



Fish Diversity in the selected streams of Doon Valley, Dehradun, Uttarakhand (India)

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Abstract

The fish fauna of Doon Valley was studied for a period of one year Jan. 2021 to Dec. 2021. Ten families belonging to 50 species were collected from various sampling stations set on Song river, Dulhani river, Suswa river, Baldi river in East and Tons and Asan river in the West. Family Cyprinidae was the most dominant family contributing 52% (26 species) to the fish diversity in the selected streams of Doon Valley, followed by Family Cobitidae 16% (8 species), Family Bagridae, Sisoridae, Channidae and Osphronemidae 6% (3 species of each family) and Family Belonidae, Mastacembelidae, Clariidae and Heteropneustidae 2% (1 species of each family).

Keywords: Fish diversity, Doon Valley, streams

Introduction

In the early or mid 19th century the information of fish taxonomy was meagre. The consolidated efforts of Hamilton (1822), Day (1871) to study the fish fauna of river Ganges in British India, Ceylon and Burma including hill stream fishes of Doon Valley was attempted by Hora and Mukerjee (1996), Lal and Chatterjee (1962), Singh (1964), Gover (1971), Tilak and Hussan (1973), Grover et al. (1994), Uniyal et al. (2002).

Rauthan et al. (2015) and Rana et al. (2017) who contributed only in giving systematic list of some fishes. Present investigation were thus started due to the fact that Ichthyofauna of any region is dynamic in nature and what obtained yesterday was not be available today. The alternation in the nature of water bodies, introduction of exotic species by man rapid changes in the ecological conditions all conduct to marked changes in the freshwater ecosystem and thus effect the fish diversity.

Materials and Methods

The Doon Valley is an unusually wide, long valley within the Shivalik hills in the lower Himalayas in state of Uttarakhand and Himachal Pradesh. Within the valley lies the city of Dehradun, the capital of Uttarakhand state. The Doon Valley lies between two intermediate ranges of the Himalaya. It is bounded on cell rides by mountains with one range running from the West to East (with Mussoorie in the centre) in a semi-circular arc and one running at the South from Poanta Sahib to Haridwar. The valley also forms a watershed between the Yamuna and Ganges river system. The Song river is a river in Dehradun district that drain the central and eastern part of the Doon Valley. It originates as spring fed stream in the Southern slopes of Mussoorie ridge of the Himalayan range and runs from Dhanaulti towards Nardendra Nagar. As is common in hilly areas there are several streams running South from the mountain that merge into the river that emerges from the hills after Sahastradhara. Song is one of

the largest river that drain the Doon Valley and its tributaries includes Kali Gad, Sahastradhara, Rispana, Dulhani and Suswa. The river chain flows through the forest of Chilla before its confluence with Ganga river at Raiwala.

Fish Sampling and Analysis

Fishes were collected with the help of local fisherman using different types of nets namely, gill nets, cast net, drag nets immediately. Photographs were taken with the help of digital camera. Fishes brought to laboratory and preserved in jars according to the size of species. Small fishes were directly placed in the 8% formalin solution while large fishes were given an incision in their abdomen and preserved. The meristic and morpho-metric characters were measured and identified up to the species level with the help of standard keys and books (Day 1889, Talwar and Jhingran 1991, Jayaram, 1989).

The fish fauna is an important aspect of fishery potential of a water body. Fish is one of the important components of the aquatic ecosystem and it also forms food for a variety of animals and human being. In the present study a total 50 species of fishes belong to 10 families were reported. The cyprinidae was dominant with 26 species followed by Cobitidae 8 species; Family Sisoridae 3 species; Bagridae 3 species; Channidae 3 species and Osphronemidae 3 species respectively. Song river has a rich fish fauna, however, some species found in this region has started disappearing there is need to contemplate measures to protect the fish genetic resources. The main threat for the decline of various fish fauna may be due to over fishing of Juveniles industrialization, urbanization and destruction of natural environment. The evaluation of fish diversity resources found in streams of Dehradun reveals that there are 50 species of fishes belonging to 9 families were depicted in Table 1.

