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Research Paper

Ichthyofaunal fresh water biodiversity of Trai belt region district Lakhimpur Kheri Uttar Pradesh, India.

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Abstract: India is a mega biodiversity hot spot contributing 11.72% of globe fish biodiversity with (2800) species (marine and fresh water). Total fish production has contributed 1.07 % in Gross Domestic Product (GDP) and 5.34% contribution in agricultural GDP. Uttar Pradesh itself have 124 fish spiciness 74 genera and 28 families and contributed about 14.11% Indian fresh water fish diversity. The present study based on the diversity of Lakhimpur Kheri district. Several species are founded during the survey of local area which included in the 10 order, 21 family and 70 species which are distributed among several water bodies located in the district. The study revealed that biodiversity of fishes was declining due to several anthropogenic and natural activities so it's needed to be conserved with several aspects.

Keywords: Fish Biodiversity, Lakhimpur, Fisheries Diversity Conservation.

Introduction:

Fishes are the major part of vertebrate which play important role in animal biodiversity with 32000 species (marine and fresh water) in global level. India is a mega biodiversity hot spot contributing 11.72% of globe fish biodiversity with (2800) species. Total fish production has contributed 1.07% in Gross Domestic Product (GDP) and 5.34% contribution in agricultural GDP. Uttar Pradesh have 124 fish spiciness 74 genera and 28 families and contributed about 14.11% Indian fresh water fish diversity (Talwar and Jhingran, 1991; Dwivedi et al, 2004, 2007; Kumar et al, 2013; Sarkar et al. 2015). The fish biodiversity of the state is decline rapidly during last few decades due to anthropologic activities, urbanization, environmental changes and degradation, irrigation and power generation and pollution which are directly affected to the natural water bodies and cause direct effects on fish biodiversity (Pandey and Das, 2006; Lakra and Pandey 2009; Lakra 2010; Ayyappan et al, 2011) Lakhimpur

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Kheri is the largest (in area wise) district of Uttar Pradesh state in India has large aquatic resources for fish production and considerable scope of fresh water fisheries and their development for aquaculture production. It is an area of Traibelt region and its fisheries resources are distributed in river (Sharda, Ghaghra, Gomti, Gerua, Suheli, Kandwa, Ull, etc.), wetland, lakes; pond and tanks which have billion cubic meter of water every year into main stream. The Ghaghra contributes the largest amount of water per annum to the entire Ganga basin, (94.4 billion cubic meters) (Sarkar et. al. 2015).These water resourcescontain rich fisheries diversityfishes contain families like Cyprinidae, Bagridae. Siluridae, Mastacembelidae and Schibeidae. Some exotic fish were also affected to the biodiversity of the local fish fauna with their appearance and economic importance among the fish farmers (Singh and Mishra, 2001; Singh et al, 2010; Mayank et al, 2011; Pathak et al, 2011). This district also has protected forest and wild life areas like Dudhwa Tiger Reserve, Kisanpur sanctuary and Kartaniya Ghkarat wild life sanctuary. That's protected areas also have rich aquatic biodiversity like Fishes, Amphibians'Reptiles and other animals.This fauna was reported by different authors but its required sustainable management. The present study provides baseline database, freshwater fish diversity and their conservation of this area.

Study area:

Different water bodies of district Lakhimpure Kheri is a largest area wise district of Uttar Pradesh state in India. It's situated at the border of Nepal and neighbour district are Bahrich, Sitapur, Hardoi, Shahajhanpur and Piliphit.

