



A preliminary study on the ichthyospecies composition of Panishala Beel in the Cooch Behar district of West Bengal, India

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Abstract

The present study deals with the ichthyospecies diversity of Panishala Beel of Cooch Behar District of West Bengal, India. The Panishala Beel lies in the geographical ordinates between 26°16'14''N latitude 89°31'46''E longitudes. A survey was conducted on composition of fish fauna of the Panishala Beel from December, 2016 to November, 2017. During the study, 39 fish species belonging to 28 genera under 16 families from 8 orders was recorded. According to IUCN red list, 1 species is belongs to vulnerable status, 1 species is in data deficient category, 30 species are least concern and other 7 species are not evaluated. The 16 different families recorded in the study are Belonidae, Cyprinidae, Cobitidae, Aplocheilidae, Notopteridae, Ambassidae, Anabantidae, Channidae, Nandidae, Osphronemidae, Bagridae, Clariidae, Heteropneustidae, Mastacembelidae, Synbranchidae and Tetrodontidae. The present study shows that Cyprinidae is the most dominant family with 13 number of species contributing about 33.33% of the 16 recorded family followed by Channidae (10.27%). The study also reveals that the Panishala Beel is diverse in its fish composition.

Keywords: beel, ichthyospecies, IUCN

1. Introduction

Indian subcontinent is rich in inland water resources. India has extensive freshwater wetlands, reasonably known as Tals, Beels, Mauns, Chauri, Pats and Jheels situated all over the country. These natural resources are the integral part of the river complex and as a result of diversions in river or its course for strengthens the embankments for flood control, many of these aquatic bodies are permanently disconnected with the parent river (thus demarcated closed beels), while some of them still maintain their connection (open beels). It is important to have an adequate knowledge of the constituent of biota especially for conservation and management of the beels. Fishes have vital importance in the aquatic system. Fishes are the major nutritious food source for certain section of human population. Different fishes have different nutritional value because of their various habitats and food selection. Fishes play an important role, as they are not only useful for food and recreation, but also act as a tool for biological control by feeding upon the planktonic population and aquatic vegetation in any aquatic ecosystem. During literature survey, though we encountered a number of investigations by different workers like Dey *et al.* (2015a) ^[10], Dey *et al.* (2015b) ^[11], Das (2015) ^[5], Debnath (2015) ^[7] on Ichthyofauna in different water bodies of Cooch Behar district

of West Bengal but studies on the beels of Cooch Behar district is very scanty. So far, there is only report of Das *et al.* (2013) ^[6] on the 'Rasik Beel' of Cooch Behar. Thus, keeping this in mind the present study was designed to document the scientific information with respect to the taxonomic position, local names, conservation status and economic importance of fish species present in the Panishala Beel in Cooch Behar district of West Bengal.

2. Materials and Methods

2.1 Study site (Fig 1)

The present study was carried out in a natural wetland. It is an offshoot from river *Torsa* which in course of time got disconnected from the river and persists as an impounding water body, presently known as 'beel'. This site is named "Panishala Beel" and is situated under the administrative jurisdiction of *Panishala gram panchayet* of the district Cooch Behar. This study site (26° 27' 89'' N 89° 52' 53'' E) is situated adjacent to the Dinhat subdivision of Cooch Behar district but is 12 kilometer away from Cooch Behar town. It receives and stores mainly the rain water as well as run-off water from the adjacent land area and at present is mainly used for pisciculture by the local peoples.