1. Family : Cyprinidae, Subfamily : Danionidae

Among the Cyprinidae, there are 5 species of *Barilius* and 5 species of *Puntius*; 2 species of *Tor*, *Garra*, *Labeo*; one species of *Crossocheilus*, *Chagunius*, *Danio*, *Devario*, *Esomus*, *Rasbora*.

(1) Genus *Barilius* (Hamilton)

The species of *Barilius* reaches length of 22.7 cm and is characterized by dark blue bars on the body; an elongated and compressed body and a dorsal fin inserted posterior to the mid length of body. *Barilius* inhabit the placid - eurythermal waters of streams like Song, Dulhani, Suswa, Baldi, Asan and Tons. The species recorded are – *Barilius bendelisis* (Hamilton), *Barilius bola* (*Raiamas bola*) Hamilton, *Barilius barna* (Hamilton), *Barilius vagra* (Hamilton) and *Barilius tileo* (Hamilton). These minor carps in shallow waters of spring-fed rivers. They are omnivorous and prefer clear streams (Badola and Singh, 1980). *Raiamas bola* is called Indian hill trout. It is the game fish of the Himalayan, growing up to 30 cm in length. However, its population is now steadily declining and is in the endangered list.

(2) Genus *Puntius* (Family : Cyprinidae, Subfamily : Cyprininae)

Five species of *Puntius* recorded in streams of Dehradun. These are *Puntius chola* (Hamilton), *Puntius ticto* (Hamilton), *Puntius conchoni* (Hamilton), *Puntius sarana* (Hamilton) and *Puntis terio* (Hamilton). Adult size, small, not greater than 120 mm. Maxillar barbel may be absent or present. No rostral barbel, the pool barb is a tropical fresh water belong to the *Puntius* genus in the family Cyprinidae. It is native to inland waters in Asia and is found in India, Nepal, Bangladesh, Pakistan etc.

(3) Genus *Tor* (Family : Cyprinidae, Subfamily : Cyprininae)

Commonly known as Mahseer, the genus *Tor* is best represented by *Tor putitora* and *Tor tor*. Both species are recorded in Dehradun streams. The Mahseer is considered as the most valuable game fish of India. The native name "Mahasaula" and *Tora* probably refer to the large size of the scales or head. The *Putitora mahseer* or yellow fin mahseer occurs all along the base of Shivalik hills including India, Pakistan and Bangladesh. The length of the head is considerably greater than the depth of the body. The number of scales along lateral line may be 23-28. *Tor tor* occurs in foothills of the Eastern and Central Himalaya. In

the so-called for Mahseer or red fin Mahseer. The head is invariably shorter than the depth of the body. There are 28-29 scales along the lateral line.

(4) **Genus *Gara* (Family : Cyprinidae, Subfamily : Cyprininae)**

Garra gotyla gotyla (Gray) and *Garra lamta* (Hamilton) commonly occurs in the streams of Doon Valley. The most common species is *Garra gotyla gotyla*; sucker head common name, is found in turbid hill streams of Doon Valley and Central Himalaya. The presence of an adhesive apparatus in the ventral side of the head and thorax enables the fish to live in rivers of Doon Valley

(5) **Genus *Schizothorax* (Family : Cyprinidae, Subfamily : Barbinae)**

The genera *Schizothorax* and *Schizothoraichthys* are commonly referred to as *Schizothoracids*. The species of *Schizothorax richardsonii* (Gray) and *Schizothoraichthys progastus* (McClelland) commonly found in Doon Valley streams. These species are fairly well adapted for torrents and thus distributed throughout the rivers.

