



## IMPACT OF INVASIVE FISHES ON THE NATIVE FISH FAUNA OF RIVER YAMUNA AT MATHURA DISTRICT, U.P.

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### ABSTRACT

In terms of the status of Invasive fish species significance presence of *Oreochromis niloticus*, *Cyprinus carpio*, *Hypophthalmichthys molitrix* and *Clarias geripineus* is evident in majority of the river stretches. A preliminary record shows that 48-fish species belonging to 13-families were recorded in Mathura waters so far. Species of the family Cyprinidae were most dominant followed by Bagaridae, Schilbeidae, Clupeidae, Ophiocephalidae. As far as concern with the trophic utilization of fishes; carnivorous fishes were dominant followed by herbivorous and omnivorous. Now present condition has changed in terms of native fish fauna are gradually decreasing.

It has been recorded that presence of invasive fishes gradually establishing themselves as a breeding population replacing the Indian Native Fish Fauna. Study reveals that the use of Yamuna river water for the purpose of hydal projects, irrigation and drinking purpose and water pollution are the main threats affecting the habitat of native species and has provide a favorable environment for the alien fishes. So, need of the hour is to check the entry of alien fishes in river Yamuna and monitoring the river water in terms if water pollution can be a mile stone in conservation of life and environment as well.

In the present study recorded 19-Species belonging to 16 genera and 9 families, of which reported 4- species as Alien.

**KEYWORDS :** Yamuna River, Native fish fauna, Invasive fishes, Conservation.

### INTRODUCTION:

In India, over 300 alien fish species including 291 ornamental species, 31 aquaculture species and 3 larvicidal fishes are recorded. A total of 93 fish species classified under 73 genera, 27 families and 9 orders was reported earlier from the river where maximum diversity was encountered in the downstream stretch and least in the midstream, influenced by the water quality (A. K Singh et al. 2014).

Mathura, the north-west district of Agra division of Uttar Pradesh, lies in the basin of river Yamuna in the Ganga-Yamuna Doab. The district extends between 27° 14' to 27° 58' north latitude and 77° 17' to 78° 12' east longitude. Besides the river Yamuna which flows through the middle of the district from north to south there are a large number of small tanks and pokhras distributed throughout the district. It is divided in to 03 Tehsils, 10 blocks and 735 inhabited villages. The district suffers from chronic saline water problem along with problem of erratic rainfall. Tourism sector of the district along with trade and services are other important sectors of economy beside daily activity.

Yamuna River supports a rich diversity of fishes of commercial value. But over the years the rivers has become highly polluted. The river water is extensively used for irrigation and receives heavy load of domestic and industrial wastes. All these factors have imparted the fisheries in the river as reflected by decline in fish catch a discernible shift in fish species composition and an increase presence of invasive fish species. Domestic pollutions, Industrial pollutions, Agricultural pollutions and Sand mining are the main responsible source in declining the native fauna and making the favorable ground for invaders.

### MATERIAL AND METHODS:

Investigations on fish diversity were undertaken in river Yamuna at Mathura. Seasonal data collection during winter, summer and monsoon were done. The information on piscine diversity and composition was collected through fishes caught by the local fishers and market survey at fish landing sites along the river banks. After sampling, captured fish specimens were identified up to species level and identified with the help of standard texts (Talwar and Jhingran 1991).

### OBSERVATION:

River Yamuna today is one of the most polluted rivers in the

country. Domestic, agriculture as well as industrial pollution sources are mainly responsible for the present plight of the river. Domestic uses that pollute the river include cattle wading, bathing, open defecation and washing of clothes in the river and the offerings and remnants of religious ceremonies performed in individual houses and in public places.

Industrial pollution affects river water dissolved oxygen, pH, temperature, etc and adds heavy metals, phenolics and other organic pollutants According to CPCB (2000) there were 22 industrial units in Haryana, 42 units in Delhi and 17 units in Uttar Pradesh, which have been found to be directly discharging and polluting the river. These industries include paper, sugar, chemical, leather, distillery, pharmaceuticals, power etc. Agricultural pollution is mainly caused by agricultural residues, fertilizers and pesticides used in fields and the cattle. The river bed is extensively exploited along the stretch for sand mining. River bed and flood plains are part of an aquatic ecosystem with important ecological role of ensuring smooth river water flows, growth of requisite vegetation, ground water recharge as well as flood water regulation. Any encroachment on river bed or the flood plain resulting in a change in land use, results in hindering of one or all of the above functions.

**This data clearly indicating the decline of native fauna by two most important reasons-**

1. Pollution of river water
2. Invasion of alien species in to the river water.

### RESULTS AND DISCUSSION:

Earlier records on the fish species of the river Yamuna (Moza and Mishra, 2001; Jhingran, 1975; Khan et al., 1995; Mishra et al., 2007) recorded 70 species. Garg and Saxena (1971) recorded 48 species of fishes in Mathura district. Sharma et al. (1994) recorded 93 species in the river Yamuna. Dominance of species of the family Cyprinidae observed by some of the workers (Bhatt, 2003; Sarkar et al., 2009; Vass et al., 2011) and the present study also shows dominance of Cyprinidae. The decline of the Indian major carps was also reported.

The increasing presence of exotic fishes recorded from the river Yamuna reinforces the opinion of previous workers (Mishra et al., 2007; Vass et al., 2011) that the species are gradually establishing themselves as a breeding population replacing the Indian major carps. Observation of the risk assessment for Alien fishes in the rivers of North America also

indicated that reduced discharge alter the micro and macro habitat characters favouring the increase of non- indigenous species (Kolar and Lodge, 2002).

A preliminary record shows that 48-fish species belonging to 13-families (Garg et. al., 1971). As far as concern with the trophic utilization of fishes; carnivorous fishes were dominant followed by herbivorous and omnivorous. In my observation reported 19 species of fish species in river Yamuna at Mathura, including 4- Invasive Alien fish species (belong to 2-family) viz. *Oreochromis niloticus*, *Cyprinus carpio*, *Hypophthalmichthys molitrix* and *Clarias geripineus*. Abundance of these species is recorded due to less stressed condition which reflects the dominance in terms of biomass than any other species. It also recorded the degraded environment condition; resulting the gradual depletion of native fish species.

List of 19 -Species belonging to 16 genera and 9 families, of which reported 4- species as Invasive Alien Fishes (mark with \*).

#### Family : Notopteridae

1. *Notopterus notopterus* (Pallas)

Family : Cyprinidae

2. *Catla catla* (Ham.)

3. *Cirrhinus mrigala* (Ham.)

4. *Crossocheilus latius* (Ham.)

5. *Cyprinus carpio* Linnaeus\*

6. *Hypophthalmichthys molitrix* (Valenciennes)\*

7. *Labio gonius* (Ham.)

8. *Labeo rohita* (Ham.)

9. *Puntius sophore* (Ham.)

10. *Puntius sarana* (Ham.)

Family : Siluridae

11. *Wallago attu* (Bloch)

Family : Claridae

12. *Clarias geripineus* (Linnaeus)\*

Family : Saccobranchidae

13. *Heteropneustes fossilis* (Bloch)

Family : Bagaridae

14. *Mystus vittatus* (Ham.)

Family : Nandidae

15. *Oreochromis niloticus* (Linnaeus)\*

Family : Anabantidae

16. *Anabas testudineus* (Bloch)

Family : Ophiocephalidae

17. *Channa punctatus* (Bloch)

18. *Channa striatus* (Bloch)

19. *Channa gachua* (Hamilton)

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