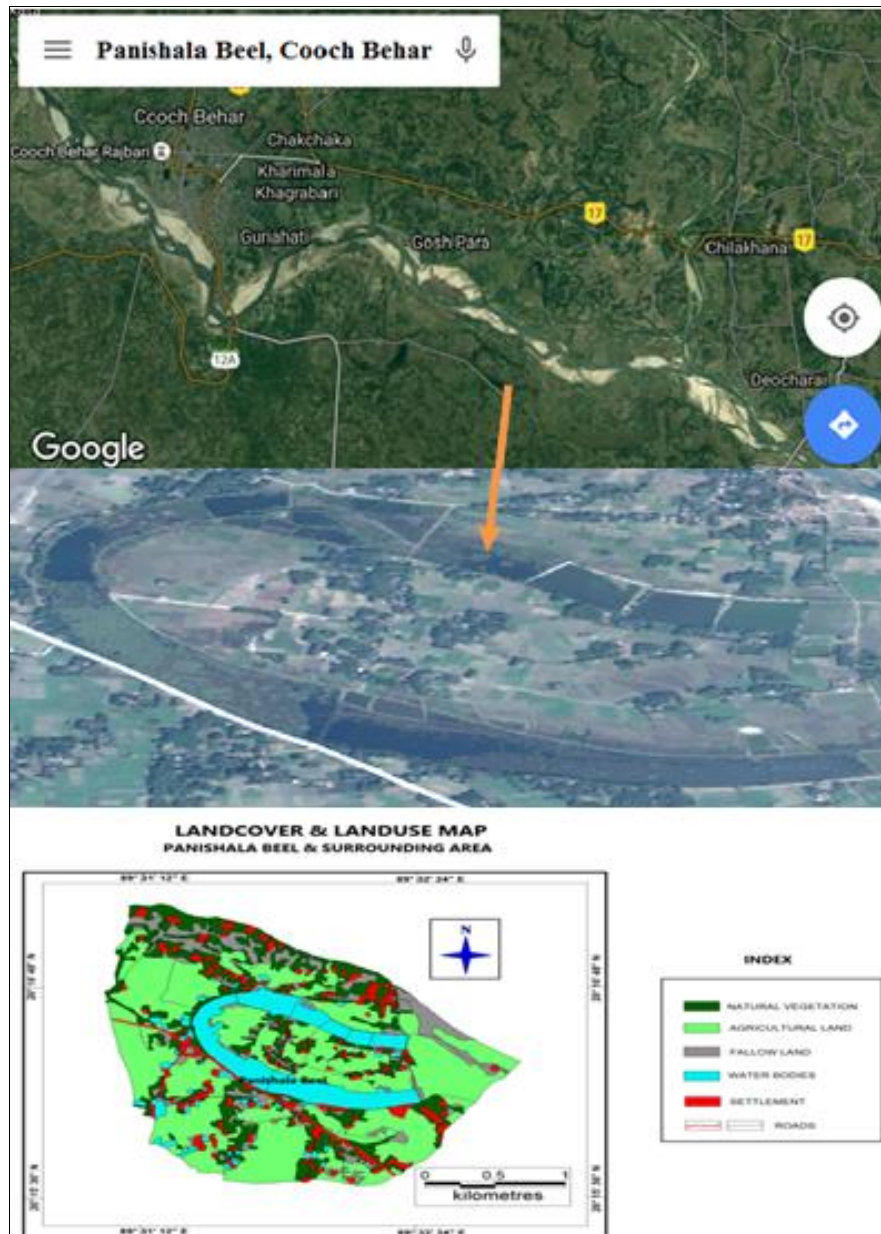


Fig 1: Satellite image and map of the study site (*Panishala Beel*).

2.2 Sample collection

Fishes were collected from the study site with the help of local expert fishermen using different types of conventional fishing gears including nets.

2.3 Identification

The fishes captured during the sampling location were identified by consulting the literatures like Talwar and Jhingran (1991) and (1999) [18]. For valid scientific name Fishbase website are consulted and to evaluate conservation

status and trends IUCN websites are surfed.

2.4 Data representation

Some graphical representations like bar diagram, pie chart etc. are prepared using Microsoft excel (Version Windows 2007).

3. Result and Discussion

3.1 Summary of general observation (Table 1 and Plate 1)

A total of 39 species belonging to 28 genera under 16 families from 8 orders was documented during the study period.

Table 1: Summary of fish fauna recorded from Panishala Beel of Coochbehar district of West Bengal, India.