(6) **Genus *Crossocheilus* (Family : Cyprinidae, Subfamily : Cyprininae)**

The genus *Crossocheilus* occur only in one species *Crossocheilus latius latius* (Hamilton) in streams of Doon Valley and common in the foothills of Central Himalayas. *C. latius latius* is a column feeder, herbivorous fish, characterized by 34-36 scales along lateral line and horny tubercles on the snout and cheeks in the male.

(7) **Genus *Labeo* (Family : Cyprinidae, Subfamily : Cyprininae)**

Labeo dero (Hamilton) and *Labeo dyocheilus* (McClelland) are common species occurs in Doon Valley and foothills of Central Himalayas.

(8) **Genus *Danio* (Family : Cyprinidae, Subfamily : Danioninae)**

The *Danio rerio* (Hamilton), the Zebra fish is a fresh water fish belonging to the minnow family of order Cypriniformes. Native of South Asia. It is a popular aquarium fish, frequently sold under the trade name Zebra danio. *Danio rerio* is native to inland streams and commonly found in Song, Asan, Dulhani, Tons and Suswa rivers in Dehradun.

(9) **Genus *Devario devario* (Family : Cyprinidae, Subfamily : Danioninae)**

Devario is a genus of fish in the family Cyprinidae native to the rivers and streams of Doon Valley. Adults inhabit streams, ponds and beels. Occurs in slow moving to stagnant standing water bodies.

(10) **Genus *Rasbora* (Family : Cyprinidae, Subfamily : Danioninae)**

The black line *Rasbora daniconius* (Hamilton) or slender rasbora is a species of ray-finned fish in the genus Cyprinidae family. It is found in the rivers of Doon Valley.

(11) **Genus *Esomas* (Family : Cyprinidae, Subfamily : Danioninae)**

The Indian flying barb, *Esomas danricus* (Hamilton) historically flying barb is one of the species known in the group of flying barbs owing to their extremely long barbels. Adults occur in ponds, irrigation canals and slow moving streams commonly found in Doon Valley.

2. **Family : Cobitidae**

Eight species of cobitidae family found in water bodies of Dehradun district. These are *Lepidocephalichthys guntea*, *L. annandaleii*, *Botia dario*, *Noemacheilus botia*, *N. montanus*, *N. rupicola*, *N. bevani* and *N. savona*

(12) **Genus *Lepidocephalichthys***

The two species of *Lepidocephalichthys guntea* (Hamilton) and *L. annandaleii* (Chaudhari) are found in rivers of Doon Valley. Commonly known as Loach or Scavenger loach is a species of Cobitid loach, native to southern and south-eastern Asia.

(13) **Genus *Botia***

Botia dario (Hamilton) is a good fish to have in tropical aquarium, quickly taking care of pest snail populations. They get as long as 15.0 cm and are commonly kept in groups of 4 or more. They are omnivores. Members are characterized by colour pattern consisting of base yellow to golden colour with 7-8 blue, green, grey, black body bars. It is found in rivers of Dehradun District.

(14) **Genus *Noemacheilus***

No other genera finds a wider representation than the genus *Noemacheilus*. Five species were recorded. *Noemacheilus botia* (Hamilton), *N. montanus* (McClelland), *N. rupicola* (McClelland), *N. bevani* (McClelland) and *N. savona* (Hamilton) in Doon valley.

3. **Family : Bagridae**

There are four species – *Mystus cavasius* (Hamilton), *M. bleekeri* (Day), *M. vittatus* (Bloch.) and *M. tengara* (Hamilton) were recorded in water bodies of Doon Valley.

4. **Family : Belonidae**

Also described by names such as *Esos cancila* and *Belone cancila*, *Xenentodon cancila* (Hamilton) inhabits some foot hill streams of Doon Valley.

5. **Family Sisoridae**

Genus *Glyptothorax* were recorded three species in Doon Valley – *Glyptothorax pectinopterus* (McClelland), *G. cavia* (Hamilton) and *G. telchitta* (Hamilton). These are occurs in hill streams, bottom dwelling, carnivorous fish, the adhesive apparatus is highly developed.

