



A Study On The Fish Fauna Of Five Selected Sites Of River Gomti, Lucknow, Uttar Pradesh, India.

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Abstract: Lucknow a capital of Uttar Pradesh has vast potential of fish faunal diversity and offers considerable scope of inland fisheries development. Aquaculture activities in rural for most of the fisherman area. In order to establish fish faunal diversity of Lucknow a preliminary, data have been collected with the help of local fish farmers and market survey. Various lentic and lotic water bodies of 5 different locations of the district have been collected. During the study period, 35 fish species, 16 Families and 7 Orders have been identified. The present study showed that Lucknow possesses rich fish diversity but proper conservation measures are required to maintain sustainability and richness of the species diversity of the district.

Keywords: Fish diversity, Faunal, Aquaculture activities, Defragmentation.

Introduction

Fish diversity within the fresh water ecosystem has a great importance in terms of the livelihood and the economic importance of the people living around it. Accordingly the relation between the biodiversity and human wellbeing is interrelated and is being promoted increasingly through the concept of ecosystem services provide by the species. Biodiversity is essential for stabilization of ecosystem, protection of overall environmental quality for better understanding intrinsic species on the Earth (Vijaykumar, 2008). In recent years, it was realized that the fish and freshwaters are one of the most vulnerable resources in nature that have been heavily impacted by human usage and regulation. Uttar Pradesh, one of the largest states in India, has vast potential of aquatic bio resources and offers considerable scope of inland fisheries development and aquaculture. Riverine ecosystem of India have suffered from intense human intervention resulting in habitat loss and degradation and as a consequence many freshwater fish species have become heavily endangered, particular in Gomti where heavy demand is placed on fresh water. This was coupled with irreversible changes

in natural population by introductions of exotic species and diseases (Dudgeon et al.2005; Arthington and Welcomme 1995; Arthington *et al.* 2004; De Silva and Abery 2007). The fisheries sector in India has third in the world in total fish production and contributes around 1.07 % of the country's GDP and 5.34% of the agricultural GDP. With the third position in fisheries, the country has high potential in this sector for rural development, nutritional security and employment generation (Prakash, 2021; Singh and Prakash, 2022). Thus there is an urgent need for proper inventorisation and documentation of this diversity in order to develop a fresh water diversity information system (Islam *et al.*,2013). Ichthyofaunal diversity refers to variety of fish species (Johnson *et al.*, 2012) fishery plays an instrumental role in the socio- economic development of the country, as it is a valuable resource of livelihood for a huge section of economically backward population. It also generates employment, alternate income and stimulates growth of new subsidiary industries (Goswami *et al.*, 2012). Uttar Pradesh has vast potential of aquatic bio resources and offers considerable scope of inland fisheries development and aquaculture. State contributes approximately 14.68% of the total national fish diversity (Lakra, 2010) and resources are available in the form of 28,500 km of rivers and canals, 1.38 lakh ha of reservoirs and 1.61 lakh ha of ponds and tanks as well as 1.33 lakh ha of floodplain lakes and derelict water.

Materials and Methods

Fishing was carried out with the help of local fishers using gill net, cast net, drag net, scoop net including hooks and lines (Bose et al., 2013). The samples were collected from tanks, lakes, rivers (Gomti), irrigation canals and fish markets. Gomti is the main river which flows from west to east and cover entire length of the district. As soon as the small fishes were collected they were directly placed in a wide mouth jar having 2 liter capacity with 8% formalin solution (Bagra, 2010). Separate jar was used for preserving individual species and brought to the laboratory for identification. Fresh or preserved samples were identified on the standard taxonomic keys for fishes (Day, 1996; Talwar and Jhingran, 1991). In addition various morphological characters, shape, colors etc were recorded by FAO Identification Sheets, Srivastava (2002), ITIS (Integrated Taxonomic Information System) Standard Report (<http://www.itis.gov>), Fish Base (<http://fishbase.org>). The collected fish were identified up to species level. For the present study, five sampling sites were made on the river gomti, lucknow, in a stretch of 30 kilometres. The five sites of gomti river are: Gau ghat, Kudiya ghat, pakka pul, Daliganj bridge, hanuman setu.

Gaughat: It is an upstream station at the out-skirt of the city and raw water intake point for drinking water supply of the city. The river receives no municipal sewage before this water pumping station, except the effluents from sugar mill located at Hargaon of district Sitapur

Kudiya ghat: This sampling station is located between the Gau ghat and Pakka pul. This sampling site is contaminated due to detergent mainly used by washerman. At this point river received domestic wastes mainly plastic material and domestic discharge as well as hospital discharge.