Order	Family	Fish Species / Scientific Name of Fishes	Local Names	IUCN Status (ver 3.1, 2015)	IUCN Trend	Economic Importance	Food Habit
Beloniformes	Belontiidae	<i>Xenentodon cancila</i> (Hamilton, 1822)	Khata/ Kankley/ Kakhila	LC	U	O	C
Cypriniformes	Cyprinidae	<i>Amblypharyngodon mola</i> (Hamilton, 1822)	Mola/ Mourla	LC	S	F/O	H
		<i>Bengala elanga</i> (Hamilton, 1822)	Darika/ Darkina	NA	U	O	C
		<i>Rasbora daniconius</i> (Hamilton, 1822)	Darkina / Dadhika	LC	U	F/O	O
		<i>Devario devario</i> (Hamilton, 1822)	Chapling / Chapchata	LC	U	F/O	O
		<i>Brachydanio rerio</i> (Hamilton, 1822)	Anju / Zebra fish	NA	U	O	O
		<i>Cirrhinus cirrhosus</i> (Bloch, 1795)	Mrigal	VU	D	F	O
		<i>Catla catla</i> (Hamilton, 1822)	Katla	NA	U	F	H
		<i>Labeo rohita</i> (Hamilton, 1822)	Rui	LC	U	F	H
		<i>Labeo bata</i> (Hamilton, 1822)	Bata	LC	U	F	H
		<i>Puntius sophore</i> (Hamilton, 1822)	Punti (Deshi/Jat)	LC	U	O	C
	<i>Puntius conchonius</i> (Hamilton, 1822)	Kanchan Puthi	LC	U	F/O	O	
	<i>Puntius phutunio</i> (Hamilton, 1822)	Spottedsail barb / Phutuni Puti	LC	U	O	O	
	<i>Securicula gora</i> (Hamilton, 1822)	Chala/ Chela	LC	U	O	C	
Cobitidae	<i>Lepidocephalichthys guntea</i> (Hamilton, 1822)	Poia / Poa	LC	U	F/O	H	
	<i>Botia dario</i> (Hamilton, 1822)	Botya / Bou Mach	LC	U	F/O	H	
	<i>Botia lohachata</i> (Chaudhuri, 1912)	Ghutur Poa / Baghlata	NA	U	F/O	H	
Cyprinodontiformes	Aplocheilidae	<i>Aplocheilus panchax</i> (Hamilton, 1822)	Te-chokha	LC	U	O	O
Osteoglossiformes	Notopteridae	<i>Notopterus notopterus</i> (Pallas, 1769)	Pholi/ Foli	LC	U	F	C
Perciformes	Ambassidae	<i>Pseudambassis ranga</i> (Hamilton, 1822)	Chanda	LC	S	O	C
		<i>Pseudambassis baculis</i> (Hamilton, 1822)	Chanda	LC	D	O	C
		<i>Chanda nama</i> (Hamilton, 1822)	Nama Chanda	LC	D	O	C
	Anabantidae	<i>Anabas testudineus</i> (Bloch, 1792)	Koi	DD	U	F	C
		Channidae	<i>Channa punctata</i> (Bloch, 1793)	Shati	LC	U	F
	<i>Channa gachua</i> (Hamilton, 1822)		Chang	LC	U	F/O	C
	<i>Channa striata</i> (Bloch, 1793)		Shol	LC	U	F/O	C
	<i>Channa marulius</i> (Hamilton, 1822)		Shal	LC	U	F/O	C
	Nandidae	<i>Nandus nandus</i> (Hamilton, 1822)	Bheda/ Meni	LC	U	F/O	O
		<i>Badis badis</i> (Hamilton, 1822)	Napit Mach / Bot Koi	LC	U	O	O
Osphronemidae	<i>Trichogaster fasciatus</i> (Bloch & Schneider, 1801)	Khalisha/ Kholsa	NA	U	O	C	
	<i>Trichogaster labiosa</i> (Day, 1877)	Ranga-kholisha / Kholsa	NA	U	O	C	
	<i>Trichogaster chuna</i> (Hamilton, 1822)	Chuna kholisha (Dhutra)	LC	U	O	C	
Siluriformes	Bagridae	<i>Mystus vittatus</i> (Bloch, 1794)	Tengra	LC	D	F/O	C
	Clariidae	<i>Clarias batrachus</i> (Linnaeus, 1758)	Magur	LC	U	F	C
	Heteropneustidae	<i>Heteropneustes fossilis</i> (Bloch, 1794)	Singhi	LC	S	F	O
Synbranchiformes	Mastacembelidae	<i>Macrognathus pancalus</i> (Hamilton, 1822)	Gota/ Pankal	LC	U	F/O	C
		<i>Macrognathus aculeatus</i> (Bloch, 1786)	Guchi / Gota	NA	U	F/O	C
	Synbranchidae	<i>Monopterusuchia</i> (Hamilton, 1822)	Kuchia	LC	U	F	C
Tetraodontiformes	Tetraodontidae	<i>Tetraodon cutcutia</i> (Hamilton, 1822)	Tepa / Tayapa	LC	U	O	C

