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Present and past status of fish fauna of river Basantar, an important tributary of the river Ravi, in Samba district, Jammu (J&K)

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Abstract: Icthyofaunal study of river Basantar, an important tributary of river Ravi in Samba district, Jammu (J&K) has revealed the existence of 35 fish species belonging to 5 orders, 10 families and 25 genera. There is dominance of Cypriniformes (18 spp.) followed by Siluriformes (10 spp.), Perciformes (4 spp.), Synbrachiformes (2 spp.) and Osteoglossiformes (1 sps.). Present record of 35 fish species when compared with the earlier report of 59 fish species reveals a decline in fish diversity and is caused by environmental factors and anthropogenic pressure.

Keywords: Fish fauna, River Basantar, Samba

INTRODUCTION

Rivers are not only an important source of water for drinking, recreation, industry, agriculture, sewage disposal, navigation, power generation, etc. but also add considerably to country's capture fishery. Riverine fishery is fast depleting due to over-exploitation and lack of regular monitoring of water bodies for fish diversity and density. Information about fish fauna inhabiting a water body is prerequisite for development of fishery in any area. Fish is not only supplement to nutritious diet, but also is a source of income and employment generator for the skilled and unskilled workers for which there is a great demand in the present day scenario. The fishery sector contributes about 5% to the total agricultural GDP. Income is not only through the sale of fish but also by attracting the tourists. Fish are also exploited for recreation, through angling and fishkeeping, and are commonly exhibited in public aquaria. J&K Govt. earns revenue from tourists visiting Kashmir for trout fishery. Taking into consideration the importance of fish and regular monitoring of water bodies for fish diversity in lotic and lentic water bodies in the state, present survey was conducted in river Basanta, district Sambha (J&K) to know the present and past status of fish.

Topography: Basantar river, an important tributary of the river Ravi, is purely Siwalik. It originates near Kharai Dhar at an altitude of 1300 m above MSL and flows from southern slopes of Bani. The catchment area is 630 sq.km. with maximum discharge during monsoon season. The river flows through series of shallow gorges and has produced asymmetrical valleys. From it's source to Chak Chavalan, the river passes through deeply carved channel. Below Nud, the valley widens out and makes a knee bend before entering flood plains near Samba and ultimately joins the river Ravi in Pakistan.

MATERIALS AND METHODS

Besides personal collections, the fishes were obtained from different fishing centres. They were fixed in 10% formaldehyde solution and identified (Mishra, 1959; Malhotra et al., 1975; Dutta and Malhotra, 1984; Talwar and Jhingran, 1991; Day,1994 and Jayaram, 1999). Fishing methods employed in the river Basantar include cast nets, pot traps, poisoning, rod and hook and hand picking.

RESULTS AND DISCUSSION

Icthyofaunal study of river Basantar has revealed the existence of 35 fish species belonging to 5 orders, 10 families and 25 genera and the list of fishes is given below:

Superclass : Gnathostomata
Class : Actinopterygii
Subclass : Neopterygii
Division : Teleostei
Subdivision : Osteoglossomorpha
Order : Osteoglossiformes
Suborder : Notopteroidei
Family : Notopteridae
1. *Notopterus notopterus* (Pallus)
Subdivision : Euteleostei
Super order : Ostariophysi
Order : Cypriniformes
2. *Catla catla* (Ham. Buch.)
3. *Cirrihinus mrigala* (Ham. Buch.)
4. *Cirrihinus reba* (Ham. Buch.)
5. *Labeo gonius* (Ham. Buch.)
6. *Labeo rohita* (Ham. Buch.)
7. *Labeo calbasu* (Ham. Buch.)
8. *Puntius ticto* (Ham. Buch.)
9. *Puntius sophore* (Ham. Buch.)

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10. *Puntius sarana* (Ham. Buch.)
11. *Puntius chola* (Ham. Buch.)
12. *Tor tor* (Ham. Buch.)
13. *Aspidopario morar* (Ham. Buch.)
14. *Barilius vagra* (Ham. Buch.)
15. *Danio devario* (Ham. Buch.)
16. *Rasbora rasbora* (Ham. Buch.)
17. *Crossocheilus latius diplochilus* (Ham. Buch.)
18. *Garra gotyla* (Gray)

Family : Cobitidae

19. *Botia dayi* (Hora)

Order : Siluriformes
Family : Bagridae

20. *Mystus bleekeri* (Day)
21. *Mystus vittatus* (Bloch.)
22. *Aorichthys seenghala* (Sykes)
23. *Rita rita* (Ham. Buch.)

