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Macrophyte and Fish Diversity in the Urpod Beel of Goalpara District, Assam

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Abstract

An investigation was carried out during the period of March, 2019 to February, 2020 in Urpod beel Goalpara district, Assam to evaluate the present status of Fish fauna and Macrophytic diversity of the beel. A total 66 fish species belonging to 42 genera under19 families and 8 orders were recorded during the period of study. The members of order Cypriniformes were dominated by 31 species, followed by Perciformes and Siluriformes with 13 and 12 species respectively, Synbranchiformes with 4 species, Osteoglossiformes and Clupeiformes each with 2 species, Beloniformes and Tetradontiformes with 1 species each. The Macrophytic diversity shows 87 species belonging to 61 genera and 32 families. Out of 87 species 4 species were from Pteridophytes belonging to 4 genera and 4 families and others from Angiosperms. Among Angiosperms 38 species were Dicotyledons under 23 genera and 17 families and 45 species were from Monocotyledons with 34 genera and 11 families. The study reveals that the fish diversity shows a combination of both lotic and lentic forms. During the summer season large parts of the beels are covered by aquatic vegetation like water hyacinth, aquatic grasses, water lilies and other submerged, emergent and floating vegetation. Thus this wetland has been able to prove its worthiness for its supporting many aquatic organisms and plays an important role in maintaining the environmental quality of the areas and its vicinity hence demands its conservation.

Keywords: Fish fauna, Macrophytes, Diversity, Urpod Beel.

Introduction

The flood plain lakes are commonly known as beels, chaurs, tals, pats, moans and jheels in different parts of the country and are mainly distributed in Eastern Bihar, Uttar Pradesh, West Bengal and the North Eastern India. They comprise of an important component of inland aquatic resources of India covering an area of 0.20 million hectors of which north-east region cover a water spread area of 0.12 million hector occur primarily in the Brahmaputra and Barak river basins of Assam and its surrounding areas.

These floodplain lakes or beels play vital role in socio-economic development of the north-east region in general and that of Assam in particular, because of their significant potential in fisheries which could be potentially increased through proper scientific management (Sugunan 1997).

The term aquatic macrophyte refers to macroscopic vegetation including angiosperms, ferns, mosses, liverworts and some freshwater macroalgae that occur in seasonally or permanently in wet environments (Kulsteshtra, 2005). The macrophytes of an aquatic ecosystem serve as a base of food chains and also actively contribute to the promotion and maintenance of aquatic food webs. The macorphytic vegetations may be classify in to Submerged aquatic (SA), Floating aquatic (FA), Emergent aquatic (EA), Free-floating (FF) and Marshy amphibious (MA) (Sculthorpe, 1985).

Aquatic macrophytes diversity and its role in understanding the beel ecosystem have tremendous significance. Some notable works available on macrophytes are Lacoul and Freedman, 2006; Padial et.al., 2008; Chambers et.al., 2008; Rameshkumar et. al., 2019; Noleto et. al., 2019; Rawlekar, 2020. In Assam some works are done by Dey and Kar, 1989; Acharjee et. al., 1997; Goswami etal., 1999; Sarma and Devi, 1999; Deka et.al., 2010; Kalita and Choudhury, 2016.

Aquatic macrophytes represent an important habitat for fish. Many young fish need aquatic macrophytes as shelter and protection from

predation or to avoid cannibalism. Aquatic macrophytes also serve some fish as a spawning habitat, for the attachment of eggs, and some fish form nesting sites among the macrophytes (Cowx and Welcomme, 1998).

Fish species are the invariable living components of water bodies. Fish constitutes almost half of the total number of vertebrates in the world. India is one of the mega biodiversity countries in the World (Mittermeier & Mittermeier, 1997). The North-eastern region of India has been identified as a hotspot of biodiversity by the World Conservation Monitoring Centre (WCMC, 1998). Fish biodiversity of North east India is ranked as second in India. The state of Assam is endowed with copious aquatic wealth in the form beels, swamps, ponds and rivers.

Review of Literature

The wetlands or beels are the prime fishery resources which are highly productive ecosystems providing livelihood support to large sections of the populations next only to agriculture. Some notable works available on this field are Sinha (1994), Kar etal., (2006), Lakra et. al. (2010), Sharma et.al. (2011), Thirumala et. al., (2011), Nath and Deka (2012), Sarkar et.al. (2013), Kar et.al. (2014), Chiary et.al., (2015), Acharjee and Das (2017), Malakar and Baruah, (2017), Chetia et.al. (2018), Talukdar et.al. (2018) etc.

