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Research Article

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Inventory of indigenous ornamental fishes commonly found in Barak valley fish markets, Assam, India

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ABSTRACT

The river Barak flows along with plentiful tributaries through its different districts of Barak valley along with numerous lotic and lentic water bodies and comprises of various fishery resources which offers wonderful habitat for many ornamental fishes. During the preliminary investigation for the duration of December 2012-November 2013, 66 species of ornamental fishes were recorded from the local fish markets. Fishes belonging to 48 genera, 21 families and 10 orders were recorded. Of these, family Cyprinidae was highest represented with 19 species followed by the family Cobitidae (5 species each) and Schilbeidae (4 species each), Clupidae, Bagridae, Mastacembelidae and Ambassidae, Osphronemidae, Channidae (3 species each) followed by Anabantidae, Siluridae, Sisoridae, (2 species each) others represented by single species. The study revealed that 8% were nearly threatened 73% were least concerned 4% were data deficient 14% were Not Evaluated and 1% is vulnerable according to IUCN category and according to CAMP status 3% were Endangered, 29% were Lower Risk- Near Threatened, 27% were Vulnerable, 8% were Lower risk-Least concerned, 3% were Data Deficient, 30% Not evaluated.

***Key words**: Ornamental fish, conservation, Barak valley, Assam*

INTRODUCTION

Ornamental fishes are characterized by a wide variety of colours and colour patterns. Generally they are small attractive fishes and sometimes show peculiar movement while accepting their food. They are kept as pets in aquarium or garden pool for aesthetic value. Barak valley is richly endowed with various flora and fauna. Barak valley is named after the large alluvial river Barak, covering three South Assam districts namely, Cachar, Karimganj and Hailakandi. The low-lying hill of Barak valley discloses an elite landscape of ridge and valley[18]. Presently over Rs. 150 million is India's overall trade for ornamental fishes and lion's share is being added from North Eastern region[5]. Barak valley comprises of many river tributaries and wetlands as of which the fish markets are flooded with diverse fishes. For freshwater fish biodiversity Northeastern region of India is one of the hot spots in the world[12]. Among the market surveys for indigenous ornamental fish 51 fish species have been reported from Kolkata[9].

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Many studies have been carried out in different parts of Assam. 32 ornamental fish species from Jorhat, Sibsagar, Dibrugarh and Tinsukia districts of upper Assam have been reported by Pandey *et al.*[20], 87 ornamental fish species have been recorded from Assam by Bhattacharjya *et al.*[2], further Bhattacharjya *et al.*[3] recorded 150 fish species with potential ornamental value. 62 ornamental fish species have been recorded from floodplain wetlands of upper Brahmaputra basin by Das and Biswas[5] and 62 ornamental fish species have been recorded from Majuli island of Assam by Das & Bordoloi[6]. 61 ornamental fish species have been recorded from central Brahmaputra valley zone by Sarma *et al.*[21]. 62 ornamental fish species have been recorded from flood plain lakes of lower Brahmaputra basin of lower Assam[17]. 49 ornamental fish species have been reported from River Sonkosh, a tributary of the Brahmaputra River in north-west bank in the western part of Kokrajhar District of Bodoland Territorial Council[1]. A total of 81 species were studied from the the basin course of River Brahmaputra within the state Assam[8]. Although many works has been carried out in Brahmaputra valley, Barak valley is still scantily surveyed for ornamental fishes. Many Ichthyofauna diversity works has been done in Barak valley such as in various wetlands in Barak drainages[13], in rivers Barak, Jatinga and Dholeswari[10], Barak drainages[13] and in Sone Beel[14] which concludes a wide variety of fishes which also includes many ornamental fishes, but no detail survey has been conducted in the markets of the entire region on ornamental fishes. There are a number of fish markets in the region where some indigenous ornamental fishes are sold as food fishes. Along with the regular fish, fishermen bring some indigenous colourful fishes having ornamental value from different areas especially from beels and rivers. Therefore, the present study attempts to make a preliminary survey of ornamental fishes from the markets of the region to see the potential that Barak valley holds for ornamental fishes.

