these belongs to 3 families 4 genera and 7 species like *Cyprinion watsoni, Channa striata, Labeo boggut, Labeo bata, Schizothorax, Aphanius ginaonis* and *Aphanius dispar* are mentioned in check list **(Table 1)** and the length-weight analysis for different fish species from Karez Sarawan was enumerated, presented in **(Table 2, 3)** and calculated as follows

Log W= -1.16 + 2.26 × Log L (*C. watsoni)*
Log W=- 1.30 + 2.33 × Log L (*C. striata*)
Log W= -2.55 + 3.71 × Log L (*L. bata*)
Log W= -1.18 + 2.34 × Log L (*L. buggut*)
Log W= -0.19 + 1.20× Log L (*Schizothorax sp.)*

As may be seen from the equations that the values of regression coefficient (b= 3) found be ideal growth in case of *L. bata* and satisfactory growth in *C. striata. L. buggut* and in *C. watsoni* (b = 2) poor growth in *Schizothorax sp* (b =1) from Karez Sarawan. The relative condition factor (Kn) for all fish samples was determined from 2.0 cm length groups from all specimen. Data of Kn is shown in tables 3(a, b and c). As may be noted from table of length- weight relationship and condition factor (Kn) values that specimen present in Karez Sarawan are in good (*L. bata*), satisfactory (*L. buggut, C. striata* and *C. watsoni* and poor condition (*Schizothorax sp*:) respectively. The Simpson's biodiversity index (1-D = 0.481) shows that the Karez has low ichthyic diversity. Diversity and their relative abundance in Karez presented in **(Table 4)** and **(Fig. 1)** respectively. It is an intense need to moniter water quality regularly and stock fish in the Karez to improve and enhance the diversity.

Table-1 Check list of Fish potential from Karez Sarawan

S. No.	Order	Family	Genus	Species	Common name
01	Cypriniformes	Cyprinidae	Cyprinids	watsoni	carp
02	Perciforms	Channidae	Channa	striata	Snake head
03	Cypriniformes	Cyprinidae	Labeo	bata	Bata labeo
04	Cypriniformes	Cyprinidae	Labeo	buggut	Labeo buggut
05	Cypriniformes	Cyprinidae	Schizothorax	sp:	Schizothorax
06	Cyprinodontiforms	Cyprinodontidae	Aphanius	ginaonis	-
07	Cyprinnodontiforms	Cyprinodontidae	Aphanius	dispar	-

Table-2 Data on length -weight of different groups of fishes from Karez Sarawan, Panjgoor Balochistan

Length group	*Cyprinion watsoni*		*Channa striata*		*Labeo boggut*	
	M T.L	M T L	M T L	M T W	M T L	M T W
4.1 – 6.0	5.3 ± 0.8	1.6± 1.4	4.8 ± 0.2	1.0± 0.1	5.2± 0.8	4.7± 1.3
6.1 – 8.0	7.2± 0.8	4.1 ±1.9	6.3 ± 0.7	3.0 ± 0.1	7.1 ± 0.9	5.2± 1.8
8.1 – 10. 0	8.8 ± 0.2	8.5 ± 1.5	9.0± 0.1	10.0 ± 1.0	8.8 ± 0.2	8.4± 1.6
10.1 – 12.0	11.5 ± 0.5	22.0 ± 2.0	11.1± 0.9	17.2 ± 1.8	11.0 ± 1.0	19.1± 1.9
12.1 – 14.0	-	-	13.2 ± 0.8	25.2 ± 1.8	-	-
14.1 – 16.0	-	-	14.5 ± 0.6	32.1 ± 1.9	-	-

Continue, length -weight of different groups of fishes from Karez Sarawan, Panjgoor Balochistan

Length Groups	*Labeo bata*		*Schizothorax*		*Aphanius ginaonis*		*Aphanius dispar*	
	M T L	M T W	M T L	M T W	M T L	M T W	M T L	M T W
2.1 – 4.0	-	-	3.9± 0.8	0.9± 1.0	-	-	-	-
4.1 – 6.0	5.5± 0.5	2.1±0.9	5.5± 0.5	1.6± 1.4	4.4±0.6	2.1± 0.9	4.6±0.4	1.5± 1.5
6.1 – 8.0	7.71± 0.3	6.1± 0.9	9.0± 1.0	7.1±1.9	6.5± 0.5	5.1± 0.9	-	-
8.1 - 10.0	8.63± 0.8	8.36± 0.5	10.8±1.2	12.1±1.9	-	-	-	-
10.1 – 12.0	10.4± 0.6	10.0± 1.0	13.0±1.0	22.0±1.0	-	-	-	-