Aim of the Study

Aquatic macrophytes are essential for healthy growth of fishes in natural water body. Opuszynski and Shireman (1995) pointed out that some plants or combination of plant species seems to be a good fish habitats. Presently it is aimed to study the fish and macrophytic diversity of wetland - the Urpod beel, Goalpara district of Assam. But further, the depth study is required to understand the macrophyte-fish interrelationships of the wetland.

Materials and Methods of the Study

Description of the Study Area

Urpod Beel is situated at Agia in Goalpara district, Assam. The geographical location of the district is approximately in between the latitude of 25° 33' to 26° 12' N and longitude of 90° 7' to 91° 5' E. The climate of the district is hot and humid in summer and dry and cool in winter. The Urpod Beel is surrounded by 10 villages and the some villagers earned their livelihood by fishing in the Beel. This beel is connected with Pataka Beel by a small drain located in the eastern side. Perennially, the Beel is fed by Jinziram and Jinari; both are the tributaries of river Brahmaputra.

Analysis of Macrophytes

Macrophytes were collected seasonally from the different sites of the beel and pick and placed in polythine bag and tied up with thread tightly. The macrophytic floras were identified primarily in the field as per as possible and there after bring to the laboratory and identified by consulting standard key and literature (Cook, 1996; Fassett, 2000) and consulting the herbaria of Department of Botany, Gauhati University.

Monitoring of Fish Species

For the study of diversity of fishes in Urpod Beel, the fishes were collected from different sites of the Beel with the help of skilled fisherman and also from the landing sites and markets in the vicinity of the Beel. Different fishing gears and devices used in fishing operation were moving nets (Tonijal, Dhekijal, Khewalijal etc); Stationary net (Gillnet, Hooks) and lines (Ironhooks and Kos) and different types of traps namely Jakoi, Polo, Sepa, Dorki etc. As per as possible, fish species were identified in the field itself and which could not be identified in the field were preserved in 6 % formaldehyde and identified in the laboratory using standard manuals. For identification and classification standard books like Talwar and Jhingran (1991), Jayaram (1999) were used.

Results of the Study

Macrophyte Diversity

During the present study 87 species belonging to 61 different genera, 32 families have been recorded from Urpod beel, Goalpara, Assam with their reproductive phase. Out of 87 species 4 species were from Pteridophytes belonging to 4 families and others were Angiosperms. Among Angiosperms 38 species are Dicotyledons under 23 genera and 17 families and 45 species are from Monocotyledons with 34 genera and 11 families (Table 1 and Fig. 1.1).

Table 1: - List of Macrophytes Along With Their Habitat and Reproductive Phases in Urpod Beel during the Study Period

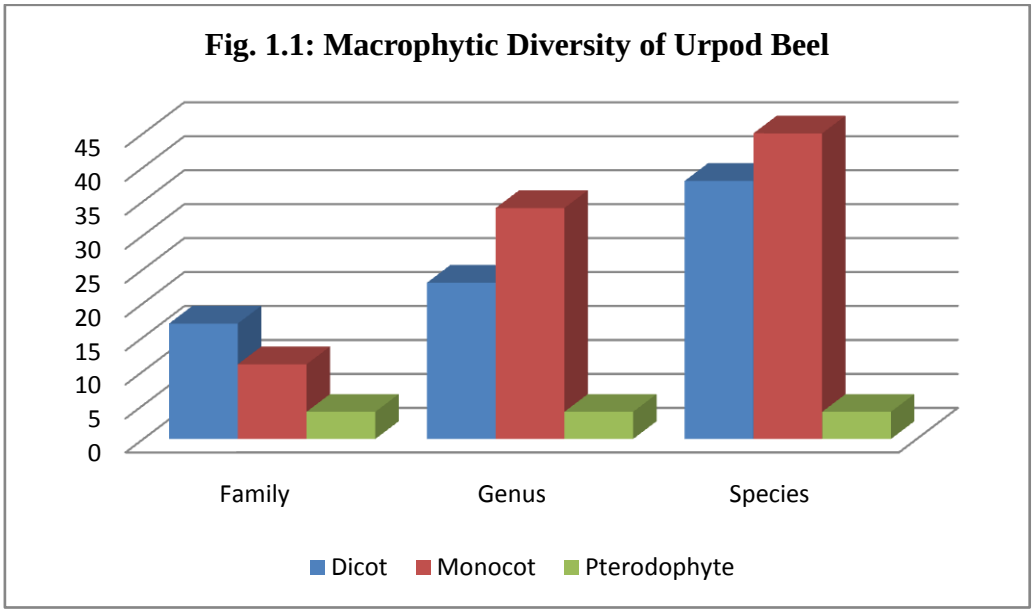
Name of species	Family	Habit	Flowering & Fruiting
Dicotyledonous (Angiosperms)			
Euryale ferox Salish	Nymphaeaceae	FA	May – Jul.
Nymphaea pubescens Willd.	-do-	FA	June – Nov.
N. nouchali Burm f	-do-	FA	Jul. – Oct.
N. rubra Roxb. ex. Salisb,	-do-	FA	Aug. – Dec.
Nelumbo nucifera Gaetrn.	Nelumbonaceae	FA	July.-Oct.
Oxalis corniculata L.	Oxalidaceae	MA	May – Dec.
Myriophyllum tetrandrum Roxb.	Haloragaceae	FA	May – Nov.
M. tuberculatum Roxb.	-do-	FA	Jan. – Dec.
Ludwigia adscendens (L.) Hara.	Onagraceae	FA	Jun – Oct.
L. parviflora Roxb.	-do-	EA	June – Oct.
L. perennis L.	-do-	EA	Aug. – Dec.
Jussiea repens L.	-do-	EA	Mar. – Dec.