MATERIALS AND METHODS

The present study on ornamental fish diversity in various fish markets were done by visiting seasonally twenty fish markets of all the three districts of Barak Valley, Southern Assam namely Cachar, Karimganj and Hailaknadi. The study was done during December 2011 to June 2013. The fish specimens were collected and preserved immediately in 10% Formalin for identification. The fishes were identified using standard literature on taxonomy[16,22]. Classification was based on fishbase. Some samples were sent to (Zoological Survey of India) ZSI, Shillong for Identification confirmation. IUCN (2015) red list data and CAMP (1998) status was consulted to see the conservation status of the fishes.

RESULTS AND DISCUSSION

During the survey a total number of 66 species of ornamental fishes were recorded, belonging to 48 genera, 21 families and 10 orders (Table 1, Fig-1). Of these, family Cyprinidae was highest represented with 19 species followed by the family Cobitidae (5species each) and Schilbeidae (4species each) , Clupidae, Bagridae, Mastacembelidae and Ambassidae, Osphronemidae, Channidae (3 species each) followed by Anabantidae, Siluridae, Sisoridae, (2 species each) and Notopteridae, Opichthidae, Psylorhynchidae, Balitoridae, Clariidae, Erethistidae, Heterpneustidae, Mugilidae, Belonidae, Aplocheilidae, Sciaenidae, Badidae, Nandidae, Gobidae represented by single species (Fig-2). The ornamental fishes of Barak valley belong to the following orders- Osteoglossiformes (1%), Anguilliformes (1%), Clupeiformes (4%), Cypriniformes (39%), Siluriformes (21%), Mugiliformes (1%), Beloniformes (2%), Cyprinodontiformes (2%), Synbranchiformes (4%), Perciformes (23%) (Fig-4). The study revealed that 8% were nearly threatened 73% were least concerned 4% were data deficient 14% were Not Evaluated and 1% is vulnerable according to IUCN (Fig-4) category and according to CAMP status 3% were Endangered, 29% were Lower Risk- Near Threatened, 27% were Vulnerable, 8% were Lower risk-Least concerned, 3% were Data Deficient, 30% Not evaluated. (Fig-5). The present study yielded 8 new addtions to Barak valley not reported in earlier works[13,14,15] were recorded which includes *Gonialosa manmina, Salmophasia phulo, Danio rerio, Lepidocephalichthys berdmorei, Gagata cenia, ,Erethistes hara, Parambasis lala,* and *Anabas cobojius.* The population of *Gudusia chapra, Tenualosa ilisha, Danio rerio , Acanthocobitis botia, Botia rostrata, Mystus cavasius, Mystus vittatus , Wallago attu, Ailia coila, Chanda nama, Parambassis lala* are tending to decline (IUCN, 2015).

Table 1- List of ornamental fishes in Barak valley with local name, English name, Scientific name IUCN red list data and CAMP status

