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Ichthyofaunal diversity of thaila (*Catla catla*), Singhara (*Sperata sarwari*) and Mulee (*Wallago attu*) in river Indus of Pakistan

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Abstract

Fishes are the aquatic cold blooded animals, respire by gills, swimming by fins and body is covered by scales. The current study was to investigate the ichthyofaunal diversity of *Catla catla*, *Sperata sarwari* and *Wallago attu* in River Indus. In the present study, total of 8065 fish species such as *Sperata sarwari*, *Catla catla* and *Wallago attu* were recorded in 4 months (January 2018 to April 2018) of the year were collected from three sites of Jhoke Sohlan, Jhoke Rabnawaz and Jhoke Jandir respectively. The overall catchment of 3659 species of *Sperata sarwari,* 1305 species of *Catla catla* and 3101 species of *Wallagoattu* were recorded from three sites. The percentile values of three sites such as Jhoke Sohlan, Jhoke Rabnawaz and Jhoke Jandir were documented with range of 34.38%, 30.3% and 35.32%, respectively. It is concluded that the conservation of fish biodiversity and control of aquatic pollutions like (pesticides, industrial chemicals etc) and fisheries worker should be active. Fisheries department should protect it and to enhance the fish biodiversity because it is the evidence to provide proteins to the human population.

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Introduction

Thaila or Thali, (*Catlacatla*) is one of the most important food fish. Body structure is small deep with protruding head, large reversed mouth. Barbells absent with no fringed lips and mostly used zooplankton as a food. Dorsal shape is more convex that of ventral, dorsal fin starts somewhat in advance of the ventrals, mostly used zooplankton as a food.

The maximum size of the body is 1.82m respectively (Memon, 2011). Singhara (*Sperata sarwari*) is the big freshwater catfish fish through the rivers, dames and in linked watersheds of the Indian subcontinent. Extreme length for Singharais recorded as150 cm respectively (Talwar and Jhingran, 1991; Mirza, 2003).Length and weight associations have been broadly used in the investigation of fishery findings due to practical problems and time mandatory to note the weight in the arena (Froese, 2006). Mulee or Jarko (*Wallago attu*) is highly predacious. Body structure is long and pressed laterally and head is big with two pairs of barbells.

It is generally yellowish grey with back silvery on sides and maximum size reaches 1.8m respectively. Jaw somewhat longer, while teeth many and vomerine teeth is present (Memon, 2011). Ichthyofaunal diversity is the relative fullness of fish species in the particular region (Burton *et al.*, 1992). Somescholars have been worked on the different type of fish fauna present in variedarea of the world. Furthermore, some work had also finished their spreading of fresh water fish fauna of Pakistan. In Pakistan, greater than 186 freshwater fish species have been clarified (Helfrich and Neves, 2009).The carps are the important water diet object, where chief carps are the commercial fish kind of Pakistan. These carps are like, Thaila (*Catla catla*), Rohu (*Labeo rohita*) and Mori (*Cirrhinus mrigala*) are dignified as chief basis of protein from Pakistani waters forms. Due to their great commercial retails, all of these fish types are refined in significance base. Unfortunately, normal standard of these excessive commercial valued fish has been declined. Therefore seeing the rank of these commercial species, current study was showed. Some inspection on the rank of such important species also has been presented from other areas of Pakistan, like Hub reservoir and Gomalriver (Mirza *et al.*, 1995, Abeda and Afsheen, 2014). Current study was investigated the fish fauna of Thaila (*Catla catla*), Singhara (*Sperata sarwari*) and Mulee (*Wallago attu*) in river Indus of Pakistan.

Materials and methods

Study area

The river Indus starts in North of Pakistan, flow in the southern direction and directly entered into the Arabian Sea at Karachi. The total length of river Indus is 3180 km (1976 miles). The estimated annual flow is 207 km^3**.** The total length of river Indus in D.I. Khan Side is 180 km respectively. The river entered into D.I. Khan at Chasma side and ended at Ramak (tehsil of D.I. Khan).

Collection, preservation and identification

Fishes were collected from three main sites namely Jhoke Jandir, Jhoke Sohalan and Jhoke Rabnawaz of the D.I. Khan in which the river Indus is passed through it. The survey was completed in 4 months (January to April) of the year. The fishes were captured by the angling and nets. Small fishes were conserved directly in 10% formalin solution in bottle, while large fishes were cut their abdomen and preserved and identified up to species level according to related literature and key (Talwar and Jhingran, 1991) available.