IUCN Status: NA = Not Assessed, LC = Least Concern, NT = Near Threatened, VU = Vulnerable, DD = Data Deficient

IUCN Trend: U = Unknown, S = Stable, D = Decreasing

Economic Importance: F = Food fish, O = Ornamental fish

Food Habit: O = Omnivorous, C = Carnivorous, H = Herbivorous

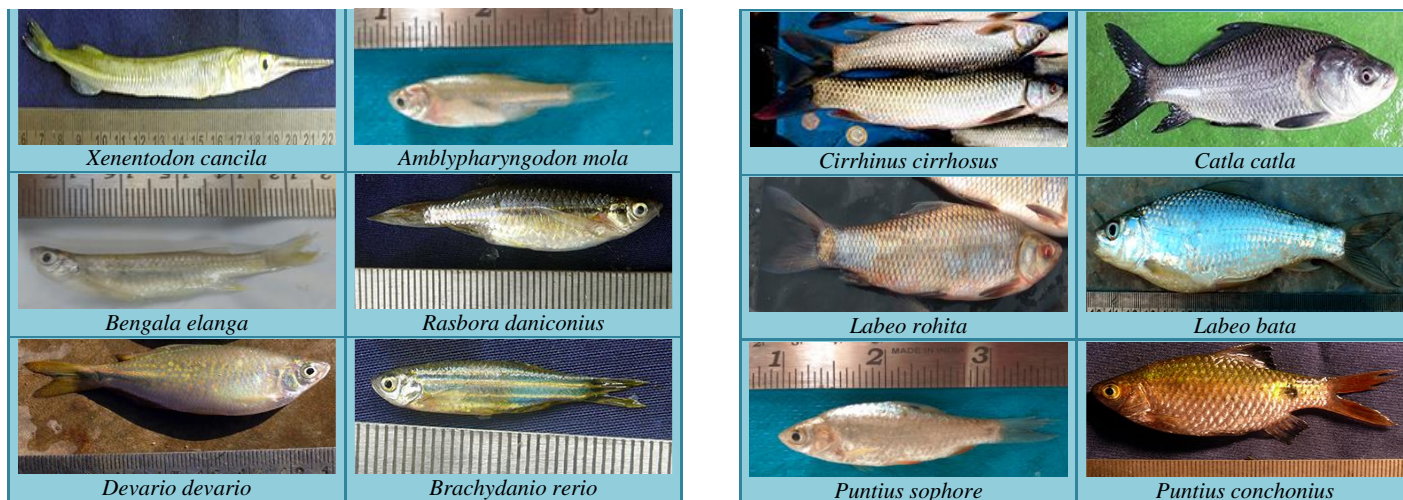




Plate 1: Photographs of the recorded specimens.

3.2 Summary on taxonomic composition

Analysis of the taxonomic composition of the fish fauna reveals that, among the recorded 16 families, Cyprinidae is the dominant family with thirteen representatives. This is followed by Channidae family with its four species. The next dominance is shown by both Ambassidae, Cobitidae and Osphronemidae with three species each.