S.No.	Scientific name	Local name	Common name	Order	Family	IUCN 2015	CAMP status
1.	*Notopterus notopterus* (Pallas,1769)	Jitolmach/chitolmach	Black knife fish	Osteoglossiformes	Notopteridae	LC	LRnt
2.	*Psiodonophis boro* (Hamilton,1822)	Baim	Rice paddy eel	Anguilliformes (Actinopterygii)	Opichthidae	LC	NE
3.	*Gudusia chapra* (Hamilton,1822)	Chapila	Indian river shad	Clupeiformes	Clupidae	LC	LRlc
4.	*Gonialosa manmina* (Hamilton, 1822)	Chapila	Ganges river gizzard shad	Clupeiformes	Clupeidae	LC	VU
5.	*Tenualosa ilisha* (Hamilton, 1822)	Ilishmachh	Hilsa	Clupeiformes	Clupeidae	LC	VU
6.	*Esomus danricus* (Hamilton,1822)	Darkina	Flying barb	Cypriniformes	Cyprinidae	LC	LRlc
7.	*Amblypharyngodon mola* (Hamiton)	Mokamach	Brass fish	Cypriniformes	Cyprinidae	LC	LRlc
8.	*Puntius sophore* (Hamilton,1822)	Putimach	Spotfin swamp barb	Cypriniformes	Cyprinidae	LC	LRnt
9.	*Puntius chola* (Hamilton,1822)	Puti	Chola barb	Cypriniformes	Cyprinidae	LC	VU
10	*Pethia Conchonius* (Hamilton,1822)	Chepta Puti	Indian rosy/red barb	Cypriniformes	Cyprinidae	LC	VU
11	*Puntius sarana*	Puta	Olive bar	Cypriniformes	Cyprinidae	LC	VU
12	*Labeo bata* (Hamilton,1822)	Elong	Bata labeo	Cypriniformes	Cyprinidae	LC	LRnt
13.	*Labeo gonius* (Hamilton, 1822)	Ghonia	Kuria labeo	Cypriniformes	Cyprinidae	LC	LRnt
14.	*Labeo rohita* (Hamilton, 1822)	Rou mach	Rohu	Cypriniformes	Cyprinidae	LC	LRnt
15.	*Salmophasia phulo* (Hamilton,1822)	chela	Finscalerazorbelly minnow	Cypriniformes	Cyprinidae	LC	NE
16.	*Salmophasia bacaila* (Hamilton,1822)	Baiya chela	Large razor belly minnow	Cypriniformes	Cyprinidae	LC	LRlc
17.	*Devario annandalei* (Chaudhuri,1908)	Nodir Darkina		Cypriniformes	Cyprinidae	DD	NE
18.	*Devario devario* (Hamilton,1822)	Kashkhauri	Silver danio	Cypriniformes	Cyprinidae	LC	LRnt
19.	*Osteobrama cotio cotio* (Hamilton,1822)	Gillachagi	Diamond barb	Cypriniformes	Cyprinidae	NE	LRnt
20.	*Cirrhinus reba* (Hamilton,1822)	Kharish mach	Reba carp	Cypriniformes	Cyprinidae	LC	VU
21.	*Gymnostomus ariza* **(**Hamilton, 1807)	Mirga	Reba	Cypriniformes	Cyprinidae	NE	NE
22.	*Barilius bakeri* (Day, 1865)	Pahari puti	Malabar Baril	Cypriniformes	Cyprinidae	LC	VU
23.	*Barilius barna* (Hamilton 1822)	Pahari puti	Barna Baril	Cypriniformes	Cyprinidae	LC	LRnt
24.	*Danio rerio* (Hamilton 1822)	Anju	Zebrafish	Cypriniformes	Cyprinidae	LC	NE
25.	*Psilorhynchus balitora* (Hamilton 1822)	Gutum	Balitora minnow	Cypriniformes	Psylorhynchidae	LC	NE
26.	*Acanthocobitis botia* (Hamilton 1822)	Nodir Gutum	Leopard/striped loach	Cypriniformes	Balitoridae	LC	DD
27.	*Somileptes gongota* (Hamilton,1822)	Gutum	Moosehead loach/ Gongota loach	Cypriniformes	Cobitidae	NE	LRnt
28.	*Lepidocephalichthys berdmorei*(Blyth,1861)	Gutum	Burmese loach	Cypriniformes	Cobitidae	LC	NE
29.	*Lepidocephalichthys guntea*(Hamilton.1822)	Gutum	Guntea/panther loach	Cypriniformes	Cobitidae	LC	NE