Pakkapul: This sampling station is approximately 2 km. down to Gaughat. This point of river receives residues of burnt dead bodies from the crematorium at Gulela ghat, a little down to the first station.

Daliganj Bridge: This station is located approximately 3 km. down to the first station. River receives municipal sewages from Daliganj area of Lucknow city.

Hanuman Setu: This station is situated adjacent to University of Lucknow and approximately 1 km. down from the Daliganj bridge, receiving domestic sewage and effluents from automobile workshop, educational institutions and research laboratories.

Observation:

Table 1: Fish diversity of Lucknow district (Uttar Pradesh).

Order	Family	Scientific name	Common Name
Clupeiformes	Clupeidae	<i>Gudusiachapra</i>	Suhia
		<i>Gudusiagodanahiai</i>	Godanahiasuhia
		<i>Gonialosamanmina</i>	Majhalisuhia
	Engraulidae	<i>Setipinnaphasa</i>	Phansi
	Notopteridae	<i>Chitalachitala</i>	Moi/ knifefish
		<i>Notopterusnotopterus</i>	Patra/ featherback
Cypriniformes	Cyprinidae	<i>Amblypharyngodonmola</i>	Dhawai
		<i>Aspidopariajaya</i>	Jaya
		<i>Catlacatla</i>	Bhakur/ Catla
		<i>Cirrihinareba</i>	Raia
		<i>Cyprinuscarpiocommunis</i>	Common carp
		<i>Cyprinuscarpiospecularis</i>	Common carp
		<i>Cyprinuscarpionudus</i>	Common carp
		<i>Labeobata</i>	Bata
		<i>Labeorohita</i>	Rohu
	Siluridae	<i>Wallago attu</i>	Padhani/Barari
	Bagridae	<i>Mystusbleekeri</i>	Tengra
		<i>Mystustengara</i>	Tengana
	Sisoridae	<i>Bagariusbagarius</i>	Gonch

		<i>Gangatacenia</i>	Tinkatia
		<i>Hara hara</i>	Panahi
	Schilbeidae	<i>Ailiacoila</i>	Patasi/Minti
		<i>Clupisomagarua</i>	Baikari/Karahi
	Saccobranchidae	<i>Heteropneustesfossilis</i>	Singhi
	Clariidae	<i>Clariasbatrachus</i>	Mangur
Beloniformes	Belonidae	<i>Xenentodoncancila</i>	Kauwa
Mugiliformes	Mugilidae	<i>Rhinomugilcorsula</i>	Corsula
Ophiocephaliformes	Channidae	<i>Channagachua</i>	Chanaga
		<i>Channamarulius</i>	Saur
		<i>Channa punctatus</i>	Girai
Perciformes	Centropomidae	<i>Chanda baculis</i>	Chanri
		<i>Chanda nama</i>	Chanri
	Anabantidae	<i>Anabas testudineus</i>	Kawai
		<i>Colisalalius</i>	Khosti
Tetraodontiformes	Tetraodontidae	<i>Tetraodon cutcutia</i>	Ocellated Pufferfish