Table 2: Contribution of different order and families

Orders	Families	Number of species	Percentage (%)
Beloniformes	Belonidae	01	2.56
	Cyprinidae	13	33.33
Cypriniformes	Cobitidae	03	7.70
	Aplocheilidae	01	2.56
Cyprinodontiformes	Aplocheilidae	01	2.56
Osteoglossiformes	Notopteridae	01	2.56
	Ambassidae	03	7.70
Perciformes	Anabantidae	01	2.56
	Channidae	04	10.27
	Nandidae	02	5.13
	Osphronemidae	03	7.70
Siluriformes	Bagridae	01	2.56
	Clariidae	01	2.56
	Heteropneustidae	01	2.56
Synbranchiformes	Mastacembelidae	02	5.13
	Synbranchidae	01	2.56
Tetraodontiformes	Tetraodontidae	01	2.56

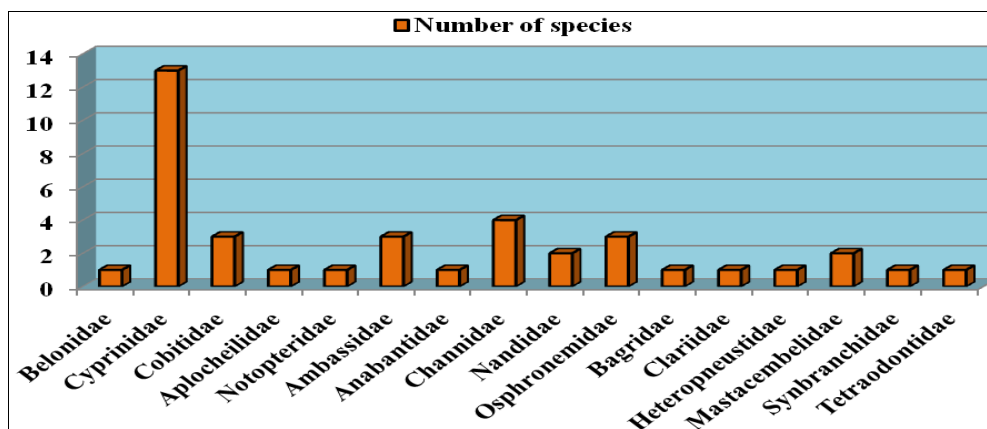


Fig 2: Family wise distribution of fish species at Panishala Beel.

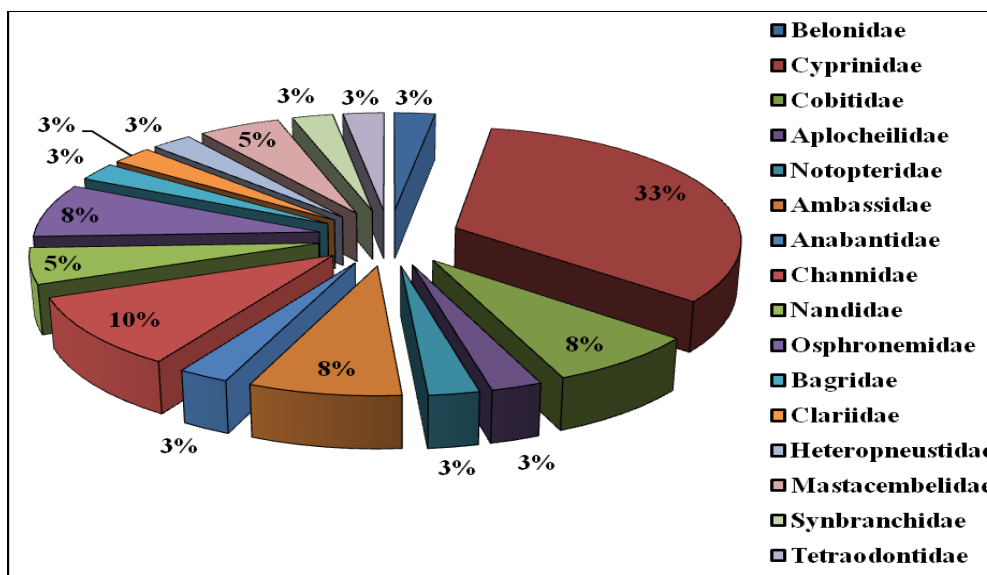


Fig 3: Family wise contribution of fish species at Panishala Beel (in per cent).