Trapa natans L.	Trapaceae	FA	Jul. – Dec.
Centela asiatica L.	Apiaceae	MA	Jan. – Dec.
Oenanthe javanica (Bl.) DC	-do-	EA	Mar. – May
Enhydra fluctuans DC.	Asteraceae	EA	Mar. – Dec.
Grangea maderaspatana (L)Poir.	-do-	MA	Apr. – Nov.
Nymphoides hydrophyllum Lour.	Menyanthaceae	FA	Sept.-Oct.
N. indica (L.) Kuntze	-do-	FA	Sept.-Oct.
N. parvifolium Kuntze.	-do-	FA	Mar.-Nov.
Heliotropium indicum (L) DC.	Boraginaceae	MA	May – Aug.
Ipomoea aquatica Forssk.	Convolvulaceae	EA	Sept. – Feb.
I carnea Jacq.	-do-	EA	Sept. – Feb.
I. obscura (L) Gawl.	-do-	EA	Aug. – Sept.
Bacopa monnieri (L.) Pennel	Scrophulariaceae	MA	Jan. Dec.
Limnophila indica (L.) Druce	-do-	SA	July – Dec.
L. heterophylla (Roxb.) Benth.	-do-	SA	Aug. – Jan.
Utricularia scandens Benj.	Lentibularaceae	SA	July – Nov.
U. stellaris L.f.	-do-	SA	Mar. – Nov.
Alternanthera philoxeroides L.	Amaranthaceae	EA	Oct. – Feb.
A. sessilis L.	-do-	MA	Jan. – Dec.
Polygonum barbatum L.	Polygonaceae	MA	Oct. – Mar.
P. hydropiper L.	-do-	MA	Oct. – Mar.
P. orientale L.	-do-	MA	Apr. – Sept.
Rumex nepalensis Spreng.	-do-	MA	Apr. – Jul.
Podostemun subulatum Gardn.	Podostemaceae	SA	Jun. – Oct.
Ceratophyllum demersum L.	Ceratophyllaceae	SA	Jan. - June
C. tuberculatum Cham.	-do-	SA	Jan. – Mar.
Monocotyledonous (Angiosperms)			
Hydrilla verticillata (Lf.) Royle	Hydrocharitaceae	SA	Oct. – Mar.
Hydrocharis dubia (Bl) Baker.	-do-	SA	Mar. – Nov.
Blyxa aubertii Rich.	-do-	SA	Jan. – Nov.
B. echinosperma (Clarke) Hook	-do-	SA	Jan. – Nov.
Ottelia alismoides (L.) Pers.	-do-	SA	Aug.- Nov.
Vallisneria spiralis L.	-do-	SA	Mar.-Nov.
Eichhornia crassipes Solms.	Pontederiaecae	FF	Jan. – Dec.
Monochoria hastata L.	-do-	EA	Feb. – Nov.
M. vaginalis C.Presl	-do-	EA	Feb. – Nov.
Commelina benghalensis L.	Commelinaceae	MA	Jan. – May
Floscopa scandens Lour	-do-	EA	Jan. – Jun
Murdannia nudiflora L.	-do-	MA	Jul. – Jan.
Acorus calamus L.	Araceae	MA	May – Sept.
Alocasia fornicata (Roxb.) Schott	-do-	MA	May – Sept.
Amorphophallus bulbifera (Scott.) Bl.	-do-	MA	Jun – Sept.
Colocassia esculenta L.	-do-	MA	May – Sept.
Pistia stratiotes L	-do-	FF	Jun – Sept.
Lemna perpusilla Torr.	Lamnaceae	FF	May – Aug.
Lasia spinosa (L.) Thw.	-do-	SA	May – Aug.
Spirodela punctata (Meyer) Thom	-do-	FF	May – Aug.
S. polyrhiza L.Sch	-do-	SA	Jan. – May.
Wolffia globosa Roxb.Griff	-do-	FA	Jun. – Sept.
Sagittaria sagittifolia L.	Alismataceae	EA	Feb. – Apr.
Alisma plantago-aquatica L.	-do-	SA	Feb. – Apr.

