



ICHTHYOFAUNAL DIVERSITY OF NONA RIVER FLOWS THROUGH BAKSA AND NALBARI DISTRICT (ASSAM),INDIA

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ABSTRACT:

The current investigation aimed to access the ichthyofaunal diversity of Nona (Mutunga) river flowing through Baksa & Nalbari district of Assam, India. Survey was conducted from Nov 2022 to Oct.2023. Fish specimens were collected from four pre-selected sites, using standard methods and subsequently preserved and identified. A total of 41 fish species belonging to 7 orders, 18 families and 30 genera were recorded. Cypriniformes was the dominant order with 15 species followed by Perciformes with 12 species. Three vulnerable, two near threatened and 36 species under the least concern category were identified based on IUCN status. Anthropogenic threats such as setting up brick industries, garbage dispersal, flow of agricultural pesticide to the river and river digging, etc. may affect the fish population in this river. Awareness among *inhabitants of surrounding villages is needed to address these threats.*

Keywords: *Ichthyofaunal diversity, Nona River, Baksa, Nalbari, Anthropogenic threats.*

INTRODUCTION:

Indian rivers are renowned for their abundant fish diversity making them one of the most significant reserves in the world. People of India particularly those residing in rural areas rely on fresh water fishes as a source of sustenance and livelihood (Vass et.al, 2011). Research studies on diversity and conservation of fish in aquatic ecosystem have always piqued the interest of numerous fishery researchers (Kar et.al,2006). Jayaram (1981) documented a total of 742 freshwater fish species belonging to 230 genera, 64 families and 16 orders. Talwar and Jhingran (1991) reported 930 species of freshwater fishes under 326 genera and 99 families. Most recently, Frouse and Pauly (2021) found the availability of 999 freshwater fish species out of 2801 valid species.

Northeast region of India constitutes a portion of two biodiversity hotspots recognised by Conservation international, namely the Himalayas and Indo Burma, Roach(2005). Hora(1921) is credited with pioneering research on freshwater fishes of NE region, while Dey (1973) conducted an extensive study on ichthyofauna from this region. Ghosh and Lipton (1982) reported 172 species and their economic importance. Sinha (1994) catalogued 230 fish species from the NE region. Nath and Dey(1997) documented a total of 131 fish species solely from the drainages in Arunachal Pradesh. Kar(2003a) discovered the presence of 133 fish species through a pilot survey conducted in 19 rivers spread in Barak drainage(Assam), Mizoram and Tripura. Goswami et al. (2012) listed a comprehensive total of 422 fish species belonging to 39 families from northeast India including Himalayan and Indo Burma biodiversity hotspots.

Assam, a state in the Northeast region of India, is home to a diverse range of fish species. The two major river systems in Assam - Brahmaputra and Barak, are known as the harbours of large Diversity of ichthyofauna. Several studies have been conducted to record the diversity of freshwater fish in the Brahmaputra river and surrounding areas. Motwani et.al (1962) recorded 126 species from 26 families, while Sen (2000) reported 187 species from Assam and its reservoir. Bhattacharya et.al (2003) found 217 fish species inhabiting various water bodies in Assam, belonging to 104 genera, 37 families, and 10 orders. Vishwanath (2017) reviewed and found a cumulative diversity of 229 finfish species in the Brahmaputra drainage system, including 27 endemic species. However, around one-third of these species have not been evaluated according to IUCN red list criteria.

The current investigation is focused on the Nona river a sub tributary of Brahmaputra river in Assam, India that mainly originated from Bhutan. The paper presents for the first time an account of the ichthyofaunal diversity within this river system that connects to Baksa and Nalbari district, Assam, India.

The study aims to document and assess the economic value, present status and existing risks faced by the fish species inhabiting in this riverine environment.

STUDY SITES:

The nona river originates from Bhutan hills (SamdrupJungkhar) where two small rivulets Bogajuli and Daimabari joins to form a single stream known as Mutunga at Dewbari (currently located in Baksa, Assam), which subsequently becomes known as Nona. The total length of the Nona river from its source to its confluence with Baralia river is 63 km. (Brahmaputra Board, 1996). The river has all the characteristics of fleshy river like Pagladia. It also meanders freely and has many loops and slopes. The river nona is bounded by Baralia to the east and Pagladia to the west. Nona joins Baralia river near Kismat village, Nalbari (Assam). The river Baralia is a tributary of Pagladia covers a length of 75 km. The Nona river basin extends latitudinally from 26°22'49" N to 26°48'35"N and longitudinally from 91°32'02"E to 91°36'17"E.

