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Ichthyofaunal diversity of era kopili beel of karbi anglong district of Assam, India

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Abstract
The study relates to the ichthyofaunal resource of Era Kopili Beel of Karbi Anglong District, Assam, India. A total of 47 number of fish species including 4 exotic fish species belonging to 33 genera under 18 families from 6 orders is recorded from the present study. Among the recorded fish species no species is recorded as vulnerable, 1 species is data deficient, 1 species is endangered, 3 species is lower risk-near threatened, 38 species are lower risk-least concern and other 4 species are not evaluated. The different families recorded are Belonidae, Cyprinidae, Cobitidae, Badidae, Ambassidae, Anabantidae, Channidae, Gobiidae, Osphronemidae, Nandidae, Bagridae, Clariidae, Heteropneustidae, Schilbeidae, Siluridae, Synbranchidae, Mastacembelidae and Notopteridae. The taxonomic study shows that Cyprinidae is the most dominant family with 17 number of species contributing about 36.17% of the 18 recorded family from the present study followed by Channidae (8.51%). The study also reveals that the Era Kopili Beel is rich in fish diversity.

Keywords: Ichthyofaunal diversity, Era Kopili Beel, Karbi Anglong District

1. Introduction
The N.E. region of India is blessed and glorified with excessive and varied type of water resources in the form of rivers (19,150 Km), reservoirs (23,792 ha); beels, lakes and swamps (143,740 ha); ponds and mini barrage (40,808 ha) and low laying paddy cum fish culture systems (2,780 ha) (Mahanta *et al.* 2003) [12]. This region of the country is very rich in fish diversity and so far 267 fresh water fish species belonging to 114 genera under 38 families and 10 orders have been reported from the region (Mahanta *et al.* 2003) [12], which is 33.13 % (approximately) of the total freshwater fishes of India (Sen, 2000) [15].
Fish is an important food resource in Assam and there are lots of flood-plain wetlands exhibiting enormous diversity of fish fauna supported by the subtropical climate, favourable ecological and geographical condition with about 3.9 lakh hector of water area with rich aquatic biodiversity having largest number of fish species (217), followed by Arunachal Pradesh (167), Meghalaya (165), Tripura (134), Manipur (121), Nagaland (68), Sikkim (52) and Mizoram (48) (Mahanta *et al.* 2003) [12]. The rich fish diversity in Assam is bestowed with many flood plain wetlands from two major river systems namely the Brahmaputra and the Barak river system. The wetlands and lakes are major fishery resources of Assam contributing to about 25% of the fish production (Chakravartty *et al*., 2012) [4]. The fishes provide nutrition as well as generate economy. The present study is therefore, an attempt to investigate the ichthyofaunal diversity of Era Kopili Beel (wetland) of Karbi Anglong District of Assam, India.

2. Materials and Method
2.1. Study area
The Era Kopili Beel which is located near Tumpreng in the district of Karbi Anglong of Assam is highly rich in Piscean and Avian fauna. The beel is formed as the river Kopili changed its original course to form a new one thus creating a large marshy land so named as '*ERA* (left out) KOPILI BEEL'. This beel is the main source for the local fisherman to maintain their livelihood. The present work was based on the studies carried out for a period of 12 months, commencing from May, 2015 to April, 2016.

2.2. Survey sites
During the study, two major fish landing sites Komorakata Ghat and Kopili Ghat of the beel were surveyed and different fish species were collected from the local fisher. Fishes caught for personal consumption were also recorded.

2.3. Data collected from local fisherman
Occurrence of the fish species other than collected directly from the two sites (Komorakata Ghat and Kopili Ghat) were recorded from local fisher by interviewing them with the help of questionnaires.

2.4. Collection, photography and identification of fish
Fishes were collected in live condition and photographs were taken by digital camera placing them in a clean paper with a scale along the length of the specimen. The collected fishes were preserved in 10% formaldehyde solution for identification. The specimens were identified as per Talwar and Jhingran (1991) [16]; Jayaram (1999) [9]; Vishwanath (2002).

3 Results
A total of 47 species of fishes have been recorded from the study site belonging to 33 genera, 18 families and 6 orders (Table-1) with IUCN status.