Najas graminea Delilea	Najadaceae	SA	Jan. – Dec.
N. minor All	-do-	SA	Mar. – Dec.
Potamogeton crispus L.	Potamogetonaceae	SA	Mar. – Dec.
P. nodosus Poir.	-do-	SA	Mar. – Dec.
P. octandrus Poir.	-do-	SA	Jan. – Dec.
Eriocaulon setaceum L.	Eriocaulaceae	SA	Jun. – Aug.
Cyperus compressus L	Cyperaceae	MA	July – Nov.
C. cephalotes Vahl	-do-	MA	July – Nov.
C. compectus Retz.	-do-	MA	July – Nov.
C. iria L.	-do-	MA	Aug. - Dec.
C. pilosus Vahl, Enum	-do-	MA	July – Dec.
C. rotundus L.	-do-	MA	Mar. – Nov.
Eleocharis congesta D. Don.	-do-	MA	Sept. – Dec.
Fimbristylis acuminate Vahl	-do-	EA	Aug. – Jan.
Arundo donax L.	Poaceae	EA	Aug. – Jan.
Hygroryza aristata Nees.	-do-	EA	Sept. – Mar.
Leersia hexandra Swartz	-do-	EA	Jan. Dec.
Oryza rufipogon Griffith, Notul	-do-	EA	Oct. – Jan.
Phragmites karka (Retz.) Trin	-do-	EA	Sept. – Jan.
Setaria glauca Beauv	-do-	EA	Mar. –Nov.
Saccharum spontaneum L.	-do-	EA	Sept. - Dec.
Pteridophytes			
Equisetum diffusum D. Don.	Equisetaceae	EA	Dec. Mar.
Marsilea quadrifolia L.	Marsiliaceae	FA	May. – Sep.
Azolla pinnata R.Br	Azolaceae	FF	Mar. – Nov.
Salvinia natans (L) All.	Salviniaceae	FF	May – Sep.

MA = Marshy Amphibious;
FA = Floating aquatic;
SA = Submerged aquatic;
EA = Emergent aquatic;
FF= Free Floating