SAMPLING METHODS:

A Survey was conducted throughout pre monsoon, monsoon and post monsoon seasons spanning from Nov 2022 to Oct 2023. Four distinct locations were chosen for study, situated along the banks of the river, namely Daimabari, Pub Hawly (Tamulpur), Akna (Borajol) and Kismat village (Nalbari), Fig:1 shows All the location of study sites. Local fishermen were involved in netting and collection of fish samples.

Additional Information were collected from the local markets situated along the river banks. Fishing gears like fish nets of different mesh sizes were used such as gill nets, caste nets, drag nets, scoop nets, as well as different types of bamboo traps including hooks and lines. Specimens were instantly fixed in 4% formalin solution and after 4 to 8 hours of fixation washing with tap water and transferred to 70% alcohol. A good quality photographs were taken for the study of the specimens and the site of the area. The fish specimens have been identified after standard literature by following Talwar & Jhingran (1991), Viswanath (2002), Kar & Sen (2007), Jayaram (2010). Current conservation status of each species was varified based on the IUCN Red list threatened category version 2022.2. Nomenclature and classification of the collected species updated by using the following websites [http://researcharchive.calacademy.org/research/ichthyology/catalog/Species By Family](http://researcharchive.calacademy.org/research/ichthyology/catalog/Species%20By%20Family) (Eschmeyer and Fong, 2015) and www.fishbase.org (Frouse & Pauly, 2019).