Table 1: Fish fauna of Era Kapili Beel with their IUCN status are given below

Sl. No.	Order	Family	Species	Local Name	Iucn Status
1	Beloniformes	Belonidae	Xenentodon cancila (Ham.-Buch.)	Kokila	LRlc
2	Cypriniformes	Cyprinidae	Gibelion catla (Ham.-Buch.)	Bhokua	LRlc
3			Pethia ticto (Hamilton)	Kani puthi	LRlc
4			Esomus danricus (Hamilton)	Dorikona	LRlc
5			Cirrhinus reba (Ham.-Buch.)	Lachim	LRlc
6			Labeo bata (Ham.-Buch.)	Bhangone	LRlc
7			Labeo rohita (Ham.-Buch.)	Rou	LRlc
8			Labeo gonius (Ham.-Buch.)	Kurhi	LRlc
9			Osteobrama cotio (Ham.-Buch.)	Hato	LRlc
10			Labeo calbasu (Hamilton)	Bahu	LRlc
11			Puntius sophore (Ham.-Buch.)	Bar Puthi	LRlc
12			Puntius javanicus (Bleeker)	Java puthi	NE
13			Amblypharyngodon mola (Ham-Buch)	Muwa	LRlc
14			Systomus sarana (Ham.-Buch.)	Seni Puthi	LRlc
15			Cirrhinus mrigala (Ham.-Buch.)	Mirika	LRlc
16			Ctenopharyngodon idella (Valenciennes)	Grass Carp	NE
17			Hypophthalmichthys molitrix (Valenciennes)	Silver carp	NE
18			Cyprinus carpio (Linnaeus)	Common carp	NE
19		Cobitidae	Lepidocephalichthys guntea (Ham- Buch)	Batia	LRlc
20	Perciformes	Ambassidae	Chanda nama (Ham.-Buch.)	Chanda	LRlc
21			Parambassis baculis (Hamilton)	Chanda	LRlc
22			Parambassis ranga (Hamilton)	Chanda	LRlc
23		Anabantidae	Anabas testudineus (Bloch)	Kawoi	DD
24		Nandidae	Nandus nandus (Hamilton)	Gadgadi	LRlc
25		Channidae	Channa punctatus (Bloch)	Goroi	LRlc
26			Channa gachua (Ham.-Buch.)	Cheng	LRlc
27			Channa striata (Bloch)	Sol	LRlc
28			Channa marulius (Hamilton)	Sal	LRlc
29		Gobiidae	Glossogobius giuris (Ham.-Buch.)	Patimutura	LRnt
30		Osphronemidae	Trichogaster fasciata (Schneider)	Kholihona	LRlc
31			Trichogaster chuna (Hamilton)	Vesseli	LRlc
32			Trichogaster lalius (Ham.-Buch.)	Kholihona	LRlc
33		Badidae	Badis badis (Hamilton)	Doom Vesseli	LRlc
34	Siluriformes	Bagridae	Mystus cavasius (Ham.-Buch.)	Bor Singora	LRlc
35			Mystus tengara (Ham.-Buch.)	Singora	LRlc
36			Sperata seenghala (Sykes)	Ari	LRlc
37		Clariidae	Clarias magur (Linnaeus)	Magur	EN
38		Siluridae	Ompok pabda (Hamilton)	Pavo	LRnt
39			Wallago attu (Schneider)	Barali	LRlc
40		Heteropneustidae	Heteropneustes fossilis (Bloch)	Singhi	LRlc
41		Schilbeidae	Pachypterus atherinoides (Bloch)	Bordowa	LRlc
42	Synbranchiformes	Synbranchidae	Monopterus cuchia (Ham.-Buch.)	Kuchia	LRlc
43		Mastacembelidae	Mastacembelus armatus (Lacepede)	Bami/Gosi	LRlc
44			Macrognathus aral (Bloch & Schneider)	Turi	LRlc
45			Macrognathus pancalus (Ham.-Buch.)	Turi	LRlc
46	Osteoglossiformes	Notopteridae	Notopterus notopterus (Ham.-Buch.)	Kandhuli	LRlc
47			Chitala chitala (Pallas)	Chital	LRnt

LRnt= Lower risk near threatened,
LRlc=Lower risk least concern,
VU= Vulnerable,
DD=Data deficient,
NE= Not Evaluated,
EN-Endangered