Fig. 1.1: Macrophytic Diversity of Urpod Beel

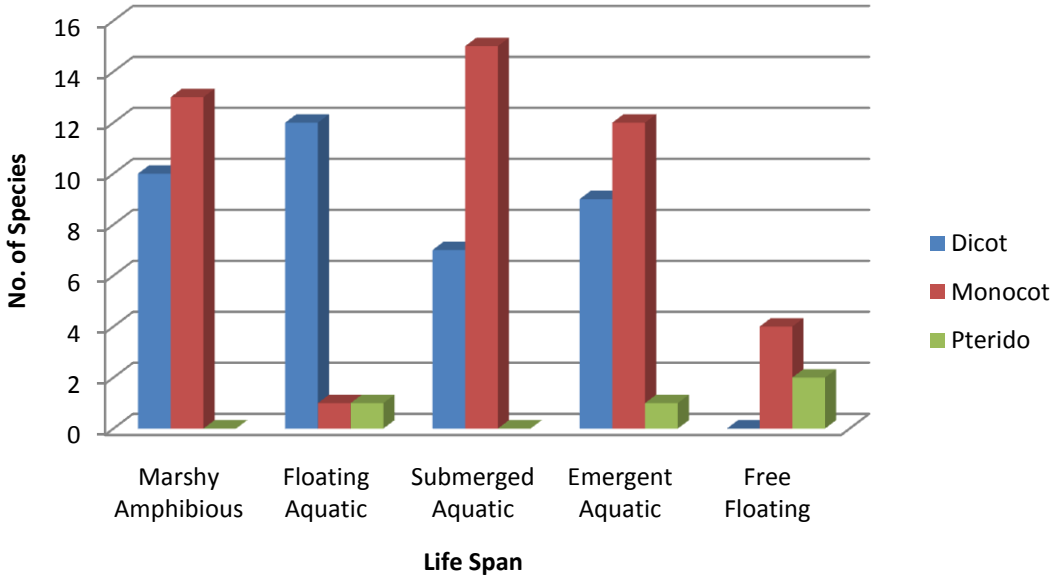


Among the observed Macrophytes, 23 species are belonging to Marshy amphibious (MA), 14 species are Floating aquatic (FA), 22 species are Submerged aquatic (SA), 22 species are Emergent aquatic (EA) and 6 species are found as Free floating (FF) (Fig.1.2). Family Cyperaceae is dominated with 8

species followed by Poaceae with 7 species, Hydrocharitaceae with 6 species, Araceae and Lamnaceae with 5 numbers of species each followed by Nymphaceae, Onagraceae, Polygonaceae with 4 species each; Menyanthaceae, Convolvulaceae, Scrophulariaceae,Commelinaceae,Potamogetonaceae are of with 3 species each; Haloragaceae, Apiaceae, Asteraceae, Lentibularace, Amaranthaceae, Caratophyllaceae, Pontederiaceae, Najadaceae, Alismataceae are of with 2 species each and other families like Nelumbonaceae, Oxalidaceae, Trapaceae, Boraginacea, Podostemaceae, Erioculaceae, Equisetaceae, Marsiliaceae, Azolaceae, Salviniaceae are mono specific (Table 1).

The species availability of Macrophytic family follows the following sequences:
Cyperaceae > Poaceae > Hydrocharitaceae > Lamnaceae, Araceae > Nymphaceae, Onagraceae, Polygonaceae > Menyanthaceae, Convolvulaceae, Scrophulariaceae, Commelinaceae, Potamogetonaceae > Holagraceae, Apiaceae, Asteraceae, Lentibularaceae, Amaranthaceae, Ceratophyllaceae, Pontederiaceae, Najadaceae, Alismataceae > Nelumbonaceae, Oxalidaceae, Trapaceae, Boraginacea, Podostemaceae, Erioculaceae, Equisetaceae, Marsiliaceae, Azolaceae, Salviniaceae

Fig. 1.2: Life forms of Macrophytes of Urpod Beel



Fish Diversity

In the present study 66 species belonging to 42 different genera, 19 families and 8 orders were recorded are shown in tabular form (Table 2).

The members of order Cypriniformes were dominated by 31 species, followed by Perciformes and Siluriformes by 13 and 12 species respectively, Synbranchiformes 4 species,

Table 2: List of Fish Species along with their order, Family, Local Name and Iucn Status