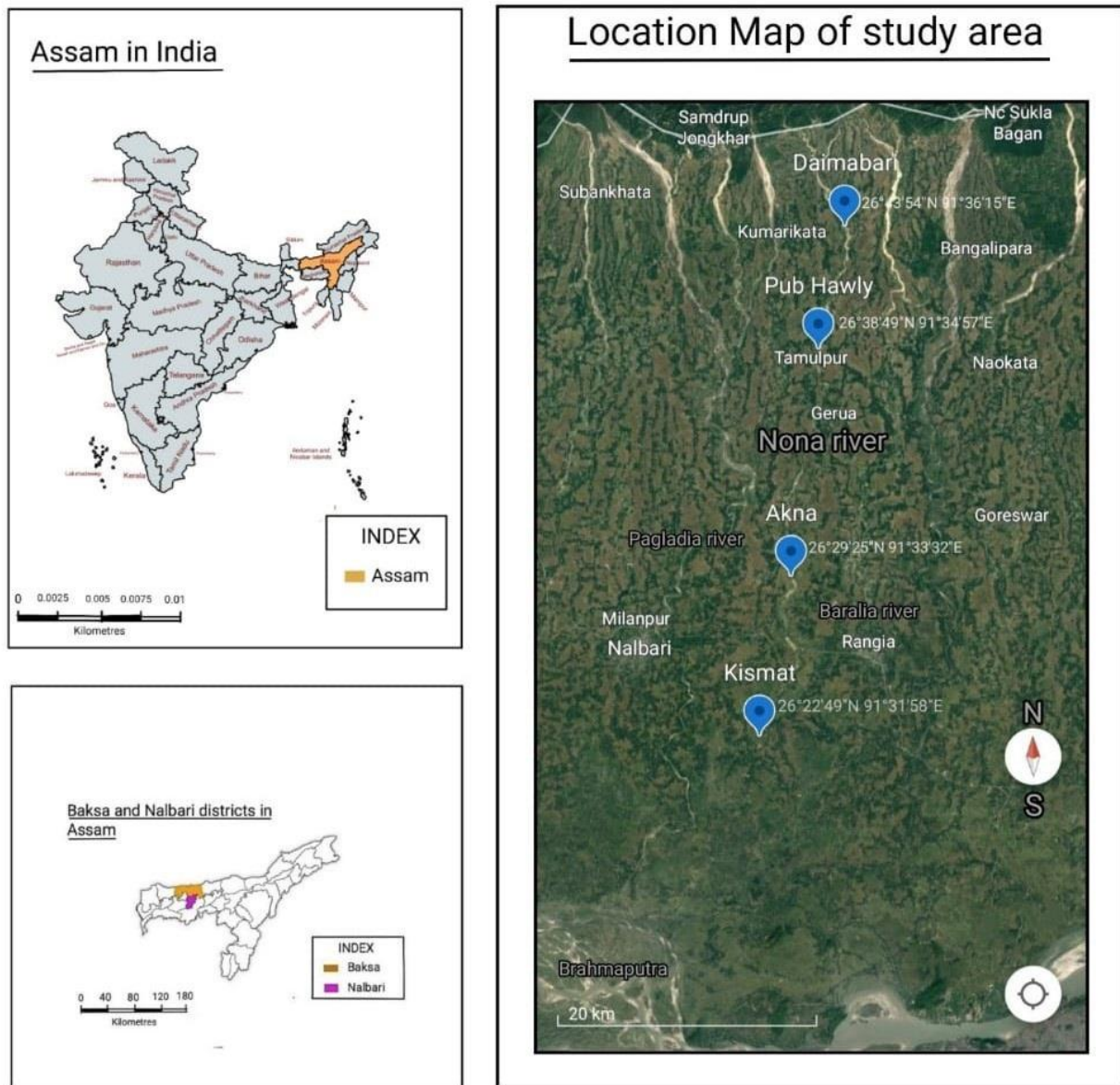


Fig 1: Location Map of study area
Source: Google Earth imagery.

Table 1: Ichthyofaunal diversity of Nona river

ORDER	FAMILY	SPECIES	LOCAL NAME	ECONOMIC VALUE	IUCN STATUSES
OSTEOGLOSSIFORMES	NOTOPTERIDAE	Chitala chitala (Ham-Buch,1822)	Chital	FF, OR	NT
		Notopterus notopterus (Pallas,1769).	Kanduli	FF, OR	LC
CLUPEIFORMES	CLUPEIDAE	Gudusia chapra (Ham. 1822)	Koroti	FF, OR	VU
CYPRINIFORMES	CYPRINIDAE	Amblypharyngodon mola (Ham-Buch, 1822)	Moa	FF, OR	VU
		Catla catla (Ham-Buch,1822)	Bhakua	FF	LC
		Cirrhinus mrigala (Ham-Buch,1822)	Mirika	FF, OR	LC
		Ctenopharyngodon idella (Val. 1844).	Grass Carp	FF, EX	LC
		Cyprinus carpio (Linn. 1758)	Common Carp	FF, EX	VU
		Esomus danricus (Ham-Buch,1822)	Dorikona	FF, OR	LC

ORDER	FAMILY	SPECIES	LOCAL NAME	ECONOMIC VALUE	IUCN STATUS
		Hypophthalmichthys molitrix (Val. 1844)	Silver Carp	FF, EX	NT
		Labeo bata (Ham-Buch,1822)	Bhangon	FF	LC
		Labeo calbasu (Ham-Buch,1822)	Bhakua	FF, OR	LC
		Labeo gonius (Ham-Buch,1822)	Kurhi	FF	LC
		Labeo rohita (Ham-Buch,1822)	Rau	FF	LC
		Puntius sophore (Ham-Buch,1822)	Puthi	FF, OR	LC
		puntius ticto (Ham-Buch,1822)	Puthi	FF, OR	LC
		Puntius juvenicus (Bleeker, 1855)	Puthi	FF, OR	LC
		Salmostoma bacaila (Ham-Buch,1822)	Chelekoni	FF, OR	LC
	COBITIDAE	Lepidocephalichthys guntea (Ham-Buch,1822)	Botia	FF, OR	LC

