International Journal of Innovation and Applied Studies
ISSN 2028-9324 Vol. 10 No. 2 Feb. 2015, pp. 466-472

http://www.ijias.issr-journals.org/

Diversity of Edible Fishes at Rhound Stream District Dir Lower, Khyber Pakhtunkhwa Pakistan

Sana Ullah[1], Zaigham Hasan[2], Fawad Aziz[1], Imrana Amir[1], and Ibrar Muhammad[1]

[1]Fisheries and Aquaculture Lab, Department of Animal Sciences, Quaid-i-Azam University Islamabad, Pakistan

[2]Fisheries Lab, Department of Zoology, University of Peshawar Khyber Pakhtunkhwa, Pakistan

ABSTRACT: The present study was conducted from April through September 2013 to find out the edible fishes of Rhound Stream at District Dir Lower Khyber Pakhtunkhwa. Different types of nets and of various mesh sizes, and hooks were used for collecting fishes. During the study period, ten edible fish species were identified. Taxonomically, the collection was embodied to three orders, Cypriniformes, Channiformes and Mastacembeliformes and three families. The most abundant family was Cyprinidae represented by 7 genera and 8 species while Mastacembelidae and Channidae each were represented by only one species. The collected fish species were *Schizopyge esocinus, Raconma labieta, Cyprinion watsoni, Cyprinus carpio, Crossocheilus diplocheilus, Garra gotyla, Puntius ticto, Puntius sophore, Channa punctatus*, and *Mastacembelus armatus*. Our study revealed that Rhound stream is having rich edible fish fauna. If proper stocking is carried out, it can harbor more fish quantity and species, and may become the back bone area's economy.

KEYWORDS: River Panjkora, Rhound Stream, Check list, River Barandu, River Swat, Conservation.

1 INTRODUCTION

Aquatic water bodies covering 70% world's surface are one of the greatest hopes of humans for future food supplies [1]. Sea foods have always been a matter of interest for humans on account of having essential amino acids, protein, fatty acids, vitamins, carbohydrates and minerals [2]. Of all the sea foods, fish is more consumed commonly. Use as a stapled food item and key factor of water bodies around the world makes fish as the most important aquatic organism. As fishes are major part of human diet so research about fish fauna have been carried out throughout the world.

Fisheries sector is also providing employment and playing a predominant role in boosting up the economy of many countries [3]. Moreover it plays a major role in second trophic level of aquatic systems [4]. The fish fauna of any water body is an important feature of fishery perspective. The distribution of fish species vary due to different geographical and geological surroundings [5]. A lot of work has been carried out in various aquatic systems throughout Pakistan for evaluating the fish fauna. Although updated information is available regarding Ichthyofauna of most of the water bodies in Pakistan. Therefore the present study was conducted to know about the edible fish fauna of Rhound stream at District Dir Lower Khyber Pakhtunkhwa Pakistan.

2 MATERIALS AND METHODS

2.1 STUDY AREA

District Dir Lower is situated with Longitudes and Latitudes of 34º, 37' to 35º, 07' North and 71º, 31' to 72º, 14' East respectively with approximate 2700 feet (820 meter) above mean sea level [6]. District Dir Lower experience an annual rain fall of 1468.8mm and 253.7mm during December and March respectively [7]. District Dir is bounded by District Chitral to the

Northern Side, by Bajaur and Afghanistan to the Western side, by District Malakand to the Southern side and by District Swat to Eastern side [8]. River Panjkora originates from Kohistan, District Dir (Upper) and flow southward dividing District Dir Upper and Lower into two halves. River Panjkora joins River Swat at Bosaq pull, Sharbatti (behind Totakan, District Malakand) [9]. The name Panjkora is because of the main five tributaries that fall in the River at four different places at District Dir Upper (Gwaldi Stream at Sheringal, Barawal Stream at Chukiatan, Usherai Dara Stream and Nurhund Stream at Darora and Dobando Stream at Akhagram) while two tributaries fall into the River at two different places in District Dir Lower (Konhaye Stream at Koto and Round Stream at Thrai by pass) [10]. Figure 1 is showing study area.