Family : Siluridae

24. *Ompak bimaculatus* (Bloch.)
25. *Wallago attu* (Schn.)

Family : Schilbeidae

26.*Clupisoma garua* (Ham. Buch.)

Family : Sisoridae

27. *Bagarius bagarius* (Ham. Buch.)
28. *Gagata cenia* (Ham. Buch.)
29. *Glyptothorax stoliczkae* (Steindachner)

Superorder : Acanthopterygii
Order : Perciformes
Family : Nandidae

30. *Badis badis* (Ham. Buch.)

Family : Channidae

31. *Channa punctatus* (Bloch.)
32. *Channa marulius* (Ham. Buch.)
33. *Channa orientalis* (Bloch. and Schn.)

Order : Synbrachiformes
Family : Mastacembelidae

34. *Mastacembelus armatus* (Lacepade)
35. *Macrognathus pancalus* (Ham.)

Commercialy important fishes occuring in river Basantar are *Tor tor, Cirrhinus mrigala, C. reba, Labeo calbasu, L. rohita, L. gonius, Aorichthys seenghala, Ompok bimaculatus, Wallago attu Bagarias bagarias and Rita rita*. Other fish species such as *Aspidopario morar, Barilius vagra, Rasbora rasbora, Puntius sophore, P. chola, P. sarana, Crossocheilus latius diplochielus, Garra gotyla, Botia dayi, Glyptothorax stoliczkae, Channa punctatus, C. orientalis, Channa marulius, Mastacemblus armatus and Macrognathus pancalus* are commonly consumed by labourers coming from Bihar, Orisa, Madhya Pradesh etc. *Channa* spp. are sold live in the market and are highly preferred by Bengalis.

Fish survey of Basantar river has revealed the dominance of Cypriniformes (18 spp.) followed by Siluriformes (10 spp.), Perciformes (4 spp.), Synbrachiformes (2 spp.) and Osteoglossiformes (1 sps.). Dominance of Cypriniformes, as seen during the present study, is in accordance with the observations of Dass and Nath (1966 and 1971); Malhotra and Jyoti (1971); Tilak (1971); Malhotra and Dutta (1975); Malhotra *et al.* (1975); Dutta and Malhotra (1984); Dutta and Kour (1999 and 2005); Dutta *et al.* (2001; 2002a and b; 2003 and 2006); Dutta (2003); Dutta and Fayaz (2003); and Kaur, S. (2006).

Fish fauna of river Basantar is rich when compared with the findings of Dutta *et al.* (2006) for other tributaries of the river Ravi viz. Ujh river (22 species belonging to 4 orders, 9 families and 20 genera); Tarnah nullah (16 species belonging to 2 orders, 4 families and 12 genera) and Kathua Khad (12 species belonging to 4 orders, 6 families and 11 genera). When compared with 30 fish species belonging to 4 orders, 8 families and 20 genera reported by Rathore (2009), fish diversity of river Basantar is more.

Fish fauna of river Basantar is more rich and diversifed as compared to the earlier observations for various lotic water bodies of other districts of Jammu. Dutta *et al.* (2002b) studied the fish fauna of the river Chenab and observed the existence of 26 fish species belonging to 3 orders, 5 families and 18 genera. Fishes belonging to order Cypriniformes (*Schizothorax richardsonii, Schizothoraichthys progastus, S. esocinus, Tor putitora, Labeo dyocheilus, L. pangusia, Garra lamta, Barilius bendelisis, Esomus danricus, Acanthocobitis botia, Noemacheilus corica, Triplophysa yasinansis*), order Siluriformes (*Eutropiichthys muris, Glyptothorax kashmirensis, G. telchitta telchitta, G. garhwali, Glyptosternum reticulatum*) and order Beloniformes (*Xenentodon cancila*), reported earlier from the river Chenab, have not been seen in river Basantar, during present study. Absence of Indian trouts viz. *Schizothorax* and *Schizoraichthys* is because of warm water conditions of river Basantar. Similarly, absence of other fishes in river Basantar (*Triplophysa, Glyptothorax kashmiriensis, G. telchitta telchitta, G. garhwali, Glyptosternum reticulatum*) is because of their preference for torrential cold water streams or cold water segments of a lotic water body.