Table: 1. Details of Study Sites

Sr. No.	Name of sampling site		Latitude and longitudes of sampling site
1	Sharda Nagar	S-01	28.065523°N 80.965967°E • 151 m
2	Bhira	S-02	28.328927°N 80.495577°E • 184 m
3	Palia	S-03	28.434607°N 80.573629°E • 181 m
4	Majhgayi	S-04	28.346748°N 80.693495°E • 175 m
5	Shrinagar	S-05	28.091843°N 80.791439°E • 162 m
6	Khambhi	S-06	28.098593°N 80.882212°E • 161 m
7	Dhaurahara	S-07	27.999390°N 81.094776°E • 152 m
8	PachapediGhat	S-08	28.127788°N 80.841963°E • 158 m
9	MahewaGanj	S-09	27.977224°N 80.785021°E • 159 m
10	LilautiNathmandir	S-10	28.008265°N 80.797524°E • 158 m

Material and methods-

Data collection

During study period site selected Sharda Nagar, Bhira, Palia, Majhgayi, Shrinagar, Khambhi, Dhaurahara, Pachapedi Ghat, Mahewa Ganj and Lilauti Nathmandir. Thefishes were collected by the use of various gears and croft like drag net, gill

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net, purse net, sin net, dip net and fishing boat. The data were collected with the help of local fisherman from different fishing sites and locations of the Tarai belt and their rivers. This research data was collected during study period of March 2016 to February 2018. For research and data collection several sites and rivers were selected like Ghaghra, Sharda, Suheli, kandwa and Ull.

Fish identification –

The identification of fish specimens were done by the morphological, meristic as well as anatomical character basis. Analysis of morphological traits like body shape, size, colour, lateral line position, lateral line scale, mouth shape size and positions, number of fins, fin size, Fin shape, fin spine, fin rays, position of fins, body scale (present or absent), barbils (present or absent), number of barbils, rosets, and ocelus. Fishes were identified by the help of tools and guidelines from (Day 1878, Talwar and Jhingran (1991), Fishes of Uttar Pradesh and bihar by Gopal Ji Srivastwa, 2022 edition.)

Result and discussion

Several species are founded during the survey of local area during study period which were included in the 09 order, 21 family and 70 species which are distributed in the several water bodies located in the district of the Lakhimpur Kheri, Uttar Pradesh, India.

Table: 2. Fish Distribution and Exotic Species Contribution

Name of Order	Siluriformes	Perciformes	Clupeiformes	Synbranchiformes	Cypriniformes	Mugiliformes	Beloniformes	Tetraodonitiformes	Osteoglossiformes
Number of Species	19	09	01	03	29	02	02	02	02
Number of Exotic Species	02	-	-	-	09	-	-	-	-
Exotic Species Contribution in %	10.53%	-	-	-	31.03%				

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Table: 3. Species wise Distribution of Fishes

S. N.	Order	Family	Scientific Name	Common Name / Local Name
1	Siluriformes	Bagridae	*Speretaaor* (Hamilton, 1822)	Tengan
			Sperata seenghala (Sykes, 1839)	Tengan
			Sperata aur	Aur/ Tengra
			Mystus cavasius	Tengra
			Mystus vitatus	Tengra
			Mystus tengra	Tengra
			Rita rita	Belgegra / ptharchatti
		Siluridae	*Ompak pabda*	Pabda
			Ompak bimaculatus	Butter catfish
			Wallago attu	Padhin
		Schilbeidae	*Alia coilia*	Patasi
			Eutropichthy svacha	Vachi
		Sisoridae	*Bagarius bagarius*	Gonchh
		Clariidae	*Clarias batrachus*	DesiMangur
			Clarias gariepinus (Exotic cat fish)	Thai mangur
		Heteropuneustudae	*Heteropneustes fossilis*	Singhi
		Pangasiidae	*Pangasius pangasius*	Pangas
			Pangasiu ssuchi	Pangas
			Pangasius pagasiodon (Exotic cat fish)	Pangas
2	Perciformes	Channidae	*Channa punctatus*	Girai
			Channa striatus	Sauri
			Channa gachua	Saur
			Channa marulius	Sol
		Ambassidae	*Chanda nama*	Chanari
			Chanda ranga	Chanari
		Anabantidae	*Anabu stestiduneus*	Kawai
		Cichlidae	*Oreochromis mossambicus*	Tilapia
		Nandidae	*Nandus nundus*	Dhebari
3	Clupeiformes	Clupeidae	*Gudusia chapra*	Suhiya
4	Synbranchiformes	Mastacembelidae	*Mastacembalus armatus*	Bam
			Mastacembalus panculus	Bamla
		Synbranchidae	*Amphipnouscuchia*	Sapayi / Cuchiya eel
5	Cypriniformes	Cyprinidae	*Catlacatla*	Catla / Bhakur
			Labeo rohita	Rohu
			Labeo calbasu	Karauchh
			Labeo bata	Bata