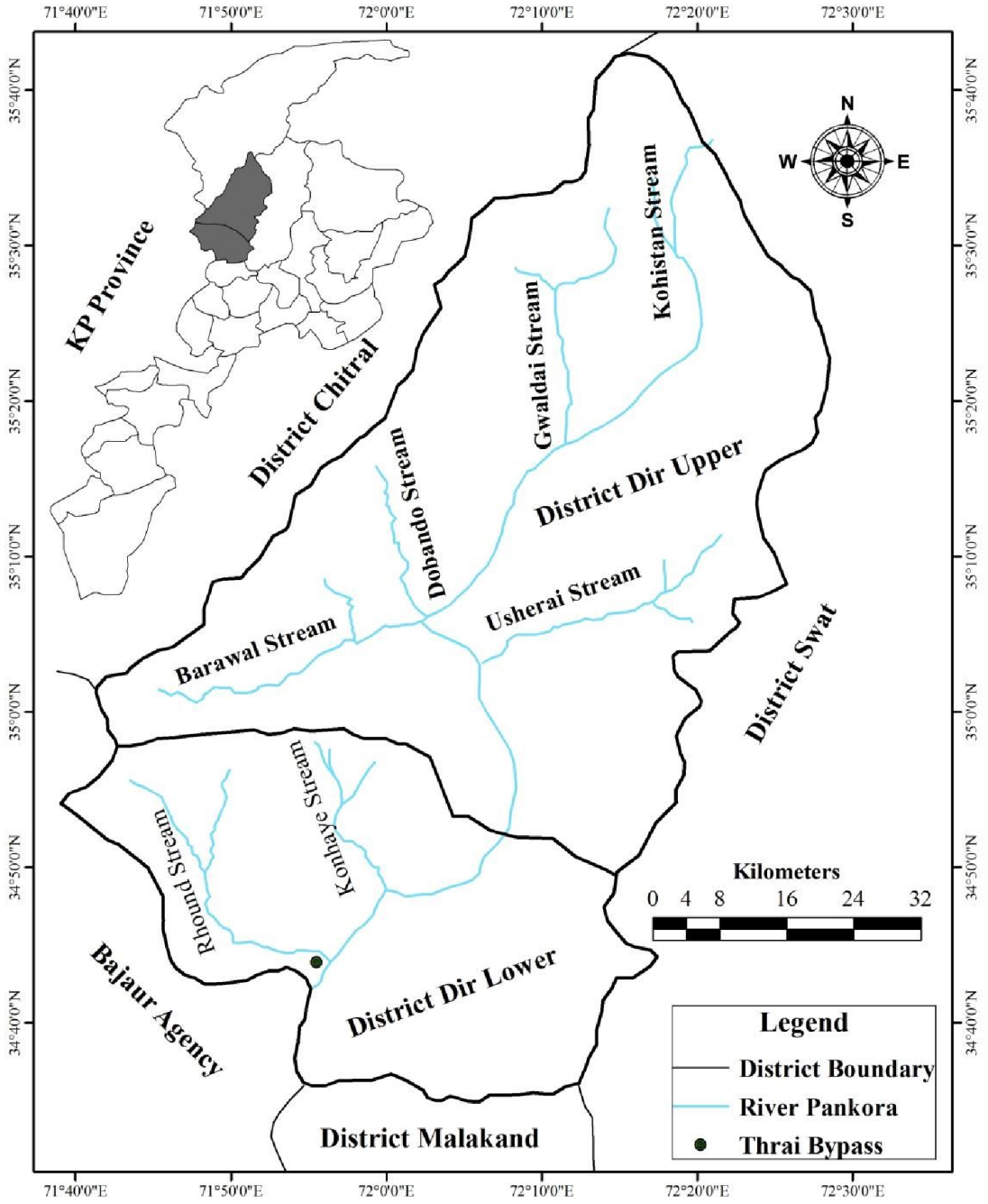

Fig. 1. Map showing study area

2.2 SAMPLING AND IDENTIFICATION

The fish collection was done twice a month, on every 15th and 30th of the month with the help of hand nets, cast nets, Patti nets and simple hooks. The samples were fixed in 10 percent buffered commercial grade formalin directly or after

intraperitonial injection of 10 percent formalin (in case of specimens larger than 15 cm) and were then transferred into 70 percent alcohol. All possible efforts were made in order to collect maximum number of species. Identification was made after consulting several standard keys and literature such as Fishes of the Punjab [11], Freshwater fishes of the Indian Region [12], Inland fishes of India and adjacent countries [13] and Pakistan ki Taza Pani ke Machliyan [14].

