



Fish Diversity and Spatial Distribution in Gandak Floodplains of Gopalganj District, Bihar (India)

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ABSTRACT

This study was performed to evaluate fish diversity, community structure, spatial distribution and conservation status in 5.8 km stretch of Gandak floodplain sites from Mangalpur to Khajuria ghat with three selected reservoirs during 2021 showed different major, minor and miscellaneous fishes with some ornamental fishes. The existed fishes showed variable fish abundance at sites unless investigation was performed to one year duration.

Keywords: Fish diversity, Community structure, Spatial distribution, Gandak river floodplains

INTRODUCTION

The Gandak River is one of the major tributaries of Ganges fed by perpetual snow of the Himalayas. The river flows about 300 km through Bihar with freshwater fish account 40% of all reported species (Bhat, 2000). There is intensive previous work of upper stretch in the Gandak river from Bhaisalotan site (David, 1963). They conducted fishery survey in primary stretch of the river. Some workers investigated fish richness of different freshwater systems in India, however, only few fragmented reports were available about Gandak river.

The aquatic diversity experiences serious threats about both diversity and ecosystem stability. India is one of the mega biodiversity hotspots in the world and occupies the ninth position in terms of freshwater mega biodiversity. It is needful to develop research and systematic conservation planning to protect freshwater biodiversity (Lakra *et al.*, 2010, Kathirvelpandian, 2010). Various methods and strategies have been proposed by many workers (Lakra *et al.*, 2006).

The Ganga river system have about 11 orders, 30 families, 72 genera and 141 species (Menon, 1974) has listed 141 species, belonging to 72 genera, 30 families and 11 orders from Ganga River system. However, there are no complete records on fish diversity in gandak river floodplain sites in Gopalganj district. This study is an

approach to examine the fish diversity and community distribution in this region is important due to abundance of several fish species.

MATERIALS AND METHODS

The Gandak River floodplain sites in eastern India have been selected for this study. This aquatic ecosystem contains rich flora and fauna records. The area investigated during April 2020 to March 2021 in which fish survey conducted with the help of local fishermen and fish catches through different size gill net, cast net, trap and angles. The sampled specimens were preserved in 10 % formalin for identification after photography. The fishes were identified following taxonomic publications (Talwar and Jhingaran, 1991; Jayaram, 1999 and Das *et al.*, 2010).

RESULTS

In the present study in all 23 fish species were recorded belonging to 9 families from 5.6 km stretch of Gandak river floodplain sites. Taxonomic position, vernacular name, conservation status and spot of collection of the individual fish species assorted according to family are listed in table 1. During the course of investigation maximum number of species belonged to family Cyprinidae (18) followed by Bagridae (6) and Channidae (5). The family Schilbeidae, Tetraodontidae and Cobitidae represented (3) species each. Notopteridae, Siluridae, Ambassidae and Mastacembelidae represented 2 species each family.

Families Sisoridae, Claridae, Heteropneustidae, Belonidae, Belontiidae, Nandidae, Gobiidae and Anabantidae were represented by only 1 species each (Figure 1)

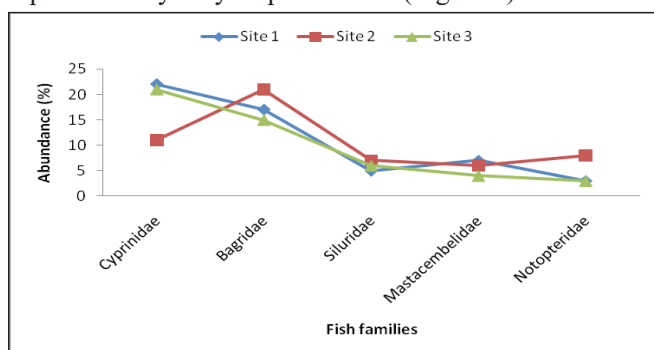


Figure 1: Fish abundance in selected sites of Gandak floodplains

The Cyprinidae contributed highest of 33% fish species, among which, *Cabdio morar* (Chepua) and *Puntius* sp. (Sidhari) were the most abundant forms, *Labeo rohita* (Rohu), *Catla catla* (Bhakur) and *Cirrhinus mrigala* (Nain) were not found in good number but *Labeo bata*, *Labeo boga* and *Labeo calbasu* occurred in good quantity. *Mystus* sp. was recorded in abundance with the occurrence all the year round (Table 1).

Fishers catch on an average about 5-6 kg of fish daily dominated by miscellaneous and cat fishes. According to fishers assumption, the fish catch of the river floodplains has declined during last 20 years probably due to climate change, fishing of brood stock in the spawning ground through fishing net with small mesh size.

DISCUSSION

There is lack of complete records on the fishery potential in the Gandak river floodplains sites. River is the major source of fisheries and significantly shares to the inland fish production; however, anthropogenic activities during recent years changed water quality through water

abstraction, dam construction, sedimentation and illogical fishing. These have discerningly adverse effect on natural fish production, which showed constant declining trends.

This study showed fish diversity alteration in floodplains due to spatial and temporal characteristics of studied sites in this investigation and also previously, David (1963) listed 113 fish species in the Gandak River at upper stretch, 161 km above and 24 km below the Bhaisalotan barrage.

David (1963) recorded availability of *Hilsa ilisha* from close to Bettiah but in the present study, it was not recorded in this stretch. Exotic fishes like *Cyprinus carpio* was also recorded from the river but their number of catch was negligible. It is a sad commentary that the Indian Major Carps have declined sharply in the last one decade while forage and catfishes are increasing drastically in the river.

A good number of ornamental fishes were also recorded during the present investigation. Due to lack of proper knowledge of the value and marketing of ornamental fishes among the fishers, these are sold at a very low price. Most of the fish catch is sold by fishers on spot to brokers and brokers finally sale it in local fish markets at higher rates.

CONCLUSIONS

The immature fishing has been during the study period, which has resulted in tremendous decrease of major carps. Therefore, fishery provisions should be strictly followed to protect fish species especially Indian major carps. Indian major carps are high priced fishes, but their stocks are declining. The local fishermen explained reduced fish catch due to indiscriminate fishing, usage of fine nets, siltation, changing land use pattern and flood. This has resulted and forced many of them to migrate and change their profession.

Table 1: Fish groups in Gandak river floodplain sites during study period

Family	Genus	Site 1	Site 2	Site 3	Richness	Abundance	Relative abundance
Cyprinidae	Catla	9	3	6	3	47	21.4
	Labeo	7	3	5	4	28	12.7
	Salmostoma	2	3	4	1	6	2.7
	Mystus	2	9	5	2	11	5
	Puntius	3	6	2	2	6	2.7
Bagridae	Rita	6	13	8	3	12	5.4
	Mystus	4	15	9	1	4	1.8
Siluridae	Ompok	3	8	6	2	12	5.14
Mastacembelus	Mastacembelus	8	7	4	3	19	8.6
Notopteridae	Notopterus	5	10	6	3	25	11.4

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