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			Labeo gonius	Kurai
			Bengana dero	Kalabans
			Labeo angra	Rain
			Cirrhinus mrigala	Mrigal / Nain
			Cirrhinus reba	Raiya
			Hypophthalmichthyes moltrix	Silver carp
			Cyprinus carpio	Common carp
			Cyprinus carpio var. specularis	Mirror carp
			Cypruinuscarpio var. nudus	Leather carp
			Ctenopharyngodon idella	Grass carp
			Osteobramacotio	Gurda
			Puntius sarana	Barb
			Puntius ticto	
			Puntius titius	
			Punteus chola	
			Puntius sphore	
			Amblypharyngodon mola	Dhawai
			Aristichthys nobilis (Exotic carp)	Bighead carp
			Hypophthalmichthys molitrix (Exotic carp)	Silver carp
			Ctenopharyngodon idella (Exotic carp)	Grass carp
			Cyprinus carpio (Exotic carp)	Common carp
			Hypophthalmichthys nobilis (Exotic carp)	Bighead carp
			Colossomama cropomum (Exotic carp)	Pacu carp
			Oreochromis niloticus (Exotic carp)	Tilapia
			Oreochromis mossambicus (Exotic carp)	Tilapia
		Cobitidae	*Botia lohachata*	Bagha
			Lepidocephalichthys guntea	Nakati
6	Mugiliformes	Mugilidae	*Rhinomugil corsula*	Corsula
			Sicamugilca scasia	Mullet
7	Beloniformes	Belonidae	*Xanentodoncancila*	Kaua
			Xenentodon xenentodon	Badakaua
8	Tetraodonitiformes	Tetraodontidae	*Tetraodon cutcutia*	Puffer fish/ Fulani
9	Osteoglossiformes	Notopteridae	*Chitala chitala*	Moh / moi
			Notopterus notopterus	Featherback/ Patra

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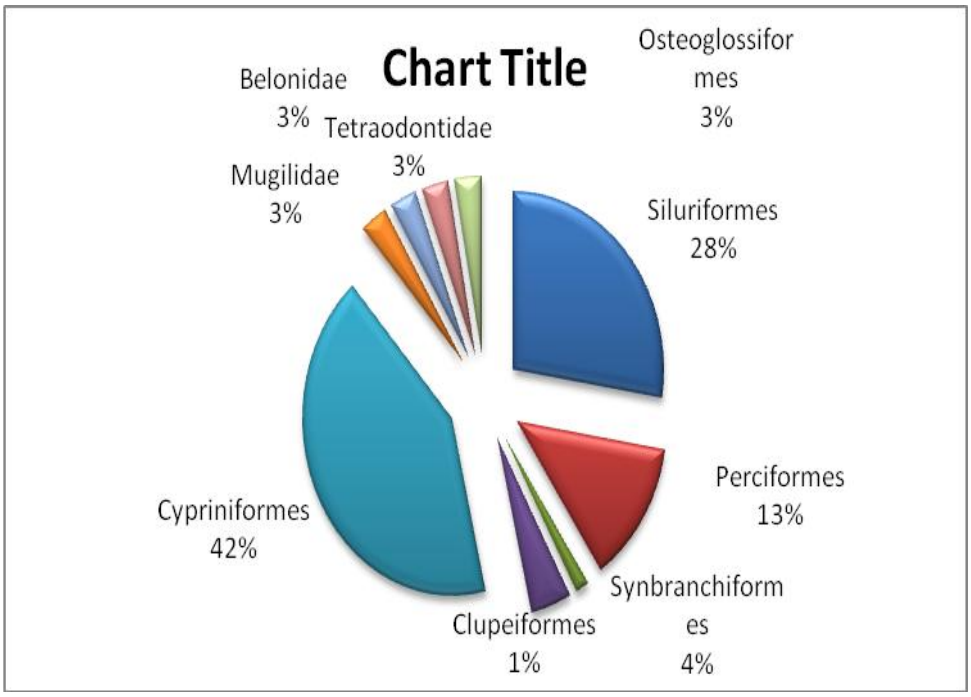