3 RESULTS AND DISCUSSION

During the study period ten edible fish species were identified. Taxonomically, the collection was embodied to three orders, Cypriniformes, Channiformes and Mastacembeliformes and three families. The most abundant family was Cyprinidae of order Cypriniformes represented by 7 genera and 8 species. On the other hand Mastacembelidae of order Mastacembeliformes and Channidae of Channiformes each were represented by only one fish species. The checklist of the identified fish species is given in Table 1. The diagnostic characters and morphometric measurements for these species are given in Table 2 and Table 3 respectively [15]. Fig. 2 to Fig. 11 are showing pictures of the recorded ten fish species.

Table 1: Checklist of Fish fauna of Konhaye Stream District Dir (Lower) with Local names

S. No	Order	Family	Genus and Species	Local names
1	Cypriniformes	Cyprinidae	*Schizopyge esocinus*	Ranth/ Aasala
2			*Racoma labiata*	Kanesatt
3			*Cyprinion watsoni*	Sabzug
4			*Cyprinus carpio+*	China kub
5			*Crossocheilus diplocheilus*	Butten
6			*Garra gotyla*	Kanesatt
7			*Puntius ticto*	Paplait
8			*Puntius sophore*	Paplait
9	Channiformes	Channidae	*Channa punctatus*	Asle Katasarre
10	Mastacembeliformes	Mastacembelidae	*Mastacembelus armatus*	Bam/ Marmahay

(+) = Exotic species

Ullah and Hasan [16] reported thirteen edible species from river Panjkora including Schizothorax esocinus, Schizothorax plagiostomus, Racoma labiata, Cyprinion watsoni, Cyprinus carpio, Tor putitora, Channa punctatus, Channa gachua, Tor macrolepis, Crossocheilus diplocheilus, Gara gotyla, Ctenopheringodon idella and Mastacembelus armatus. Puntius ticto and Puntius sophore were missing from their study while Tor putitora, Schozothorax plagiostomus, Ctenopheringodon idella, Channa gachua and Tor macrolepis were missing ones in present study.

Muhammad et al. [4] reported eleven fish species, among them eight were edible fish species, including Orienus plagiostomus, Oncorhynkus mykiss, Carassius auratus, Crossocheilus diplocheilus, Gara gotyla, Schizothorax esocinus (now known as Schizophyge esocinus), Channa punctatus and Racoma labiata from river Panjkora at District Dir Upper. In comparison to their study Orienus plagiostomus, Oncorhynkus mykiss and Carrasius auratus were missing from the present study while Cyprinion watsoni, Cyprinus carpio, Puntius ticto, Puntius sophore and Mastacembelus armatus were absent from their study.

Table 2. Diagnostic Characters of Ichthyofauna of Konhaye stream

S.No	Species	D	P	V	A	C	L.L
1	*Schizopyge esocinus*	4/8	20	10	3/5	19	95-98
2	*Racoma labiata*	4/8	20	11	3/5	19	110
3	*Cyprinion watsoni*	3/9-10	15	8	2/7	19	33-36
4	*Cyprinus carpio*	3/17	15	9	3/5	19	36-38
5	*Crossocheilus diplocheilus*	3/8	15	9	2/5	19	38
6	*Garra gotyla*	2/8	15	8	2/5	19	30
7	*Puntius ticto*	3/8-9	15	1/8	3/5	19	23-26
8	*Puntius sophore*	3/8-9	17	1/8	3/5	19	23-26
9	*Channa punctatus*	29-32	17	6	21-23	12	37-40
10	*Mastacembelus armatus*	32-39	23	-	3/75-8	-	-

D=Dorsal fins, P=Pelvic fins, V=Ventral fins, A=Anal fins, C=Caudal fins, L.L=Lateral Line Scales

Hasan et al. [17] worked on River Swat and reported fifty fish species consisting of sixteen edible fish species viz. Carassius auratus, Channa gachua, Channa puntatus, Crossocheilus diplocheilus, Clupisoma garua, Clupisoma naziri, Cyprinus carpio, Eutropiichthys vacha, Labeo diplostomus, Mastacembuls armatus, Mystus bleekeri, Oncorhynchus mykiss, Racoma labiata, Salmo trutta fario, Schizothorax plagiostomus and Tor macrolepis after their survey from 2004 and 2010. While comparing these two studies, the species of our study were present in their study as well.

Ullah et al. [18] reported eleven species from Konhaye stream from the same district and tributary of the same river Panjkora. Their collection were including *Schizopyge esocinus, Raconma labieta, Cyprinion watsoni, Cyprinus carpio, Crossocheilus diplocheilus, Garra gotyla, Puntius ticto, Puntius sophore, Channa Punctatus, Channa gachua* and *Mastacembelus armatus*. All the edible fishes of the both the tributaries are similar due to the same prevailed climate and environment. The present study was missing *Channa gachua* which is quite established in Konhaye stream.