Relative abundance

Relative abundance is the dividing total number of specimens of a particular species with total number of specimens of all species and then multiplying it with 100 by the following formula.

$$\text{Relative abundance} = \frac{\text{Total number of specimens of particular species}}{\text{Total number of specimens of all species}} \times 100$$

Results

In the present study, total of 8065 fish species such as *Sperata sarwari*, *Catla catla* and *Wallago attu* were recorded in 4 months (January to April) of the year who collected from three sites of Jhoke Sohlan, Jhoke

Rabnawaz and Jhoke Jandir respectively. The overall catchment of 3659 species of *Sperata sarwari,* 1305 species of *Catla catla* and 3101 species of *Wallago attu* were recorded from three sites. In January the overall catchment was recorded with range of 1739 from three sites respectively (Table 1).

Table 1. Ichthyofaunal diversity, collected from three sites of river Indus at D.I. Khan.

January									
	Jhoke Sohlan			Jhoke Rabnawaz			Jhoke Jandir		
Week	Thaila	Singhara	Mulee	Thaila	Singhara	Mulee	Thaila	Singhara	Mulee
1	26	90	64	15	115	15	15	105	89
2	17	44	57	22	53	13	22	53	83
3	19	60	70	20	63	12	17	65	70
4	23	70	80	27	80	9	24	72	60
Total	85	264	271	84	311	49	78	295	302
Mean	21.25	66	67.75	21	77.75	12.25	19.5	73.75	75.5

Thaila (*Catla catla*); Singhara (*Speratasarwari*) and Mulee (*Wallago attu*).

In February the overall catchment was recorded with range of 2532 from three sites of river Indus. In JhokeSohlan, JhokeJandir sites the higher range of *Wallagoattu*(339), (396) were documented, while 369 species of *Speratasarwari* were recorded from JhokeRabnawaz site (Table 2).

Table 2. Ichthyofaunal diversity of three sites collected from river Indus.

February									
	Jhokesohlan			JhokeRabnawaz			JhokeJandir		
Week	Thaila	Singhara	Mulee	Thaila	Singhara	Mulee	Thaila	Singhara	Mulee
1	32	85	97	21	112	40	57	95	92
2	49	64	87	37	99	90	52	105	120
3	38	75	80	31	85	75	45	90	95
4	25	80	*75*	25	73	83	49	85	89
Total	144	304	339	114	369	288	203	375	396
Mean	36	76	84.75	28.5	92.25	72	50.75	93.75	99

Thaila (*Catla catla*); Singhara (*Sperata sarwari*) and Mulee (*Wallago attu*).

In March the overall catchment of three fish species was documented with range of 2033 respectively. Higher range 372 of *Sperata sarwari* and while lower value 113 of *Catla catla* was recorded from Jhoke Sohlan site. Similarly greater 327 and lower 97 values of *Sperata sarwari* and *Catla catla* were recorded from the Jhoke Rabnawaz site. In Jhoke Jandir site higher value was 260 of *Sperata sarwari* and lower value was 95 of *Catla catla* (Table 3).

Table 3. Fish biodiversity of river Indus at D.I. Khan.

March									
	Jhoke Sohlan			Jhoke Rabnawaz			Jhoke Jandir		
Week	Thaila	Singhara	Mulee	Thaila	Singhara	Mulee	Thaila	Singhara	Mulee
1	21	62	40	39	84	58	33	79	58
2	37	140	90	20	89	63	19	68	48
3	31	80	75	23	72	55	22	60	55
4	24	90	83	15	82	80	21	53	64
Total	113	372	288	97	327	256	95	260	225
Mean	28.25	93	72	24.25	81.75	64	23.75	65	56.25

Thaila (*Catla catla*); Singhara (*Sperata sarwari*) and Mulee (*Wallago attu*).

In April the overall catchment of three fish species was documented with range of 1761 respectively.

The higher value of *Sperata sarwari* (267) and lower value was *Catla catla* (100) recorded from Jhoke Sohlan.

In Jhoke Rabnawaz site the greater value 269 of *Sperata sarwari* and lower value 81 of *Catla catla* were documented. Similarly greater and lower values were *Wallago attu* (262) and *Catla catla* (111) recorded from the Jhoke Jandir site respectively (Table 4).

Table 4. Fish biodiversity of river Indusat D.I. Khan.