30.	*Botia dario* (Hamilton,1822)	Rani mach	Rani/queen loach	Cypriniformes	Cobitidae	LC	NE
31.	*Botia rostrata* (Günther,1868)	Rani mach	Ladder loach/twin banded loach	Cypriniformes	Cobitidae	VU	NE
32.	*Mystus bleekeri* (Day,1877)	Tengra	Day's mystus	Siluriformes	Bagridae	LC	VU
33.	*Mystus cavasius* (Hamilton 1822)	Ghula tengra	Gangetic mystus	Siluriformes	Bagridae	LC	LRnt
34.	*Mystus vittatus* (Bloch,1797)	Tengra	Striped dwarf catfish	Siluriformes	Bagridae	LC	VU
35.	*Ompok bimaculatus* (Bloch,1794)	Pabda	Butter catfish	Siluriformes	Siluridae	NT	EN
36.	*Wallago attu* **(**Bloch & Schneider 1801)	Boal mach	Wallago	Siluriformes	Siluridae	NT	LRnt
37.	*Neotropius atherinoides* (Bloch,1794)	Laiya	Indian potasi	Siluriformes	Schilbeidae	LC	NE
38.	*Eutropiichthys vacha* (Hamilton,1822)	Bacha	Batchwavacha	Siluriformes	Schilbeidae	LC	EN
39.	*Eutropiichthys murius* (Hamilton,1822)	Loua bacha	Muriusvacha	Siluriformes	Schilbeidae	LC	LRnt
40.	*Ailia coila* (Hamilton,1822)	Baspata/lipasi	Gangetic ailia	Siluriformes	Schilbeidae	NT	VU
41.	*Gagata cenia* (Hamilton,1822)	kangot	Clown catfish	Siluriformes	Sisoridae	LC	NE
42.	*Glyptothorax striatus* (McClelland, 1842)	Singi	Hill stream catfish	Siluriformes	Sisoridae	NT	VU
43.	*Clarius batrachus (Linneaus,1758)*	Magur	Walking catfish	Siluriformes	Clariidae	LC	VU
44.	*Erethistes hara* (Hamilton,1822) *Erethistes horai* (Misra,1976)	Kawa mach	Butterfly catfish	Siluriformes	Erethistidae	LC	NE
45.	*Heteropneustes fossilis*(Bloch,1794)	Shingi	Stinging catfish	Siluriformes	Heterpneustidae	LC	VU
46.	*Sicamugil cascasia* (Hamilton,1822)	(Kharkota/bas)	Yellowtail mullet	Mugiliformes	Mugilidae	LC	VU
47.	*Xenentodon cancila* (Hamilton,1822)	Kakia	Silver needle fish	Beloniformes	Belonidae	LC	LRnt
48.	*Aplocheilius panchax* (Hamilton,1822)	Garu mach	Blue panchax	Cyprinodontiformes	Aplocheilidae	NE	DD
49.	*Macroganthus pancalus* (Hamilton,1822)	Baing	Striped spiny green eel	Synbranchiformes	Mastacembelidae	LC	LRnt
50.	*Macroganthus aral* (Blotch & Schneider,1801)	Baing	Peacock eel	Synbranchiformes	Mastacembelidae	LC	LRnt
51.	*Mastacembellus armatus* (Lacepede,1800)	Baing	Tire track spiny eel	Synbranchiformes	Mastacembelidae	NE	VU
52.	*Chanda nama* (Hamilton,1822)	Lamba chandua	Elongate glass perchlet	Perciformes	Ambassidae	LC	NE
53.	*Parambasis ranga* (Hamilton,1822)	Golchandua	Indian glassy fish	Perciformes	Ambassidae	NE	NE
54.	*Parambassis lala* (Hamilton,1822)	Chankira	Highfin glassy perchlet	Perciformes	Ambassidae	NT	NE
55.	*Johnius coitor* (Hamilton,1822)	Kuma mach	Big eyed jewfish	Perciformes	Sciaenidae	LC	NE
56.	*Badis badis* (Hamilton,1822)	Napit/kala mach	Badis	Perciformes	Badidae	LC	NE
57.	*Nandus nandus* (Hamilton,1822)	Bheramach	Leaf fish	Perciformes	Nandidae	LC	LRnt
58.	*Glossogobius giuris* (Hamilton,1822)	Baligura	Sleeper goby	Perciformes	Gobidae	LC	LRnt
59.	*Anabas cobojius*	Koi		Perciformes	Anabantidae	DD	VU

	(Hamilton,1822)						
60.	*Anabas testudineus* (Bloch)	Koi	Climbing perch	Perciformes	Anabantidae	DD	VU
61.	*Colisafasciata* (Bloch,1793)	Kholisa	Thick lipped gourami	Perciformes	Osphronemidae	NE	LRnt
62.	*Colisa lalia* (Hamilton,1822)	Petimach	Dwarf gourami	Perciformes	Osphronemidae	NE	NE
63.	*Trichlogester chuna* (Hamilton,1822)	Koilsa	honey gourami	Perciformes	Osphronemidae	LC	NE
64.	*Channa punctata* (Bloch,1793)	Cheng mach	Spotted snakehead	Perciformes	Channidae	LC	LRnt
65.	*Channa striata* (Bloch,1793)	Showl mach	Striped snakehead	Perciformes	Channidae	LC	LRlc
66.	*Channa orientalis* (Bloch & Schneider 1801)	Upolmach	Walking snakehead	Perciformes	Channidae	NE	VU