Table-3 (a) Data on condition factor (Kn) of C. *watsoni* and *C. striata*

S.NO	*C . watsoni*			*C. striata*		
	Observed weight	Calculated weight	Kn	Observed weight	Calculated weight	Kn
1				0	5.0	0
2	0.22	0.39	0.5	0.47	0.54	1.1
3	0.66	0.62	1.0	1	0.94	1.0
4	0.93	0.76	1.2	1.23	1.12	1.0
5	1.34	0.97	1.3	1.40	1.30	1.08
				1.50	1.40	1.0
Mean			**1.0**			**1.18**

Table-3(b) Data on condition factor of L. *bata* and *L buggut*

	Labeo bata			*Labeo buggut*		
S/NO	Observed weight	Calculated weight	Kn	Observed weight	Calculated weight	Kn
1	0.32	0.19	1.6	0.67	0.66	1.0
2	0.78	0.71	1.0	0.72	0.71	1.0
3	0.92	0.90	1.0	0.95	0.90	1.0
4	1.0	1.19	1.1	1.28	1.24	1.0
	Mean		1.17			1.0

Table-4 Fish potential of Karez Sarawan

S.NO	Speciessspecies	Total (n*)	n-1	n(n-1)
1	Cyprinids watsoni	1898	1897	3600506
2	Channa striata	49	48	2352
3	Labeo bata	161	160	25760
4	Labeo buggut	284	283	52072
5	Schizothorax sp:	297	296	87912
6	Aphanius ginaonis	3	2	6
7	Aphanius dispar	2	1	2
Total		N** =2694		∑n(n-1)=3768610
		N-1 = 2693		D*** = ∑ n(n-1)/N(N-1) = 0.519 1-D = 0.481 1/D**** = 1.92
		N (N-1) = 7254942		

n=* number of species, N=Total number of specimens, 1-D= *** Simpson's Biodiversity Index, 1/D = **** Simpson's reciprocal index**

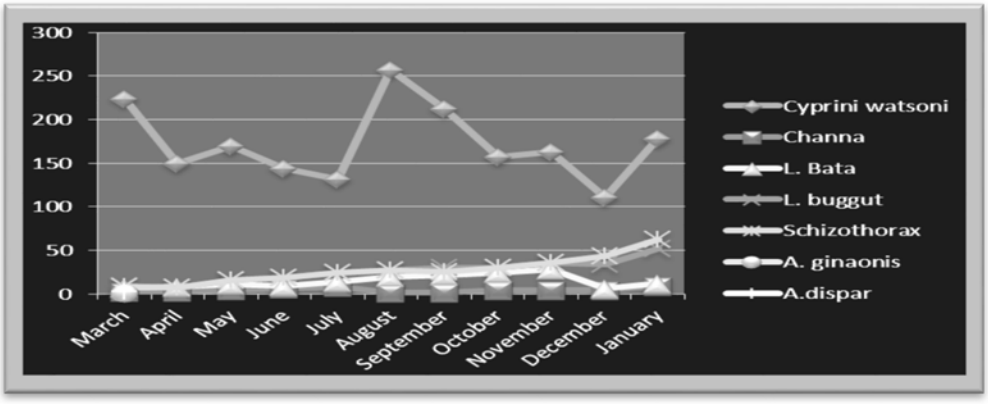

Fig-1 Relative abundance of fish potential from Karez Sarawan, Panjgoor Balochistan

4. DISCUSSION

It was concluded from the present study fish potential of Karez Sarawan, that there are 3 families, 4 genera and 7 species. Family Cyprinidae genus cyprinids and specie *Cyprinion watsoni* was recorded as dominant while *Channa striata, Labeo buggut, Labeo bata, Schizothorax sp: Aphanius ginaonis, Aphanius dispar* were found throughout the study period. Among the species *Cyprinion watsoni* was considered as the most abundant species (70.86%) of the total catch. These finding are in accords with the finding of Hasan *et al* (2015) reported Cyprinion *watsoni as* most abundant fish species which comprised (70.68%) of the total fish followed by *Schizothorax sp*. and *Labeo buggut* (11%). Diversity Kakarabdullahzai and Kakarsulemankhel, (2004) also reported *Cyprinion watsoni* as the most abundant one from Zhob River, Balochistan. According to Mirza *et al*. (2007) commented on specimens were

collected from Sawat, Pakistan belonged to 17 families, 39 genera and 51 species and found most abundant family Cyprinidae represented by (67%) of the total individual followed by Chandidae (10%). Taxonomically the most abundant family was Cyprinidae which was represented by 17 genera and 25 species as reported by earlier workers. These findings are in accordance with the present observations. Slight variation in the abundance of the carp species in the present study is might be due to different environmental conditions of the different provinces.

5. CONCLUSSION

- The Simpson's biodiversity index shows that the low ichthyic diversity.

- It was concluded that the environment of Karez Sarawan favors the potential of economically important carp *Labeo bata*.

- Finally it was concluded that an intense need to monitor water quality regularly and stock fish in the Karez to improve and enhance the diversity.

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