Fig. 2. Schizopyge esocinus

Fig. 3. Racoma labiata

Hasan et al. [19] collected a total of sixteen fish species of the three streams (Salarzai stream, Mamund stream and Nawagai stream) of Bajaur Agency. Their collection was consisting of *Puntius ticto, Puntius conchonius, Barilius modestus, Barilius pakistanicus, Barilius vagra, Crossocheilus diplocheilus, Salmophasia punjabensis, Carassius auratus, Schizothorax plagiostomus, Channa gachua, Channa punctatus, Mastacembelus armatus,* and *Glyptothorax punjabensis*. They recorded eight edible fishes. While comparing these two works, our study was having more edible fish species as compare to their study.

Fig. 4. Cyprinion watsoni

Fig. 5. Cyprinus carpio

Fig. 6. Crossocheilus diplocheilus

Fig. 7. Garra gotyla

Fig. 8. Puntius ticto

Fig. 9. Puntius sophore

Fig. 10. Channa punctatus

Fig. 11. Mastacembelus armatus

During the present study one exotic edible fish species namely *Cyprinus carpio* (common carp) was also collected while the rest nine fish species were indigenous. If compared with the adjoin streams and rivers, Rhound stream and Konhaye stream both are within the same district and both are having approximately the same edible fish fauna. All the ten species recorded in the present study are present in Konhaye stream, River Panjkora and River Swat. Relatively Rhound stream is more diverse than three different streams including Salarzai stream, Mamund stream and Nawagai stream of Bajaur Agency while less diverse than river Panjkora, river Barandu of district Buner and river Swat.

Table 3: Morphometric measurements (cm) of the recorded fish species

S. No	Fish Species	T.L	F.L	S.L	H.L	E.D	P.O.L	B.D
1	*Racoma labiata*	14	13.2	12	3.6	0.5	6.6	2.6
2	*Channa punctatus*	16.5	13.5	5	3	0.6	15.1	3
3	*Cyprinion watsoni*	13.7	11	12.8	2.5	0.8	1.5	4
4	*Cyprinus carpio*	16	13	12	3	0.6	1.9	4.3
5	*Mastacembelus armatus*	23.5	21	3.9	2.4	0.2	22.6	2
6	*Crossocheilus diplocheilus*	12	11	8.5	1.5	0.5	11	2.2
7	*Garra gotyla*	13.9	12.4	12.5	2.6	0.4	12.7	3
8	*Puntius ticto*	10.7	8.6	11.4	2.0	0.4	4.7	1.9
9	*Puntius sophore*	13.1	10.9	12.1	2.2	0.7	5.9	2.2
10	*Schizopyge esocinus*	23.6	22.8	19.5	4	0.8	0.3	4

T.L = Total Length, F.L= Fork Length, S.L = Standard Length, H.L = Head Length, E.D = Eye Diameter, P.O.L = Post Orbital Length and B.D = Body Depth

4 CONCLUSION

Concerning the edible ichthyodiversity ten fish species viz. *Schizopyge esocinus, Raconma labieta, Cyprinion watsoni,* Cyprinus carpio, Crossocheilus diplocheilus, Garra gotyla, Puntius ticto, Puntius sophore, Channa Punctatus and Mastacembelus armatus were recorded from Rhound stream. Our study showed that the stream can harbor more fish species and can be used for conserving endangered species as well. The current status of edible fish fauna can be improved by monitoring fish fauna regularly. Water quality of the stream should be assessed regularly. Stocking of new fish should be carried out. Regular fishing as well as fishing of non-marketable size fish should be avoided. Conditions favoring fish fauna and its distribution should be prevailed.

ACKNOWLEDGMENT

We are thankful to Muhammad Ikram, Zia Ur Rahman and Atta Ullah for their kind efforts during fish collection.

DISCLOSURE

None of the authors have any conflict of interest.

REFERENCES

[1] P. Raja, S. Veerasingam, G. Suresh, G. Marichamy and R. Venkatachalapathy, "Heavy metals concentration in Four Commercially Valuable Marine Edible Fish Species from Parangipettai Coast, South East Coast of India," *International Journal of Animal and Veterinary Advances*, vol. 1, no. 1, pp. 10-14, 2009.

[2] S. Ullah, and T. Ahmad, "Nutritional and Medical Importance of Fish: A Mini Review," *Reviews of Progress*, vol. 2, no. 2, pp. 1-5, 2014.