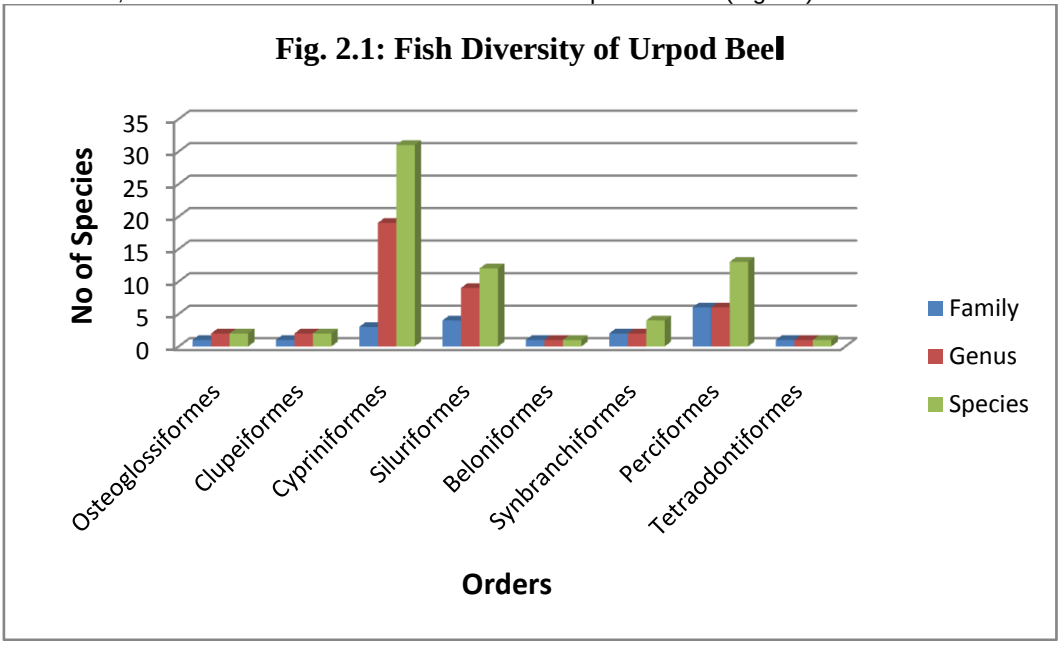
Scientific Name	Local Name	Order	Family	IUCN Status
Notopterus notopterus (Pall.)	Kanduli	Osteoglossiformes	Notopteridae	LC
Chitala chitala (Ham.)	Chital	-do-	-do-	NT
Gudusia chapra (Ham.)	Karati	Clupeiformes	Clupeidae	LC
Barilius barna	Balisanda	-do-	-do-	LC
Salmophasia bacaila (Ham.)	Chelakani	Cypriniformes	Cyprinidae	LC
S. phulo (Ham.)	Chelkani	-do-	-do-	LC
Devario devario Ham	Chelkani	-do-	-do-	LC
Esomus danricus (Ham.)	Dorikona	-do-	-do-	LC
Laubuca laubuca Ham	Dorikona	-do-	-do-	NT
Rasbora daniconius Ham	Dorikona	-do-	-do-	NT
Brachidenio rario Ham-Buch	Phul-dorikona	-do-	-do-	LC
Danio aequipinatus (Mc-Clelland)	Sal-dorikona	-do-	-do-	LC
D. ratio (Ham.)	Lawpatia	-do-	-do-	LC
Ambylpharyngodon mola (Ham.)	Moah	-do-	-do-	LC

Osteobrama cotio cotio (Ham.)	Moah	-do-	-do-	LC
Puntius sophpre (Ham.)	Puthi	-do-	-do-	LC
P. ticto (Ham.)	Puthi	-do-	-do-	LC
P. sarana (Ham.)	Seniputhi	-do-	-do-	LC
P. terio (Ham.)	Puthi	-do-	-do-	NT
P. phutunio (Ham.)	Puthi	-do-	-do-	LC
P. ornatus (Viswanath-Laisram)	Puthi	-do-	-do-	NE
Cirrhinus mrigala (Ham.)	Mirka	-do-	-do-	LC
C. reba (Ham.)	Lachimbhangone	-do-	-do-	VU
Catla catla (Ham.)	Bhakua	-do-	-do-	NEF
Labeo bata (Ham.)	Bhagone	-do-	-do-	NEF
L. calbasu (Ham.)	Kaljal	-do-	-do-	LC
L. gonius (Ham.)	Kurhi	-do-	-do-	LC
L. rohita (Ham.)	Rou	-do-	-do-	LC
Ctenopharyngodon idella Valen.	Grass Carp	-do-	-do-	NEF
Cyprinus carpio Lin.	Common Carp	-do-	-do-	NEF
Hypopthalmichthys molitrix Valen	Silver Carp	-do-	-do-	NT
Acanthocobitis botia (Ham.)	Bali-botia	-do-	Balitoridae	LC
Lepidocephalichthys guntea (Ham)	Botia	-do-	Cobitidae	LC
L. menoni (Pill.&Yaz.)	Botia	-do-	-do-	DD
Botia drio (Ham.)	Batuk mach	-do-	-do-	Vu
Hemibagrus menoda (Ham.)	Gagal	Siluriformes	Bagridae	LC
Sperata aor (Ham.)	Ari	-do-	-do-	Vu
Mystus bleekeri (Dey)	Singorah	-do-	-do-	LC
M. tengara (Ham.)	Tingara	-do-	-do-	LC
M. vittatus(Bloch.)	Tengra	-do-	-do-	LC
Ompok bimaculatus (Bloch)	Pabha	-do-	Siluridae	NT
O. pabda (Ham.)	Pabha	-do-	-do-	NT
Wallago attu (Bloch&Schneider)	Barali	-do-	-do-	NT
Eutropiichthys vacha (Ham.)	Bacha	-do-	Schilbeidae	LC
Clupisoma garua (Ham.)	Nara	-do-	-do-	LC
Clarius batrachus (Lin.)	Magur	-do-	Claridae	NEF
Heteropneustes fossilis (Bloch)	Singi	-do-	-do-	LC
Xenentodon cancila (Ham.)	Kokila	Beloniformes	Belonidae	LC
Monopterus cuchia (Ham.)	Kuchia	Synbranchiformes	Synbranchidae	LC
Macrognathus aral (Bl. &Sch.)	Turi	-do-	Mastacmbelidae	LC
M. puncalus (Ham.)	Turi	-do-	-do-	LC
M. armatus (Lacep.)	Gosi	-do-	-do-	LC
Chanda nama (Ham.)	Chanda	Perciformes	Chandidae	LC
Nandus nandus (Ham.)	Gadgedi	-do-	Nandidae	NT
Glossogobius gutum (Ham.)	Patimutura	-do-	Gobiidae	LC
Anabus testudineus (Bloch)	Kaoi	-do-	Anabantidae	NEF
Colisa fasciatus (Bloch&Schneider)	Khalihna	-do-	Belontidae	NEF
C. lalia (Ham.)	Khlihana	-do-	-do-	NE
C. chuna (Ham.)	Khalihna	-do-	-do-	NE
C. labiosa (Ham.)	Khlihana	-do-	-do-	NE
Channa marulius (Ham.)	Sal	-do-	Channidae	LC
C. punctatus (Bloch)	Goroi	-do-	-do-	NEF
C. striatus (Bloch)	Shol	-do-	-do-	NEF
C. gachua (Ham.)	Chengeli	-do-	-do-	NEF
C. orientlalis (Bloch & Scheider)	Cheng	-do-	-do-	VU
Tetradon cutcutia (Ham.)	Gangatop	Tetraodontiformes	Tetraodontidae	LC