LC-Least Concerned; DD-Data Deficient; NT-Nearly Threatened; NE-Not Evaluated;VU-Vulnerable,EN-Endangered, LRlc-Lower Risk-Least Concerned, LRnt-Lower Risk-Near threatened

Fig. 1: Composition of Taxa

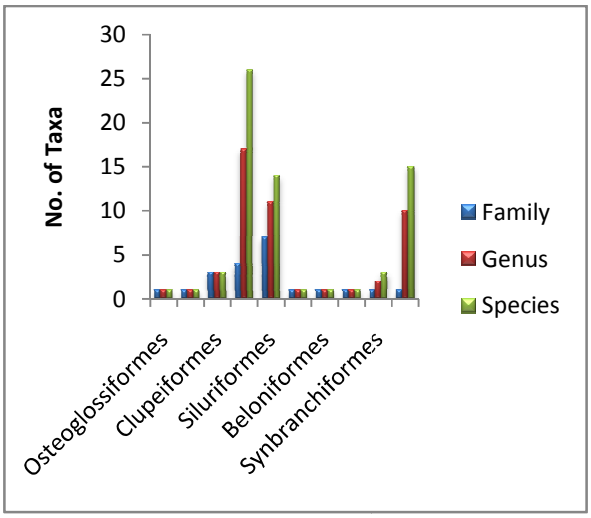

Fig. 2: Availability of ornamental Fishes in Barak Valley

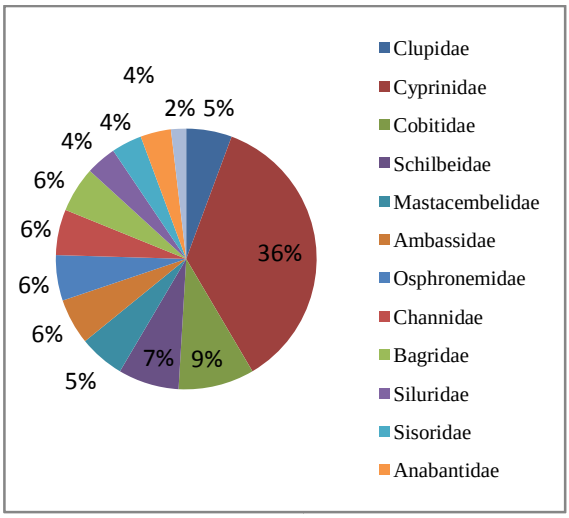

Fig. 3: Occurrence of different orders of ornamental fishes in Barak Valley

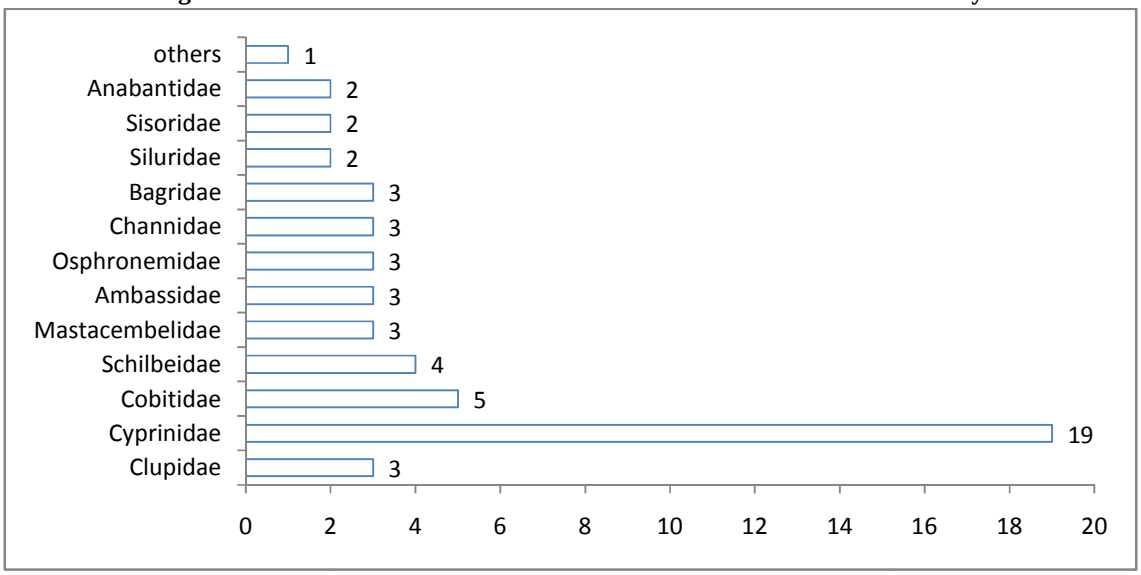

Fig. 4: Occurrence of different orders of ornamental fishes in Barak valley fish markets

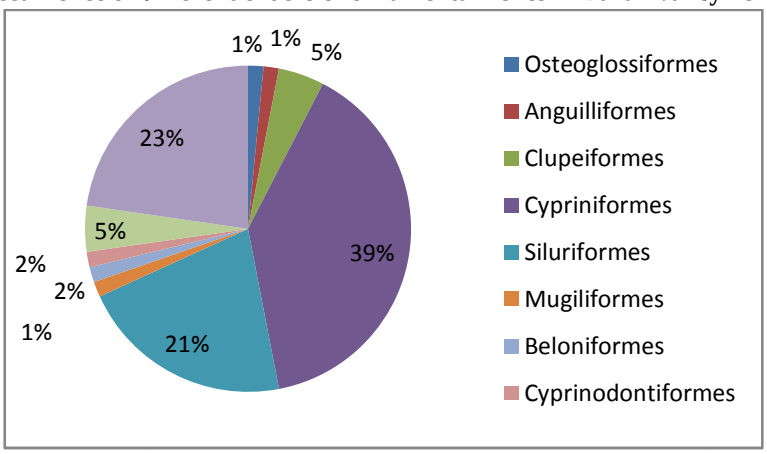

Fig. 5: IUCN category of fishes

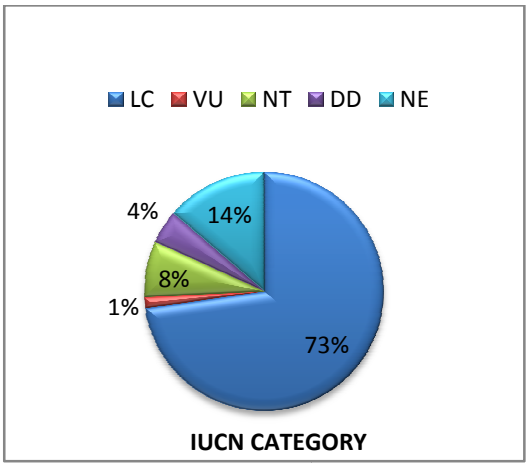

Fig. 6: CAMP status of fishes