[3] C.M. Nagabhushan and B.B. Hosetti, "Diversity of Ichthyo-Fauna in Relation to Physico-Chemical characters of Tungabhadra Reservoir, Hospet," Wetlands, biodiversity and climate change. pp: 1-9, 2010.

[4] I. Muhammad, Z. Hasan, S. Ullah, W. Ullah and H. Khan, "A preliminary survey of fish fauna of river Panjkora at District Upper Dir, Khyber Pakhtunkhwa Pakistan," *Journal of Biodiversity and Environmental Sciences,* vol. 5, no. 1, pp. 362368, 2014.

[5] H.M. Shaikh, S.M. Kamble and A.B. Renge, "The study of Ichthyofauna diversity in Upper Dudha Project water researvoir near Somthana in Jalna District (MS) India," *Journal of Fisheries and Aquaculture*, vol. 2, no. 1, pp. 8-10, 2011.

[6] S. Ullah, M.W. Javed, I. Muhammad and W. Ullah, "Physico-Chemical Analysis of Tube Wells' Water at District Dir Lower, Khyber Pakhtunkhwa Pakistan," *Pukhtunkhwa Journal of Life Sciences*, vol. 2, no. 1, 28-37, 2014.

[7] S. Ullah, M.W. Javed, S.B. Rasheed, Q. Jamal, F. Aziz and S. Ullah, "Assessment of groundwater quality of district Dir Lower Pakistan," *International Journal of Biosciences*, vol. 4, no. 8, pp. 248-255, 2014.

[8] S. Ullah, N. Ullah and T. Ahmad, "Assessment of Dug Wells' Water for Drinking and Irrigation Purposes at District Dir Lower, Khyber Pakhtunkhwa Pakistan," *American Journal of Life Science Researches*, vol. 2, no. 4, pp. 466-473, 2014.

[9] S. Ullah, N. Ullah, K. Rahman, T.M. Khan, M.A. Jadoon and T. Ahmad, "Study on Physicochemical Characterization of Konhaye Stream District Dir Lower, Khyber Pakhtunkhwa Pakistan," *World Journal of Fish and Marine Sciences*, vol. 6, no. 5, pp. 461-470, 2014.

[10] S. Ullah, "GIS Integrated Approach for Assessing Drinking Water Quality," *VDM Publishing Heinrich-Böcking-Str. 6-8 D - 66121 Saarbrücken Germany*. pp. 24-25, 2014.

[11] M.R. Mirza and I.A. Sandhu, "Fishes of the Punjab," *Polymer Publications Lahore*, 2007.

[12] K.C. Jayaram, "Freshwater Fishes of the Indian Region," *Narendra Publishing House, Delhi, India*, 1999.

[13] P.K. Talwar and A.G.K. Jhingran, "Inland fishes of India and adjacent countries," *Oxford and IBH publishing Co. Pvt. Ltd., New Delhi*, 1991.

[14] M.R. Mirza, "Pakistan Ki Taza Pani Ki machliyan," *Polymer Publications Lahore*, 1990.

[15] S. Ullah, Z. Hasan, S. Ahmad, M. Rauf and B. Khan, "ichthyofaunal diversity of rhound stream at district Lower Dir, Khyber Pakhtunkhwa Pakistan," *International Journal of Biosciences*, vol. 4, no. 8, pp. 241-247, 2014.

[16] S. Ullah and Z. Hasan, "The Edible Fishes of River Panjkora at District Dir Lower, Khyber Pakhtunkhwa," *PUTAJ (Sciences).* Accepted for Vol. 20, 2013.

[17] Z. Hasan, I. Ahmed, M. Yousuf, L. Rehman and J. Khan, "Fish Biodiversity of River Swat," *Pakistan Journal of Zoology*, vol. 45, pp. 283-289, 2013.

[18] S. Ullah, Z. Hasan and Maryam, "The Edible Ichthyofauna of Konhaye Stream District Dir Lower, Khyber Pakhtunkhwa," *Pakhtunkhwa Journal of Life Sciences*. Accepted for coming issue, 2014.

[19] Z. Hasan, W. Khan, M.A. Khan, L. Rehman, J. Khan and S. Ullah, "Comparative Abundance of Fish Fauna of Different Streams of Bajaur Agency, Khyber Pakhtunkhwa, Pakistan," *Biologia (Paksitan),* vol. 60, no. 1, pp. 159-163, 2014.