6. **Family : Mastacembelidae**

Only one species of *Mastacembalus armatus* (Lacepede) has been reported from Song, Tons, Asan and Suswa rivers of Doon Valley.

7. **Family : Channidae**

Only three species *Channa gachua* (Hamilton), *C. punctatus* and *C. marulius* (Hamilton) has been reported in Doon Valley.

8. **Family : Clariidae**

Only one species of *Clarias batrachus* (Linnaeus) was recorded in Doon valley water bodies. *Clarias batrachus* has a broad, flat head and elongate body which tapers toward the tail.

9. **Family : Osphronemidae**

Genus *Colisa* three species – *Colisa fasciatus* (Bloch and Schneider), *C. latius* and *C. labiosus* (Day) has been recorded in rivers of Doon Valley.

10. **Family : Heteropneustidae**

The Asian stinging cat fish of fossil is a species of ovisac cat fish found in rivers of Doon Valley. *H. fossilis* is found mainly in ditches, swamps and marshes but occurs in muddy rivers.

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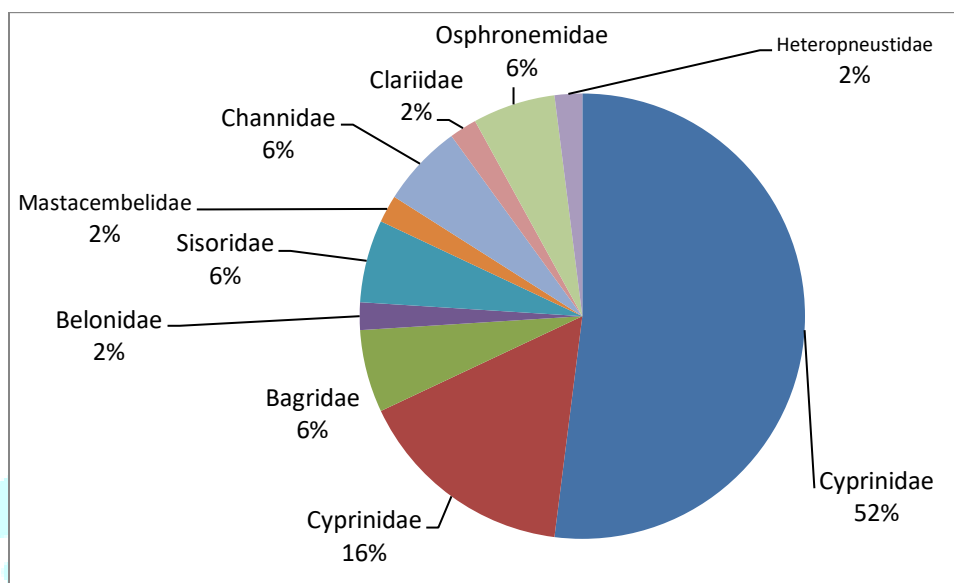