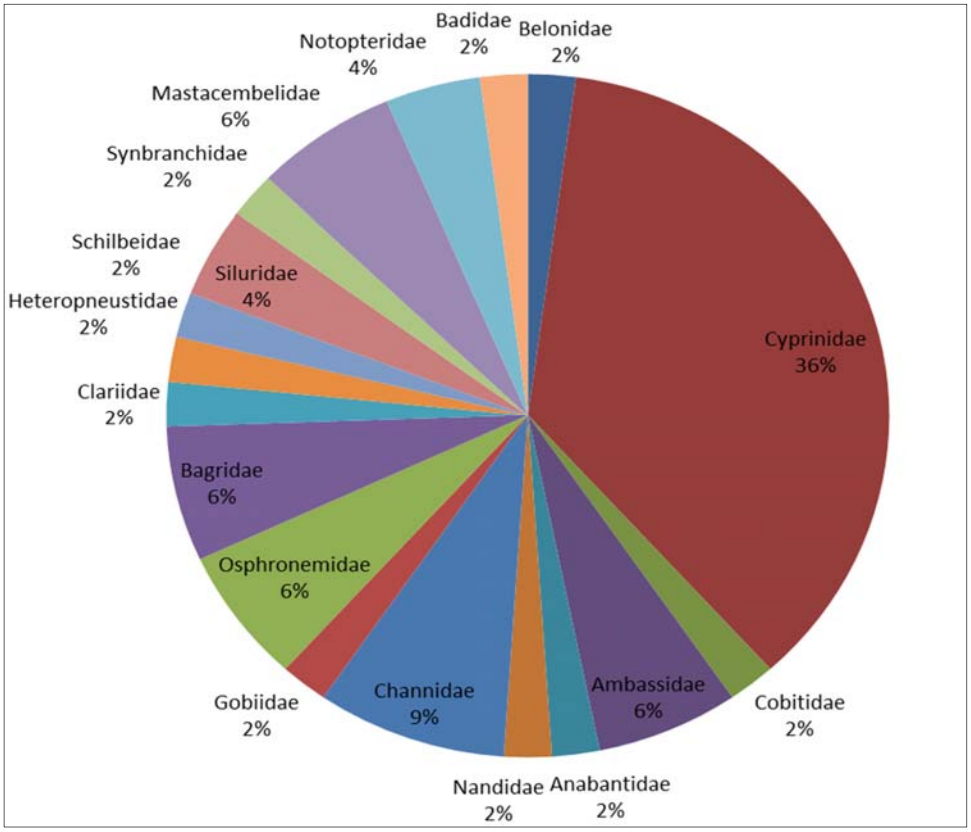


Fig 1: Family wise distribution of fish species

Among the 47 fish species recorded from Era Kopili Beel belonging to 33 genera and 18 families, it has been observed that Cyprinidae family was the most dominant (36.17%), which includes 17 species followed by Channidae family with 4 species holding 8.51% share. The third highest dominancy is shared by Ambassidae, Bagridae, Osphronemidae and Mastacembelidae comprising 6.38%. The next dominancy is shown by Siluridae and Notopteridae which comprise 4.26% and the rest of the families (Table-1) were observed to be the least dominating with 2.13 % each.

The conservation status of the recorded fishes have been classified into five categories viz., LRnt= Lower risk near threatened; LRlc=Lower risk least concern, VU= Vulnerable; DD=Data deficient; NE= Not Evaluated; EN-Endangered of which no species is recorded as vulnerable, 1 species is endangered, 3 species is lower risk-near threatened, 1 species is Data deficient, 38 species are lower risk-least concern and other 4 species are not evaluated.