LC – Least Concern; NT – Near Threat; VU – Vulnerable
DD – Data Deficient; NEF – No Entries Found

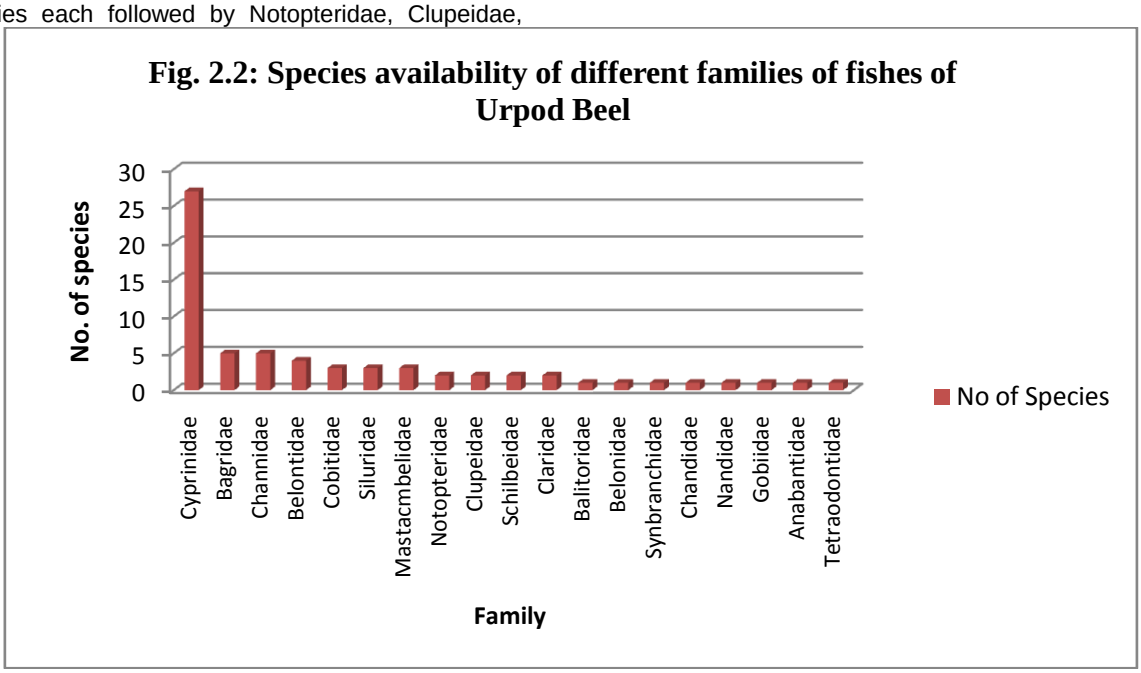
Osteoglossiformes and Clupeiformes each with 2 species, Beloniformes and Tetradontiformes with 1 species each (Fig.2.1).