Fig. 1 Diagrammatic representation of per cent contribution in each order

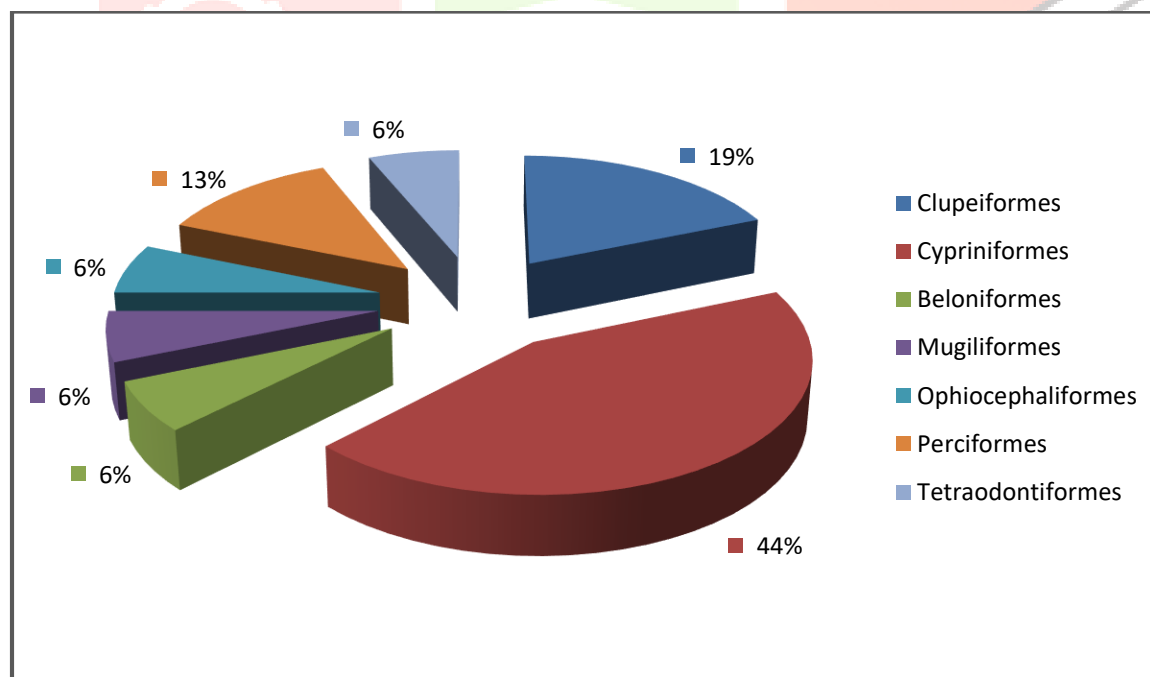


Fig. 2 Diagrammatic representation of per cent contribution in each Family

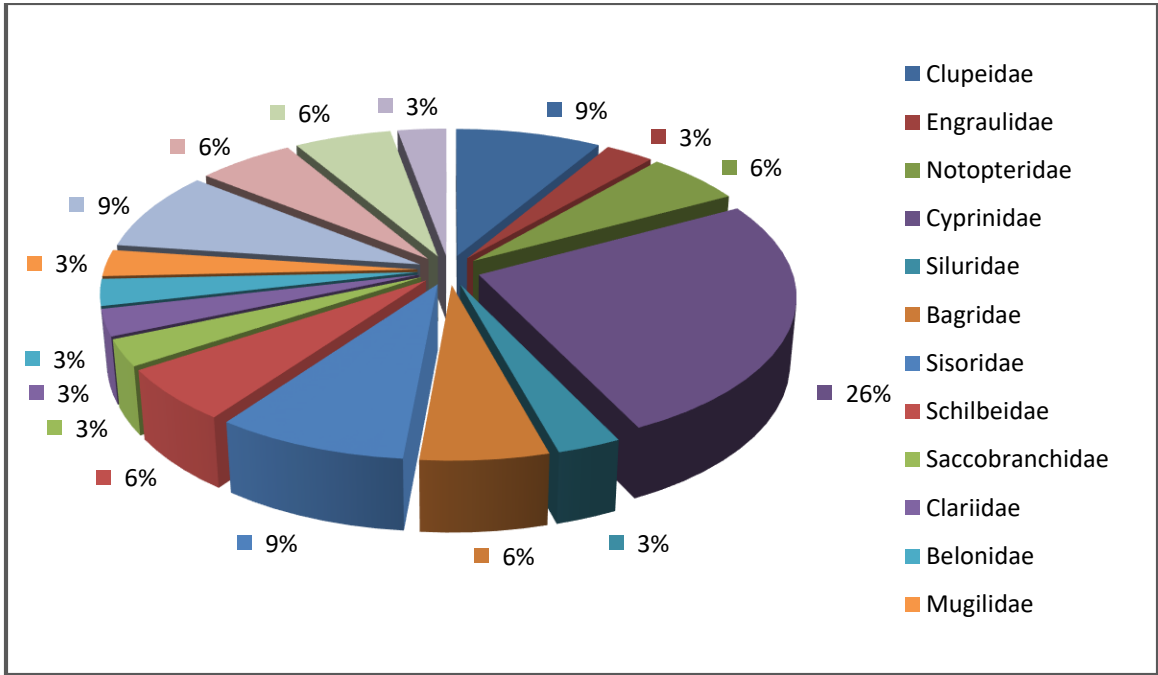




Fig.1-2 Shows pumping station and sampling site of Gau ghat

Fig.3 Shows sampling site of pipa pul

Fig.4 Shows sampling site of Pakkapul

Fig.5 Shows sampling site of Kudiya ghat

Fig.6 Shows sampling site of Hanuman setu



Fig. 1 Showing *Labeo rohita* (Hamilton, 1822)

Fig. 2 Showing *Saharan aphanus*

Fig. 3 Showing *Mystus tengara* (Hamilton, 1822)