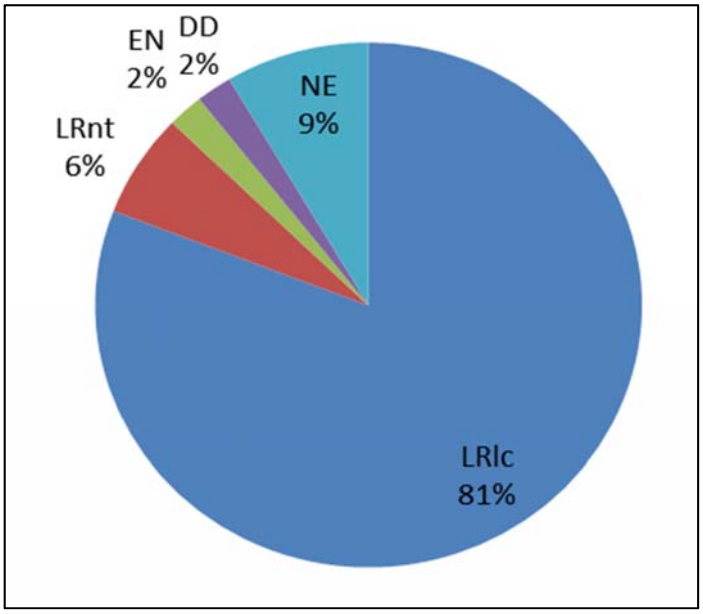


Fig 2: Percentage distribution of conservation status of recorded fish species

Labeo gonius

Pethia ticto

Labeo bata

Cirrhinus mrigala

Puntius javanicus

Badis badis

Puntius sophore

Trichogaster lalius

Ompok pabda

Clarius magur

Wallago attu

Heteropneustes fossilis

Sperata seenghala

Channa punctatus

Mystus tengara

Channa striata

Channa marulius

Xenentodon cancila

Channa gachua

Parambassis baculis

Lepidocephalichthys guntea

Chanda nama

Glossogobius giuris

Gibelion catla

Notopterus notopterus

Ctenopharyngodon idella

Chitala chitala

Cyprinus carpio

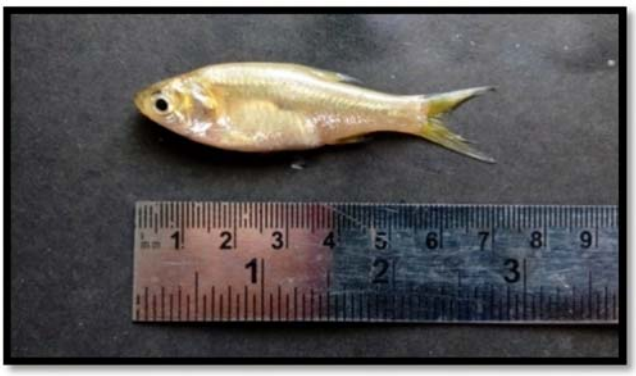
Macrognathus pancalus

Hypophthalmichthys molitrix

Macrognathus aral

Labeo calbasu

Nandus nandus



Amblypharyngodon mola

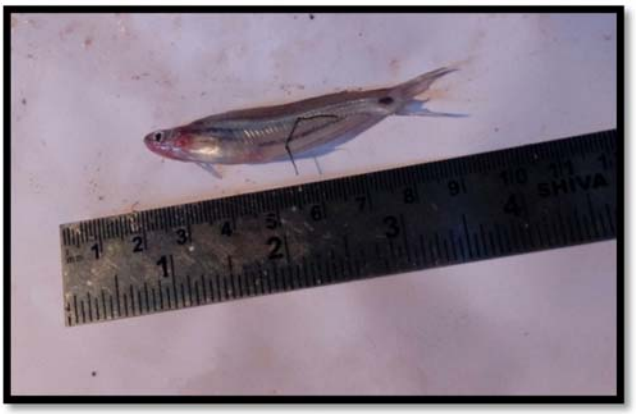
Anabas testudineus

Labeo rohita

Esomus danricus

Trichogaster fasciata

Osteobrama cotio



Pachypterus atherinoides

During the study period some of the fishes although not recorded by photograph but were found in the studied beel. The information about their occurrence was collected from the local fishermen of the Beel. The fishes include *Cirrhinus reba, Systomus sarana, Parambassis ranga, Trichogaster chuna, Mystus cavasius, Monopterus cuchia, Mastacembelus armatus.*

4. Discussion

Beels, the prime fishery resources in Assam, are highly productive which can convert the solar energy into organic matter in presence of rich nutrients available from natural sources. In Assam, there have been three primary groups of people involved in organized fishing in the beels. These are 1.Those that catches fish for their own daily consumption. 2. Those who belonging to the fisher community and fishing is their livelihood. 3. Rural Entrepreneurs (Leaseholders).

However, the present study reveals rich ichthyofaunal diversity as forty seven numbers of species of fishes have been recorded with some ornamental species. The rich fish diversity of the beels of lower Assam has also been recorded from Chanddubi (57 species) (Goswami, 1985) [7], Dora (62 species) (Lahon, 1983) [11], Deepor (41 species) (Dey, 1981) [6], Tamranga beel (63 species) (Agarwala, 1996) and Urpod (60 species) (Saud *et al.*, 2012). However, recent study done by Goswami and Kalita, 2012 [8]. on Deepor beel reveals that the number of fish species increase to 54. Rich ichthyofaunal diversity in the beels of Barak valley, Assam has been reported by Kar and Dey (1993) [10] from Sone beel (70 species). Acharjee (1997) [1] has also reported (56 species) in three beels of Kamrup district and Sarma *et al.*, 2012 in Goronga Beel of Morigaon district (77 species) [13].

The exotic species in the beels are C*yprinus carpio, Ctenopharyngodon idella, Hypophthalmichthys molitrix and Puntius javanicus* which are common in most wetlands (beels) of Assam. The commercially important fish species found in the wetland are *Labeo rohita, Labeo gonius, Gibelion catla, Cirrhinus mrigala, Notopterus notopterus,Chitala chitala, Wallago attu, Channa marulius, Channa striatus, Cirrhinus reba, Heteropneustes fossilis, Clarias magur, Ompok pabda, Anabas testudineus, Mystus tengra* etc.

Cyprinidae was the most dominant family recorded in the present study which is also reported by earlier workers from Assam (Chakravartty *et al.*, 2012; Deka and Dutta, 2013; Bordoloi and Hazarika, 2015) [4, 5, 3].

The ecosystem of Era Kopili Beel supports the habitat of variety of fish species with ornamental ones. This beel is playing an important role for the livelihood by producing animal protein for the local people.

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