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Study of the Fresh Water Fish Diversity of Kanjha Kothi Lake of Purnia

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Abstract

Fish survey were undertaken during August 2015 to January 2016 to predict the diversity of the fishes in Kanjha Kothi Lake of Purnia . An attempt has been made to survey the existing fish diversity in six months of duration in two consecutive seasons (rainy and winter). Fishes caught alive or in fresh condition were preserved in 9-10% formalin solution. The fishes were collected, fixed and labeled giving serial numbers, the name of exact locality from where they have been collected; date of the collection and the common local name on each jar. The fishes were identified and finally species diversity was calculated, which is not yet focused at this site. Knowledge of highest diversity in a particular season can be a most useful tool for the aquaculture for both quantity and quality harvesting of the fishes. With this point of view, the research has been conducted. Species diversity was found to be higher in winter (1.47) than in rainy season (1.18).

Keywords: Fish diversity, Kanjha Kothi Lake , Purnia

Introduction

Fish constitutes almost half of the total number of vertebrates in the world. They live in almost all conceivable aquatic habitats. They exhibit enormous diversity of size, shape and biology, and in the habitats they occupy. Of the 39,900 species of vertebrates in the world, Nelson (1984) estimated 21,723 extant species of fish under 4,044 genera, 445 families and 50 Orders in the world, compared to 21,450 extant tetrapods. Of these, 8,411 are freshwater species and 11,650 are marine. Other researchers, have arrived at different estimates, most of which range between 17,000 and 30,000 for the numbers of currently recognized fish species. The eventual number of living fish species may be close to 28,000 in the world. Day (1889) described 1418 species of fish under 342 genera from the British India. The fish fauna of the major tropical regions, Southern Asia, Africa, South and Central America are generally different with respect to genera; but, some families have members in two or all of the continents. In Southern Asia the predominant fish groups are the carps (Cyprinidae) and the cat fishes (Siluroidea) (Berra, 1981). Koshi is the one of the biggest river of Bihar. It is also known as saptakoshi river. Koshi flows from eastern Nepal. Different branches of koshi are originated from different mountains with different names and they are flowing towards southeast, southwest and direct south. After reaching near Triveni, Arun and Sunkoshi and later on Tamor join each other and flow downward to the south with the name Saptakoshi. The water, east from Goshainkunda of central Nepal and to the west of Kanchangunjha of eastern Nepal collects to this river covering a large area of high mountains and hills. Out of its main seven branches, Arun and Bhotekoshi are originated from Tibet. Hence, Arun River enters Nepal from Kimathanka pass or boarder and the Bhotekoshi River enters Nepal from Tatopani pass. Latter on the Saptakoshi River enters towards India, Bihar from Bhimnagar. Therefore, the water-shared area for Koshi River is very big.

Materials and Methods

The fishes were collected from the Kanjha Kothi Lake of Purnia on season basis. After proper preservation in formalin the fishes were brought to the laboratory for identification. The following formulas has been applied for calculations,

Species diversity calculation for rainy season H=

$$\frac{n\log n - \Sigma fi \log fi}{n}$$

$$= \frac{3100\log 3100 - 7158.662}{3100}$$

$$= \frac{10823.22 - 7158.662}{3100}$$ Where,

= 1.18

H= index of species diversity n = total individuals

fi = number of individual species.

To calculate Jackob's coefficient,

$$= \frac{H}{H\ max}$$

$$= \frac{H}{LogK}$$

$$= \frac{1.18}{1.55}$$

= 0.76 Where,

J = relative diversity H = observed diversity

H max = proportion of maximum possible diversity, H max = Log K

K= number of species present

Species diversity calculation for winter season H=

$$\frac{n\log n - \Sigma fi \log fi}{n}$$

$$= \frac{4695\log 4695 - 10316.68}{4695}$$

$$= \frac{17238.32 - 10316.68}{4695}$$

= 1.47Where,

H= index of species diversity n = total individuals

fi = number of individual species.

To calculate Jackob's coefficient,

$$J = \frac{H}{H\ max}$$

$$= \frac{H}{LogK}$$

$$= \frac{1.47}{Log\ 59}$$

= 0.83

Where, J = relative diversity , H = observed diversity ,H max = proportion of maximum possible diversity, H max = Log K , K= number of species present

Results and Discussion

The present study reveals species diversity, 1.47and relative diversity, 0.83 in winter season. The species diversity is, 1.18 and relative diversity, 0.76 in the rainy season. In the period of six months in two consecutive seasons, species diversity and relative diversity; both of them is found to be maximum in winter season than in rainy season.