Fig. 2.1: Fish Diversity of Urpod Beel



Family Cyprinidae is dominated with 27 species followed by Bagridae, Channidae with 5 species, Belontidae with 4 species, Cobitidae, Siluridae and Mastacmbelidae with 3 numbers of species each followed by Notopteridae, Clupeidae, Schilbeidae, Claridae with 2 species each; and other families like Balitoridae, Belonidae, Synbranchidae, Chandidae, Nandidae, Gobiidae, Anabantidae, Tetraodontidae are mono specific (Fig.2.2).

Fig. 2.2: Species availability of different families of fishes of Urpod Beel



The species availability of Fish family of Urpod beel follows the following sequences:

Cyprinidae > Bagridae, Channidae > Belontidae > Cobitidae, Siluridae, Mastacmbelidae > Notopteridae, Clupeidae, Schilbeidae, Claridae > Balitoridae, Belonidae, Synbranchidae, Chandidae, Nandidae, Gobiidae, Anabantidae, Tetraodontidae

Discussion

The results showed that the area was rich in fish biodiversity. It reveals that the fish diversity resources of the beel present a combination of both lotic and lentic forms. A total of 16 reverrine fishes were recorded, the rest are commonly found in lentic habitat. Fish from lotic habitats were *Gudusia chapra, Salmophasia bacaila, Salmophasia phulu, Cirrhinus reba, Catla catla, Labeo calbasu, L. bata, L. gonius, L. rohita, Wallago attu, Ompok pabda, Clupisoma garua, Devario devario, Botia dario, Sperata aor* and *Acanthocobitis botia.* Endangered fish species were recorded in the Urpod beel during the study those

were such as *Cirrhinus reba, Ompak bimaculatus, Ompak pabda and Bracidanio rario.* Again altogether 10 economically important large fish species were found in the beel of which are *Labeo rohita, Catla catla, Labeo calbasu, Channa marulius, C. striatus, Notopterus chitala, N. notopterus, Cirrhinus mrigala, Sperata aor* and *Wallago attu.* Study found that the beel supports various ornamental fishes of which were *Chanda nama, Brachidanio rario, Puntius sophpre, P. ticto* and *P. sarana, P. terio, P. phutunio, P. ornatus, Botia derio, Colisa fasciatus C. lalia, C. chuna* and *C. labiosa.* Three exotic species were also observed in the beel which are *Ctenopharyngodon idella, Cyprinus carpio, Hypopthalmichthys molitrix.*

The Urpod beel appears to be relatively high with respect to the biodiversity of floating aquatic and submerged aquatic macrophytes. The floating aquatic and free-floating plants *Eicchornia crassipes, Azola pinnata, Pistia stratiotes, Lamna perpusila* are exist throughout the year and they become plentiful during the summer. The floating and submerged aquatic plants dominate the Urpod beel habitat. The foremost are the *Euryle ferox, Nymphea rubra, Trapa natans, Azolla pinata, Marselea quadrifolia, Valisnaria spiralis, Hydrilla verticillata* etc. The weeds which are prevalent in the cropped area are *Amaranthus spinosus, Cyperus rutundus ,different species of Cyperus, Solanum torvum, Polygonum hydroiper, P. barbatum, Agaratum conyzoid* etc.

Conclusion

In rainy season large parts of the beels are covered by aquatic vegetation like water hyacinth, aquatic grasses, water lilies and other submerged, emergent and floating vegetation. Aquatic macrophytes are essential for healthy fish growth in a natural water body. It is proved that some plants or combination of plant species seem to be better fish habitats than others.

The wetland produces a large quantity of fishes which support the livelihood of poor families of surrounding villagers by fishing in the beel. The wetland has been also able to prove its worthiness for its supporting many aquatic organisms and it plays an important role in maintaining the environmental quality of the greater areas of Goalpara district. So it is very essential to conserve the wetland for the future generations.

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