When compared with the reports of 96 fish species belonging to 7 orders, 20 families and 52 genera by Dutta *et al.* (2003) from the river Tawi, there is paucity of fish fauna in river Basantar. There is total absence of fishes belonging to orders Cyprinodontiformes (*Gambusia affinis*) and Beloniformes (*Xenentodon cancila*). Fishes belonging to order Osteoglossiformes (*Chitala chitala*), Cypriniformes (*Salmostoma bacaila, S. punjabensis, S. gora, Barilius shacra, B. barila, B. modestus, B. bendelisis, Chela cachius, C. laubuca, Esomus danricus, Brachydanio rerio, Amplypharyndodon mola, Cyprinus carpio communis, C. carpio specularis, Tor putitora, T.*

mosal, Neolisocheilus wynadensis, N. hexastichus, Osteobrama cotio cotio, Puntins conchonius, P. terio, Labeo bata, L. boga, L. boggut, L. dero, L. dyocheilus, L. microphathalmus, L. pangusia, Schizothorax richardsonii, Garra lamta, Nemacheilus corica, Acanthocobitis botia, A. moreh, Schistura drashadi, S. prashari, S. punjabensis, S. montanus, S. rupicola, Lepidocephelus guntea), order Siluriformes *(Mystus cavasius, Pseudentropius atherinoides, Eutropiichthus murius, E. vacha, Amblyceps mongois, Glyptothorax cavia, G. garhwali, G. pectinopterus, G. punjabensis, G. telchitta telchitta and Heteropneustes fossilis*), order Synbrachiformes *(Monopterus cuchia, Macroganthus* a*ral),* order Perciformes *(Chanda nama, Parambassis ranga, Nandus nandus, Glossogobius giuris, Colisa fasciatus and Channa striatus),* reported in river Tawi, have also not been seen in river Basantar during the present study. Greater fish diversity in river Tawi is because of it's length, more catchment area, entry of cold and warm water seasonal and perennial tributaries and diversified habitat along it's length. In the upper catchment, upstream Chenani, the river has fast flow, coarse bottom and is highly suitable for cold water fishes. Downstream Udhampur, the river Tawi has well marked pools and turbulent zones and the area is suitable for the growth of diversified warm water fishes. There are a large number of tributaries viz. Ramnagar, Barmin, Dhudhar, Birhun, Udhampur nullah, Tikri nullah, Jhajjar stream, Behlol nullah Ghomanasan and Eak nullah meeting the river Tawi at various points. Moreover, a large number of springs and spring fed streams having rich diversified fauna (including fish) meet river Tawi at various places along it's length.

Present record of 35 fish species, when compared with the earlier report of 59 fish species (Dutta *et al.,* 2001a) reveals a decline in fish diversity in river Basantar. Fishes belonging to orders Cypriniformes *(Labeo bata, Osteobrama cotio cotio, Puntius conchonius, Chela cachins, Salmostoma bacaila, S. punjabensis, Amblyphanyngodon mola, Barilius bendelisis, Brachydanio rerio, Esomus danricus, Acanthocobitis botia, Lepidocephalus guntea),* Siluriformes (*Mystus cavassius, Eutropiichthys vacha, Pseeutropiusud atherinoides, Glyptothorax punjabensis, G. telchitta telchitta, Amblyceps mangois, Heteroneustes fossilis),* Beloniformes *(Xenentodon cancila),* Periformes (*Nandus nandus, Colisa fasciatus and Glossogobius giuris),* recorded earlier by Dutta *et al.* (2001a) have not been seen during the present study.

This fish decline in river Basantar is most probably caused by: 1) Wide variations in water flow during different seasons causing decline in water level and its discharge due to irregular and scanty rains in the recent times. It may be pointed out that during summer season, there is great decline in water spread and it's depth and river appears as a dry stream, 2) Soil erosion and rise in bottom causing damage to fish food organisms (benthos), fish breeding and feeding grounds. Due to deforestation in catchment and increased soil erosion, widely scattered pools once existing along the river have disappeared and river has become quite shallow, 3) Damage to fish breeding and feeding grounds due to collection of stones and sand for construction purposes. River Basantar is an important source of raw materials for construction not only in Samba, Vijaypur etc. but also in Jammu city,4)Increased fishing pressure due to unemployment and use of small mesh sized fishing methods,5)Fishing during breeding season. In the river Basantar, there is upstream migration of *Labeo spp., Cirrhinus spp., Bagarias spp.* and *Rita spp.* etc. for breeding during monsoon season. Due to increased weight and sluggish movements, these matured fishes are easily collected by fishermen. Intensive fishing during this season results in loss of future fish stock and should be banned, 6) Illegal fishing methods viz. poisoning, grenading and dynamitting. These fishing methods are not only causing damage to adult fishes, but even fish larvae and fish food organisms are killed.

Through management practices such as plantation in catchment, construction of pools along the river, ban on illegal fishing methods and fishing during breeding season, diversity and density of fishes in the river Basantar can be increased.

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