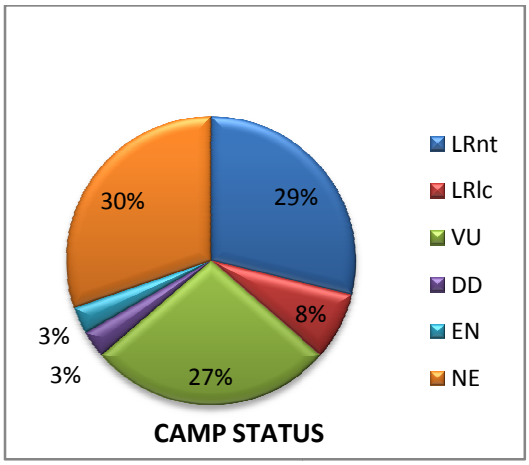

Plate1 Photographs of ornamental fishes, Barak valley

Plate1:1-28: *1-Notopterus notopterus, 2-Gudusia chapra, 3-Gonialosa manmina, 4-Esomus danricus, 5- Amblypharyngodon mola, 6- Puntius sophore, 7- Labeo rohita , 8- Salmophasia phulo , 9- Salmophasia bacaila, 10-Devario annandalei, 11-Devario devario, 12-Osteobrama cotio cotio, 13- Cirrhinus reba, 14-Danio rerio, 15- Somileptes gongota , 16- Lepidocephalichthys berdmorei, 17- Lepidocephalichthys guntea, 18-Botia dario, 19-Mystus bleekeri, 20- Mystus cavasius, 21- Mystus vittatus, 22- Ompok bimaculatus, 23-Neotropius atherinoides, 24-Eutropiichthys vacha, 25-Eutropiichthys murius, 26-Ailia coila, 27-Gagata cenia*, 28-*Erethistes hara.*