	April								
	Jhoke Sohlan			Jhoke Rabnawaz			Jhoke Jandir		
Week	Thaila	Singhara	Mulee	Thaila	Singhara	Mulee	Thaila	Singhara	Mulee
1	34	111	46	15	98	40	35	95	47
2	21	50	60	23	75	43	29	60	60
3	15	61	45	26	56	60	21	40	80
4	30	45	75	17	40	56	26	51	75
Total	100	267	226	81	269	199	111	246	262
Mean	25	66.75	56.5	20.25	67.25	47.66	27.75	61.5	65.5

Thaila (*Catla catla*); Singhara (*Sperata sarwari* and Mulee (*Wallago attu*).

From Jhoke Sohlan site, total of *Sperata sarwari, Catla catla* and *Wallago attu* were recorded with values of 1207, 442 and 1124, respectively. Total of 1276 of *Sperata sarwari*, 376 of *Catla catla* and 792 of *Wallago attu* were documented from Jhoke Rabnawaz site. Similarly *Sperata sarwari* (1176), *Catla catla* (487) and *Wallago attu* (1185) were documented from Jhoke Jandir site.

The percentile values of JhokeSohlan site were 32.98% *Speratasarwari*, 33.86% *Catlacatla*and 36.24% of *Wallagoattu* respectively. From JhokeRabnawaz site the recorded range of *Speratasarwari* (34.88%), *Catlacatla*(28.82%) and *Wallagoattu*(25.54%) respectively. Similarly 32.14%, 37.32% and 38.22% of *Speratasarwari, Catlacatla* and *Wallagoattu* were documented from the JhokeJandir site.

The percentile values of three sites such as Jhoke Sohlan, Jhoke Rabnawaz and Jhoke Jandir were documented with range of 34.38%, 30.3% and 35.32% respectively. The overall values of three sites such as Jhoke Sohlan, Jhoke Jandir and Jhoke Rabnawaz were recorded with range of 2773, 2848 and 2444 respectively.

Discussion

In the present study total of 8065 fish species such as *Sperata sarwari*, *Catla catla* and *Wallago attu* were recorded in 4 months (January to April) of the year who collected from three sites of Jhoke Sohlan, Jhoke Rabnawaz and Jhoke Jandir respectively. The overall catchment of 3659 species of *Sperata sarwari,* 1305 species of *Catlacatla* and 3101 species of *Wallago attu* were recorded from three sites. In January, February, March and April, the overall catchment was recorded with range of 1739, 2532, 2033 and 1761 from three sites respectively. Saeed *et al.*, 2013 conducted a study on river Barandu district Buner Pakistan and collected 11 species, of which 11 different genera, 4 families and 3 orders. A study was conducted by the Ugurlu and Polat, 2008 and recorded 5 species; of which 5 different genera 2 different families and 3 orders from Karaabdal stream. Khan and Hasan, 2014 arranged a study on district Karak and collected 21 species belonging 14 different genera, 4 families and 4 orders were documented followed by the total 1794 catchment. Another study on conducted by the Yousafzai *et al.*, 2013and collected a total of 38 fish species. Among these 22 different genera, 9 families and 6 orders were recorded from the river Swat at Charsadda

Khyber Pakhtunkhwa Pakistan. In this study the Cyprinidae family was most abundant represented by the 20 species. A study was conducted by the Shinde *et al.*, 2009 who recorded total of 15 species, of which 12 different genera 4 families and 3 orders were reported from Harsool-savangi reservoir. Total of 10 species from the river Barandu district Buner Pakistan, of which 10 different genera, 4 families and 3 orders were recorded by the Akhtar *et al.*, 2014. The current study findings were higher as compared to the above mentioned studies because river Indus is so much secured from irregular angling and industrial pollution at D.I. Khan site.

Conclusion

From the current study it was concluded that the biodiversity of Thaila (*Catlacatla*), Singhara (*Speratasarwari*) and Mulee (*Wallagoattu*) in river Indus of D.I. Khan region are abundance. River Indus is a strong aquatic structure with respect to the biodiversity of fish and place of living of many species. Harsh rules regulations should be monitored for the conservation of fish biodiversity and control of aquatic pollutions like (pesticides, industrial chemicals etc) and fisheries worker should be active to bane the unlawful angling. Irregular and electric angling should be strictly banned.

The department of the fisheries should protect the water bodies and to enhance the fish biodiversity because it is the evidence to provide proteins to the human population.

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