Fig. 4 Showing *Mastacembelus armatus* (Lacepede 1800)

Fig. 5 Showing *Puntius sarana* (Hamilton, 1822)

Fig. 6 Showing another species of *Mystus* sp. (Hamilton, 1822)

Fig. 7 Showing *Heteropneustes fossilis* (Bloch, 1794)

Fig. 8 Showing *Wallago attu* (Bloch & Schneider, 1801)

Fig. 9 Showing *Chitala chitala* (Hamilton, 1822)

Fig. 10 Showing *Channa punctata* (Bloch, 1793)

Results and Discussion

Lucknow has vast freshwater fisheries resources which consist of lentic and lotic water bodies exclusively of culture fishery from seasonal, perennial and culture ponds and capture fishery from rivers, nullas and irrigation canals. Present fish biodiversity in the river originate mainly from natural reproduction or escape from the numerous water bodies of the district. During the study period fish faunal diversity was noticed of which 35 fish species, 16 families and 7 orders were identified (Table1). After morphometric and meristic analysis of all specimens found the Order Cypriniformes (56 species) contributed maximum as compared After morphometric and meristic analysis of all specimens found the Order Cypriniformes (19 species) contributed maximum as compared to Perciformes (4 species) and Clupeiformes (6 species). Ophiocephaliformes comprise 3 species while and Mugiliformes contributed 1 species whereas Beloniformes and Tetraodontiformes shared one species. The dominant order was Cypriniformes (minnows and carps) comprising 44% of all the number of species recorded. Next to Cypriniformes, other dominant orders were Perciformes, Clupeiformes and Ophiocephaliformes constituting 13%, 19% and 6% of species recorded, respectively (Fig. 1). All others order like Mugiliformes, Beloniformes, Tetraodontiformes, 6%, 6%, 6% contribute respectively. The dominant family was Cyprinidae comprising 26% of the total number of species abundancy (Fig. 2) and comprises Amblypharyngodonmola, Aspidopariajaya, Catlacatla Cirrihinareba,, Cyprinus carpio communis, Cyprinus carpio specularis, Cyprinus carpio nudus, Labeobata, Labeorohita. Fish diversity in terms of number (35 species) observed in Lucknow district. The fisheries of riverine system are based on relatively large number of species and a wide range of fishing gears. Fish biodiversity in the district alters by habitat degradation, invasion of exotic fishes and fishing pressure is the main cause is (Lakra *et al.*, 2008; Lakra, 2010). Environmental stress and fishing pressure are reflected in the fish community composition and biodiversity of fishes (Dwivedi and Nautiyal, 2010; Mayank *et al.*, 2011; Kumar, 2012; Tamboli and Jha, 2012). Present study indicates the changing scenario of fish diversity of Lucknow district. The environmental threats could be man-made and natural or in combination with cascading and interlinked impacts. Conservation and sustainable utilization of natural resources are issues receiving global attention after signing the Convention on Biological Diversity (CBD, 1992). Though not much published literature is available on the threat status of fish species of Uttar Pradesh, yet it is fact that population of some species is constantly going down and there is an urgent need to protect the same for posterity. According to recent conservation assessment of NBFGR, a total of 20 freshwater fishes are categorized as threatened of which 9 under endangered and 11 vulnerable (Lakra, 2010). Due to lack of sufficient information on occurrence and abundance of fish species of Lucknow, is not possible to quantify the rate of decline in its diversity but this report would be useful as baseline data for any future assessment and conservation plan for fisheries. However, more awareness and motivation is required on the value of indigenous fish diversity and conservation of aquatic resources to ensure the sharing of benefits of its utilization in an equitable manner so

that the aquatic ecosystem gets adequate time to recover its natural community structure (Lakra and Pandey, 2009; Lakra, 2010).

Conclusion

The overall study were carried out through 5 sampling sites of river gomti at Lucknow region shows that the number of fish diversity belongs to various orders and their number were also fluctuated by extra manipulated activities from the related society.

The prosperity of fish biodiversity in the river is measured to be elevated. Anthropogenic activities like overpopulation, commercial development, haphazard exercise of chemical pesticides and fertilizers, territory variation, water distraction and preamble of foreign species were found to be the cause for the hazard to the fish fauna in river Gomti. Vulnerability to loss was not the equal for all the recorded fish species. A number of fishes with bulky body size, high food worth and narrow choice of distribution are extra vulnerable to threats, and according to the IUCN present information, a quantity of the fish species are in the situation of severe risk to acquire vanished in next to future.

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