Figure: 1. Graphical Distribution of Species Wise and their % Contribution

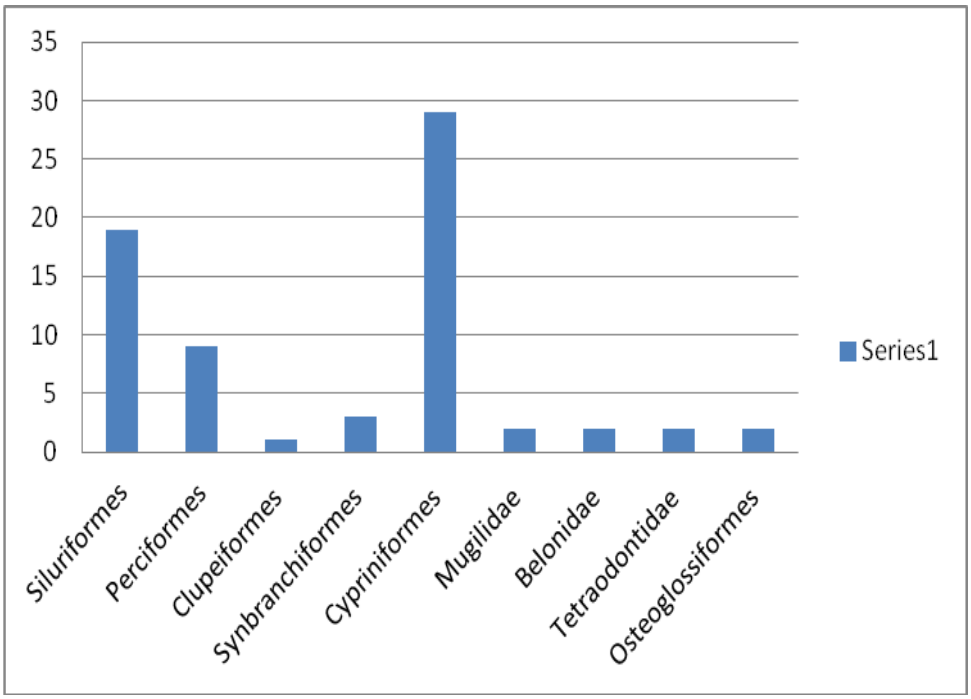

Figure: 2. Biodiversity Distribution of Family with number of Species

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Table: 4. Exotic fish species

S. N.	Order	Family	Scientific name	Common name / local name
	Cypriniformes	Cyprinidae	*Cyprinus carpio*	Common carp
			Cyprinus carpio var. specularis	Mirror carp
			Cypruinuscarpio var. nudus	Leather carp
			Ctenopharyngodonidella (Exotic carp)	Grass carp
			Hypophthalmichthysmolitrix (Exotic carp)	Silver carp
			Aristichthysnobilis (Exotic carp)	Bighead carp
			Colossomamacropomum (Exotic carp)	Pacu carp
			Oreochromisniloticus (Exotic carp)	Tilapia
			Oreochromismossambicus (Exotic carp)	Tilapia
	Siluriformes	Clariidae	*Clariasgariepinus* (Exotic cat fish)	Thai mangur
		Pangasiidae	*Pangasiuspangasiodon*	Pangas