3.3 Summary on threat status and population trend: The knowledge of ichthyofaunal composition, their present threat status, role in ecosystem and human ssseconomy are prerequisites for adopting the proper conservation strategies of fish fauna. After analyzing the data, it is observed that one ‘vulnerable’ (VU) species (*Cirrhinus cirrhosus*), one ‘data deficient’ (DD) species (*Anabas testudineus*) and 30 ‘least concern’ (LC) species are recorded from the *Panishala Beel*. Surprisingly, IUCN ‘not assessed’ (NA) seven species (*Bengala elanga*, *Brachydanio rerio*, *Catla catla*, *Botia lohachata*, *Trichogaster fasciatus*, *Trichogaster labiosa* and *Macrognathus aculeatus*) of this list. Regarding trend of the population, as revealed from IUCN data it is noted that only three species of the list is stable (*Amblypharyngodon mola*, *Pseudambassis ranga* and *Heteropneustes fossilis*), population of four species is decreasing (*Cirrhinus cirrhosus*, *Pseudambassis baculis*, *Chanda nama*, *Mystus vittatus*), but other 32 species bear unknown population trend. There might be no data or no information of population trend among these 32 species to the IUCN. The cause of such threatening and population trend may be due to habitat loss, habitat degradation, over exploitation, pollution and unscientific capture technology.

Table 3: Conservation status of the Ichthyospecies at Panishala Beel as per IUCN.

IUCN Status (ver 3.1, 2015)	Number of species	Percentage (%)
Vulnerable (VU)	01	2.56
Least Concern (LC)	30	76.92
Data Deficient (DD)	01	2.56
Not Assessed (NA)	07	17.96

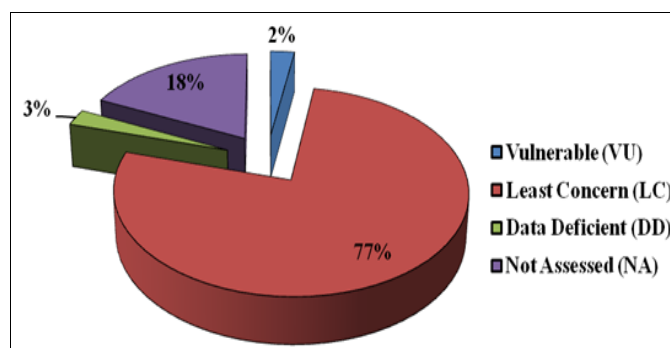


Fig 4: Conservation status of ichthyofauna at Panishala Beel (in percentage) as per IUCN.

Table 4: Population trend of fish species of Panishala Beel as per IUCN.

IUCN Population Trend	Number of species	Percentage (%)
Stable (S)	03	7.69
Decreasing (D)	04	10.26
Unknown (U)	32	82.05

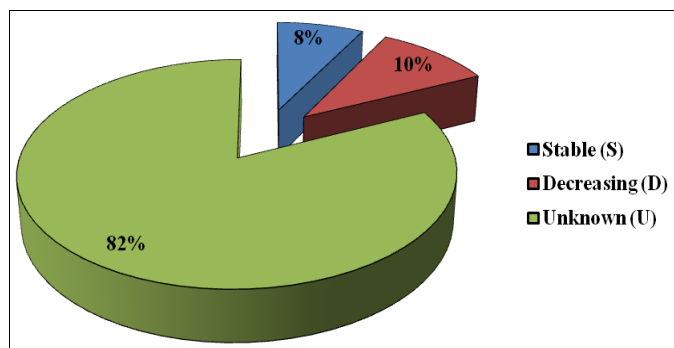


Fig 5: Percentage values of the population trend of fish fauna of Panishala Beel (IUCN).