ORDER	FAMILY	SPECIES	LOCAL NAME	ECONOMIC VALUE	IUCN STATUS
PERCIFORMES	AMBASSIDAE	Chanda nama (Ham-Buch,1822)	Chanda	FF, OR	LC
		Parambassis ranga (Ham-Buch,1822)	Chanda	FF, OR	LC
	NANDIDAE	Nandus nandus (Ham-Buch,1822)	Bhetki/Bhehri	FF, OR	LC
	CICHLIDAE	Oreochromis mossambicus W.K.H.Peters,1852)	Japani Koi	FF, EX	VU
	GOBIDAE	Glossogobius giuris (Ham-Buch,1822)	Panimutura	FF, OR	LC
	ANABANTIDAE	Anabas testudineus (Bloch,1792).	Kawoi	FF, OR	LC
	OSPHRONEMIDAE	Trichogaster fasciatus (Bl.-Schn,1801)	Kholihona	FF, OR	LC
		Trichogaster lalius (Ham. 1822)	Besheli/Besa	FF, OR	LC
	CHANNIDAE	Channa gachua (Bl.-Schn. 1822)	Cheng	FF, OR	LC
		Channa gachua (Bl.-Schn. 1822)	Goroi	FF, OR	LC
		Channa striatus (Bl. 1793)	Sol	FF, OR	LC
		Channa stewarti (Playfair,1867)	Chenar	FF, OR	LC

N.B: LC - Least concern, EN - Endangered, VU - Vulnerable, NT-Near Threatened FF- Food Fish, OR - Ornamental, EX - Exotic species

RESULTS AND DISCUSSION :

A total no of 41 species belonging to 18 family , 7 order and 30 genera were recorded from river Nona(Mutunga) . Cyprinidae was found to be the dominant family with a total of 15 species followed by Channidae (4 species),Bagridae (3 species), Notopteridae (2 species), Mastasimalidae(2 species), Ambassidae (2 species) , Claridae (2species),Osphronemidae (2 species) ,Clupidae (1 species), Cobitidae(1species),Siluridae(1 species) , Heteropneustidae (1 species) , Belonidae (1 species) , Synbranchidae (1species) , nandidae (1 species) , Cichlidae (1 species) , Gobidae (1species) Anabantidae (1 species).

During survey it was found that Out of total of 41 species 9 species have only food value, 32 species have both food and ornamental value. Almost all fishes holds Commercial significance with none being abundant; rather 35 are moderately abundant and 6 species are least abundant .The highly demanded Clarius magur and Wallago attu which hold a high market value as food fish are included in endangered category .Two species are deemed Nearly threatened , while 3 are Vulnerable, however 36 species fall under the category of least concern.All cataagorizations were done based on IUCN Red list of threatened species 2023.The emergence of 6 numbers of exotic fish is alarming sign to this river.

In the upper reach of Nona (Mutunga) river, the riverbed is built up of boulders, shingle and sand with a steep slope, but the downstream is in the alluvial stage. Lower part of the river is susceptible to natural hazard like flood and bank erosion due to less gradient and confluence of Baralia and Nona river along with many small nalas. (Bishya & Saharia et al, 2017). Heavy siltation not only elevates their verbed but also obstructs channels connecting to the beels, this prevents the riverine fish from entering the wetland .

The major problem for this river is unplanned construction of embankment for flood control, setting up of brick industries on the bank of the river, river digging which may lead to destruction of habitat, loss of breeding ground and disrupted migration pattern of fishes. According to Kottelat and Whitten (1996), drastic reduction in abundance of the freshwater fishes in the northeastern region is due to destruction of the habitat, overexploitation and other anthropogenic effects. In addition various human activities such as, over fishing, use of mosquito nets for capturing fishes, use of inorganic poisons, Sewage disposal from Brick industries, garbage disposal from local market and pesticides used in agricultural practices Pose serious threats to the aquatic fauna in this river.