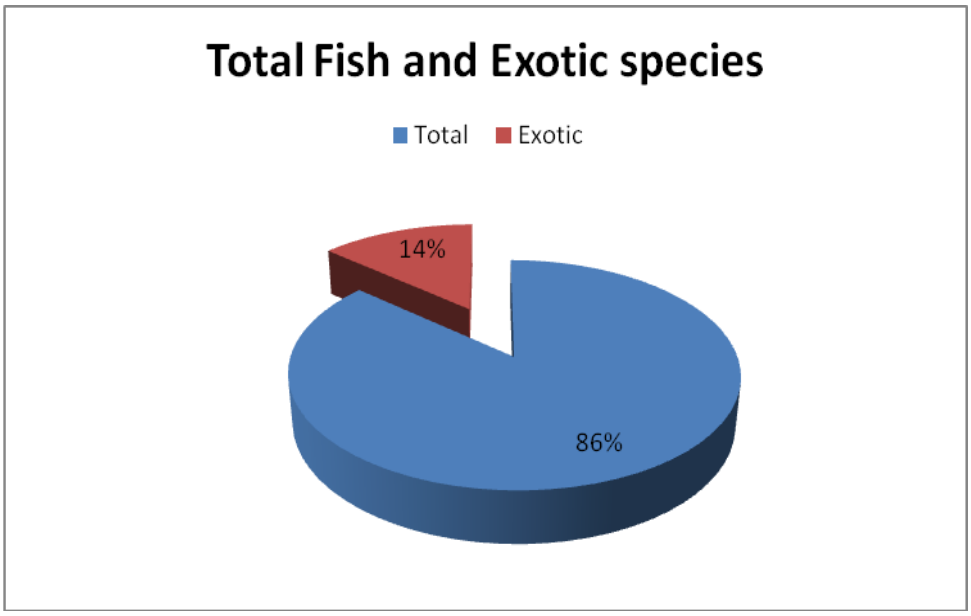

Figure: 3. Exotic contribution in total biodiversity

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In exploratory survey total 70 fish species were reported in the fish biodiversity of Lakhimpur Kheri district in similar studies the 61 species were reported by Gupta and Tripathi, 2017 and 56 fish species reported by Sarkar et al. 2010 in Gomti River. Theseveral Species were identified as fresh water species which came from10 orders and 21 families which included a large part of the Uttar Pradesh fish biodiversity as well as India. During this study the 11 exotic fish species have founded which are occupied in several water bodies but more population near the domestic cultural ponds where there local fish farmer culture fish species for high commercial system.). Sarkar et. al., (2010) similar fish diversity reported in their work on in Gomti river total 70 species, 9 order, 21 families and 42 genera. Singh (2014) suggested and reported in their study that the alien species have potential to disrupt the biological diversity of natural Ecosystem and In the Gomti river 56 fish species belonging 20 families and 42 genera were reported also reported by Srivastava and Singhal (2015). In other similar studies reported that the 56 species belonging to 41 genera, 9 orders and 21 families by Farah Bano& Mohammad Serajuddin (2016).

Conclusion

Based on study and analysis about biodiversity of Lakhimpur Kheri the conclusion drawn the most of species found in least count which indicated the degradable status of the biodiversity similar study reported by Patra and Saha (2013) and Sharma et al. (2014). So it is need to proper action and regulation with challenges for fish faunal diversity conservation through several aspects like the use of various fishing gears and the netting in natural water bodies with proper manners without extra efforts with cause degradation of the biodiversity resources, reduced anthropological activities, management of natural water resources,shares the benefits of biological resources in an equitable manner and also conserves fish biodiversity through aquaculture production technology.

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