3.4 Summary on economic importance and food habit:

Among the all collected fish specimens it is observed that out of recorded 39 species fourteen species have food value as well as ornamental value, ten species have only food value and the rest fifteen species have only ornamental value. Thus, these all species are commercially very important. By the investigation on food habit, it is revealed that 22 fish species are carnivorous, seven species are herbivorous and remaining ten species are omnivorous in their food habit.

Table 5: Economic importance of the ichthyofauna of Panishala Beel

Economic Importance	Number of species	Percentage (%)
Food fish (F)	10	25.64
Ornamental fish (O)	15	38.46
Food fish / Ornamental fish (F/O)	14	35.90

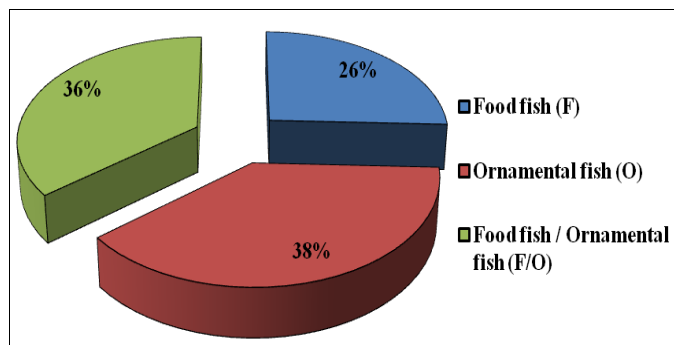


Fig 6: Percentage pie of economic importance of fish fauna at Panishala Beel.

Table 6: Showing food habit categories of fish species at Panishala Beel.

Food Habit	Number of species	Percentage (%)
Carnivorous (C)	22	56.41
Herbivorous (H)	07	17.95
Omnivorous (O)	10	25.64

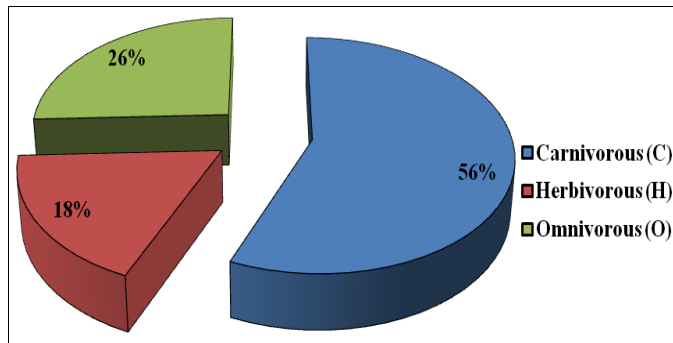


Fig 7: Percentage pie of food habit of ichthyospecies at Panishala Beel.

The Beels are considered as biologically sensitive habitats as they play a vital role in the restitution of fish populations in the riverine ecosystems and provide nursery grounds for commercially important fishes. They form an important fishery resource in the northern and north-eastern states of India. Our present study corroborated with the studies of other researchers like Dey (1981) [9], Lahon (1983) [15], Goswami (1985) [12], Kar and Dey (1993) [14], Agarwala (1996) [1], Sarma *et al.* (2012) [16] and Saud *et al.* (2012) [17], where they also found a variety of ichthyospecies in each Beel during their study. Present study reveals that in the Panishala Beel, Cyprinidae family stands as the most dominant family which is also reported by earlier workers like Chakravartty *et al.* (2012) [3], Deka and Dutta (2013) [8], Bordoloi and Hazarika (2015) [2], Chhetry and Deka (2016) [6] from different Beels they studied.

4. Conclusion

Studied wetland, the Panishala Beel, sustain 39 valuable fish species belonging to 28 genera under 16 families from 8 orders. Cyprinidae is found the most dominant family with thirteen representative species. Among the recorded fish species one ‘vulnerable’, 30 ‘least Concern’, one ‘data deficient’ and seven ‘not assessed’ species are marked by IUCN. On the view point of population trend, four species with decreasing, three species with stable and other 32 species with unknown population trend are noticed. Beside this, all fish species are commercially very important. These all reflects the need to adopt some conservation strategies to protect the variety of fish species of Panishala Beel.

6. References

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