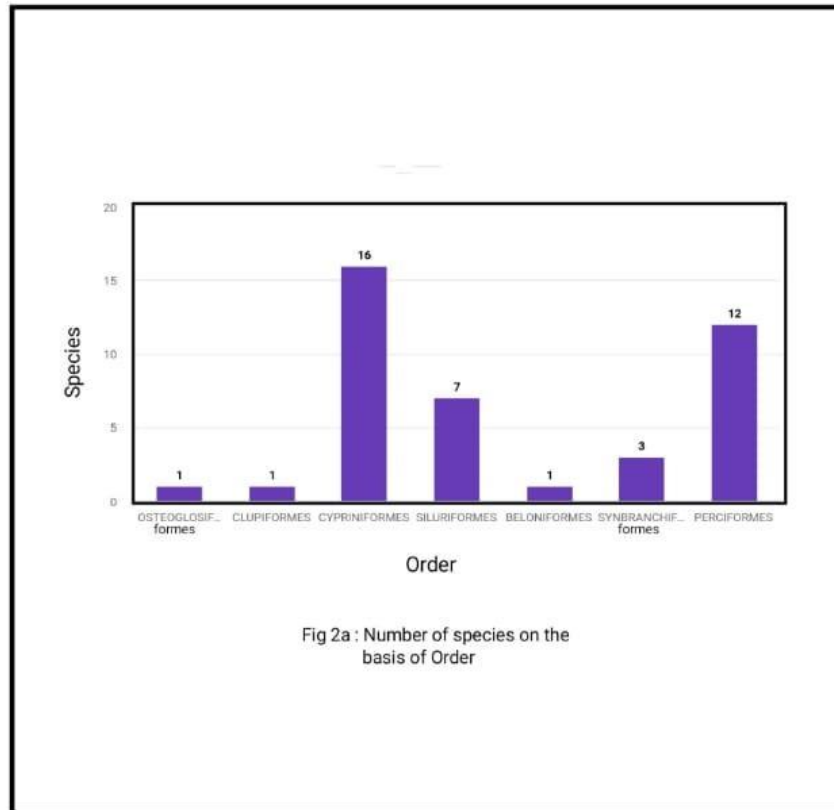


Fig 2a : Number of species on the basis of Order

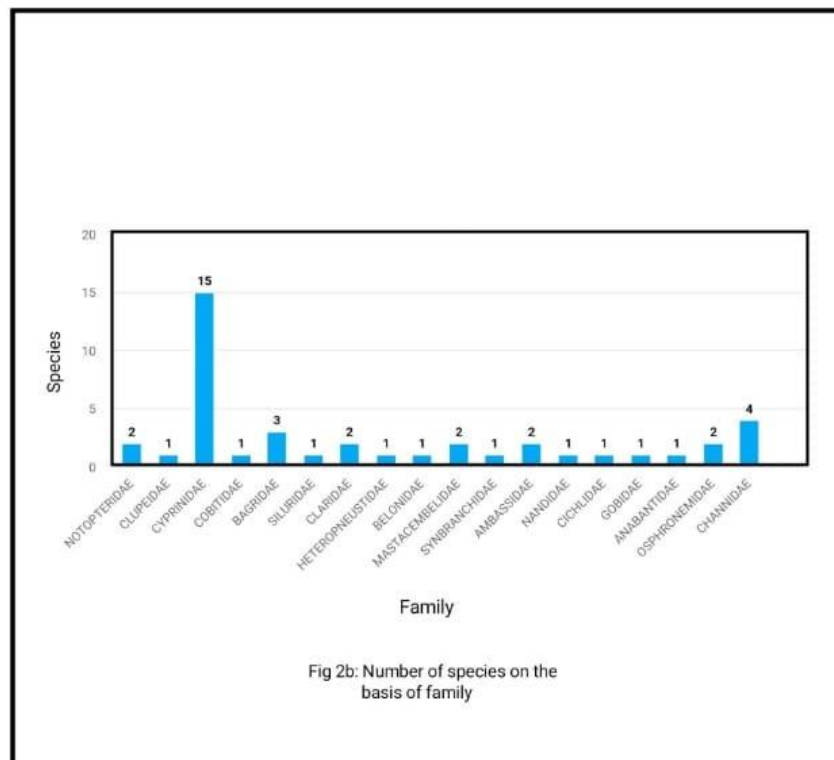


Fig 2b: Number of species on the basis of family

CONCLUSION:

There is a vast potential for further investigation into fish diversity, as the current study was conducted over a period of one year only. As the river is subjected to various anthropogenic impacts, it is possible that fish population may be declining and experiencing fluctuations. Despite many acts and regulations in place many members of general public remain unaware of their existence. Therefore it is imperative to raise awareness among local residents to mitigate pollution risk, prevent overfishing and illegal capturing of brood fishes.

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