Table1:Details of the fish collected from Kanjha Kothi Lake of Purnia

S. No.	Name of the fishes	Rainy Season				Winter Season					
		Aug	Sep.	fi	filogfi	Oct.	Nov	Dec.	Jan.	fi	FIlogfi
1.	Labeo rohita	260	300	300	743.13	260	160	170	800	800	2322.47
2.	Parambassis ranga	15	-	15	17.64	-	10	14	5	14	16.04
3.	Mystus cavasious	200	400	400	1040.82	300	250	225	100	300	743.13
4.	Mastacembelus armatus	100	90	100	200	20	-	80	-	80	152.24
5.	Clupisoma montana	500	-	500	1349.485	-	300	180	200	300	743.13
6.	Catla catla	100	40	100	200	60	80	-	27	80	152.24
7.	Labeo bata	300	-	300	743.13	200	270	300	400	400	1040.82
8.	Salmophasia bacaila	300	-	300	743.13	200	125	200	250	250	599.48
9	Macrognathus pancalus	50	-	50	84.94	20	-	35	30	35	54.04
10	Botia lohachata	50	30	50	84.94	15	40	-	-	40	64.08
11	Puntius sophore	30	20	30	44.31	-	130	-	30	130	44.31
12	Macrognathus aral	120	100	120	249.50	80	120	-	76	120	249.50
13	Cirrhinus mrigala	255	220	255	613.667	190	260	-	195	260	627.89
14	Channa punctatus	30	25	30	44.31	35	39	-	34	39	62.05
15	Trichogaster fasciata	24	20	24	33.12	18	10	15	20	20	26.02
16	Badis badis	20	40	40	64.88	35	22	-	10	35	54.04
17	Heteropneustes fossilis	25	20	25	34.94	40	45	77	150	150	326.41
18	Parambassis lala	14	15	15	17.64	16	14	-	15	16	19.26
19	Leiodon cutcutia	-	6	6	4.66	-	7	-	-	7	5.91
20	Gagata cenia	26	25	26	36.78	-	19	-	20	20	26.02
21.	Mystus vittatus	22	-	22	29.53	30	25	-	35	35	54.04
22.	Chaca chaca	-	-	-	-	10	-	-	-	-	-
23.	Sperata aor	25	-	25	34.94	16	20	-	10	20	26.02
24.	Chagunius chagunio	-	-	-	-	-	120	-	80	120	249.50
25.	Raiamas guttatus	-	-	-	-	-	120	-	-	120	249.50
26.	Tor tor	-	25	25	34.94	-	32	30	18	32	48.16
27.	Eutropichthys vacha	55	-	55	95.71	45	60	-	-	60	106.68
28.	Mystus tengara	180	170	180	405.94	160	200	-	100	200	460.20
29.	Xenentodon cancilla	21	22	22	29.53	-	20	-	6	20	26.02
30.	Ompok bimaculatus	-	-	-	-	13	15	-	14	15	17.64
31.	Labeo fimbriatus	4	5	5	3.49	6	-	9	2	9	8.58
32.	Monopterus cuchia	-	-	-	-	10	12	-	-	12	12.95
33.	Channa orientalis	50	40	50	84.94	53	45	-	40	53	91.38
34.	Glossogobius giuris	-	-	-	-	-	-	-	6	6	4.66
35.	Chanda nama	-	-	-	-	10	9	11	6	11	11.45
36.	Nangra assamensis	30	25	30	44.31	-	-	-	-	-	-
37.	Canthophrys gongota	30	25	30	44.31	-	-	-	-	-	-
38.	Ctenopharyngodon idella	-	-			-	9	19	6	19	24.29
39.	Clarias batrachus	-	-			-	-	75	60	75	140.62
40.	Clupisoma garuwa	-	-			-	14	19	12	19	24.29
41.	Barbonymous gonionotus	-	-			-	50	98	150	150	326.41
42.	Cyprinus carpio	-	-			-	25	39	30	39	62.05
43.	Hypothalmichthys nobilis	-	-			-	87	96	90	96	190.29
44.	Notopterus notopterus	-	-			-	130	142	145	145	313.39
45.	Puntius terio	-	-			-	17	19	19	19	24.29
46.	Anabus testudinous	-	-			-	17	19	15	19	24.29
47.	Glyptothorax telchitta	-	-			-	-	9	6	9	8.58
48.	Labeo calbasu	-	-			-	4	-	8	8	7.22
49.	Chela cachieus	-	-			-	-	-	6	6	4.66
50.	Nandus nandus	-	-			-	-	-	10	10	10
51.	Nandus meni	-	-			-	13	-	15	15	17.64
52.	Channa gachuwa	-	-			-	19	11	12	19	24.29
53.	Cabdio maror	-	-			-	130	120	115	130	274.81
54.	Channa striatus	-	-			-	-	5	-	5	3.49
55.	Barilius barna	-	-			-	-	8	7	8	7.22
56.	Hypothalmichthys molitrix	-	-			-	35	37	30	37	58.02
57.	Wallago attu	-	-			-	-	-	23	23	31.31
58.	Puntius conchonius	-	-			-	11	12	15	15	17.64
59.	Lepidocephalichthys	-	-			-	-	17	20	20	26.02
				n =3100	∑ filogfi= 7158.662					= 4695	∑ filogfi= 10316.68

Conclusion

Fish diversity is supposed to be maximum in winter season. So, it is appropriate to harvest both quantitatively and qualitatively in winter season. Further scientific research is better to be focussed in this season by the future researchers.

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