Plate 2: Photographs of ornamental fishes, Barak valley

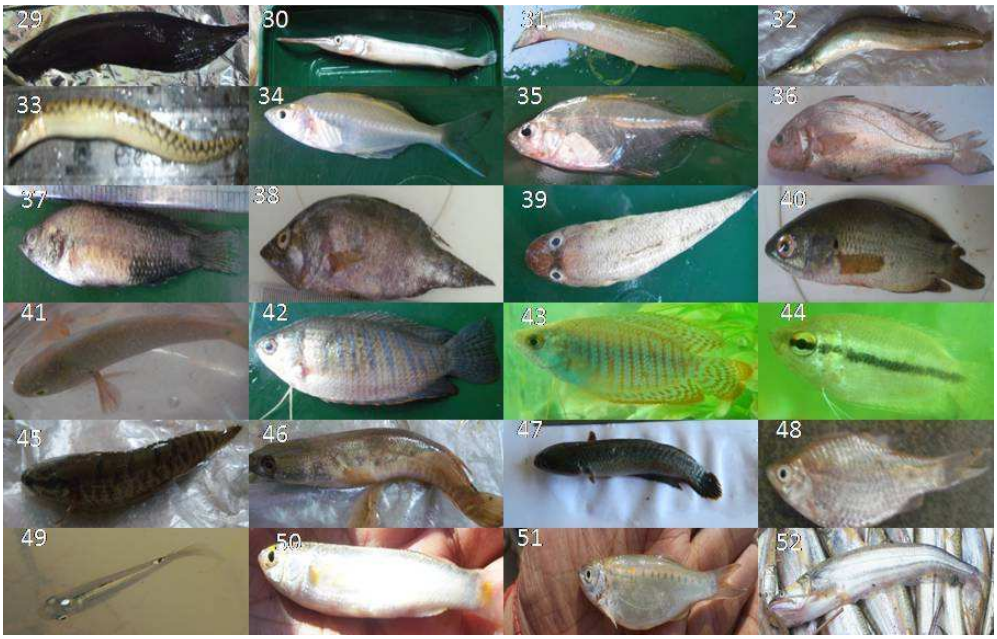

Plate 2:29-52: 29-Heteropneustes fossilis, 30-Xenentodon cancila , 31-Macroganthus pancalus, 32-Macroganthus aral,33- Mastacembellus armatus, 34-Chanda nama,35-Parambasis ranga,36-Johnius coitor,37-Badis badis,38-Nandus nandus ,39-Glossogobius giuris ,40-Anabas cobojius, 41-Anabas testudineus,42- Colisafasciata, 43- Colisa lalia, 44-Trichlogester chuna, 45-Channa punctata, 46-Channa striata,47-Channa orientalis,48-Puntius conchonius,49- Aplochelius panchax ,50- Sicamugil cascasia,51- Barilius bakeri,52- Wallago attu

CONCLUSION

The present study indicates that Barak valley exhibits high ornamental fish diversity but no work has been conducted so far in this region in ornamental fishes. Most of the species recorded were least concerned many are still data deficient and some are not even evaluated according to IUCN red list category. Hence, more survey on ornamental fishes is required. According to CAMP status most of the species are not even evaluated and which signifies that these needs to be evaluated so that the category of the fishes can be ascertained as valuable one.

The people of this region mostly are unaware of the ornamental fish concept due to which many ornamental fishes are sold as food fishes in the markets which otherwise can be sold as ornamental fish in a much higher price. This could be a chance for better upliftment of the economic condition of the local people. The local people can be properly trained about proper handling of ornamental fishes for aquarium market and further propagation as one of the major conservation measure.

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