Fig. 1 : Percentage Occurrence of Fish Families of Doon Valley

Table 1 : Fish Diversity in the Selected Streams

S. No.	Family	Song river	Dulhani river	Suswa river	Baldi river	Tons river	Asan river	Local name
[1]	Cyprinidae							
1.	<i>Schizothorax richardsonii</i> (Gray)	+	-	+	+	+	+	Asela
2.	<i>Schizothorachthys progastus</i> (McClelland)	+	-	-	-	+	+	Dinnawa
3.	<i>Tor tor</i> (Hamilton)	+	+	-	-	+	+	Lal machiyan
4.	<i>Tor putitora</i> (Hamilton)	+	+	-	-	+	+	Pila machiyan
5.	<i>Labeo dero</i> (Hamilton)	+	+	+	+	+	+	Kala bans
6.	<i>Labeo dyocheilus</i> (McClelland)	+	+	+	+	+	+	Boalla
7.	<i>Labeo pangusia</i> (Hamilton)	+	+	+	+	+	+	Gulabi Pankh
8.	<i>Puntius sophore</i> (Hamilton)	+	+	+	+	+	+	
9.	<i>Puntius chola</i> (Hamilton)	+	+	+	+	+	+	Katch
10.	<i>Puntius ticto</i> (Hamilton)	+	+	+	+	+	+	
11.	<i>Puntius conchoni</i> (Hamilton)	+	+	+	+	-	+	Puti
12.	<i>Puntius sarana</i> (Hamilton)	+	+	+	+	+	+	Puti
13.	<i>Puntis terio</i> (Hamilton)	+	+	+	+	+	+	Bhuri
14.	<i>Garra lamta</i> (Hamilton)	+	+	+	+	-	+	
15.	<i>Garra gotyla gotyla</i> (Gray)	+	+	+	-	+	+	Dhanura
16.	<i>Crossocheilus latius latius</i> (Hamilton)	+	-	+	+	+	+	Dhanura
17.	<i>Changunius changunius</i> (Hamilton)	+	+	+	+	+	+	
18.	<i>Barilius bendelisis</i> (Hamilton)	+	+	+	+	+	+	Chedra
19.	<i>Barilius bola</i> (Hamilton)	+	+	+	+	+	+	Bhola
20.	<i>Barilius barna</i> (Hamilton)	+	+	+	+	+	+	Dhaur
21.	<i>Barilius vagra</i> (Hamilton)	+	-	-	-	+	+	Popta
22.	<i>Barilius tilco</i> (Hamilton)	-	+	+	+	+	+	Chilwa
23.	<i>Danio rerio</i> (Hamilton)	+	-	+	-	+	+	Patukari
24.	<i>Devario devario</i> (Hamilton)	+	+	+	+	+	+	Dharidar
25.	<i>Esomus danricus</i> (Hamilton)	+	+	+	+	+	+	Chal
26.	<i>Rasbora daniconius</i> (Hamilton)	+	-	+	+	+	+	Bhuri
[2]	Cobitidae							

27.	<i>Lepidocephalichthys guntea</i> (Hamilton)	+	-	+	-	+	+	Ghiwi
28.	<i>Lepidocephalichthys annandalei</i> (Chaudhari)	+	-	+	-	+	+	Gadera
29.	<i>Botia dario</i> (Hamilton)	+	+	+	-	+	+	Gold Fish
30.	<i>Noemacheilus botia</i> (Hamilton)	+	+	+	+	+	+	
31.	<i>Noemacheilus montanus</i> (McClelland)	+	+	+	+	+	+	
32.	<i>Noemacheilus rupicola</i> (McClelland)	+	+	+	+	+	+	Gadiyal
33.	<i>Noemacheilus bevani</i> (McClelland)	+	+	+	+	+	+	Souna
34.	<i>Noemacheilus savona</i> (Hamilton)	+	+	+	+	+	+	Gadera
[3]	Bagridae							
35.	<i>Mystus vittatus</i> (Bloch.)	+	+	+	-	+	+	
36.	<i>Mystus tengara</i> (Hamilton)	+	+	+	-	+	+	Kater
37.	<i>Mystus bleekeri</i> (Day)	+	+	+	-	+	+	Kater
[4]	Belonidae							
38.	<i>Xenentodon cancila</i> (Bloch.)	+	+	+	+	+	+	Suwa
[5]	Sisoridae							
39.	<i>Glyptothorax pectinopterus</i> (McClelland)	+	+	-	-	+	+	Pathar Chatti
40.	<i>Glyptothorax cavia</i> (Hamilton)	+	+	+	-	+	+	Pathar Chatti
41.	<i>Glyptothorax telchitta</i> (Hamilton)	+	+	+	+	+	+	Sipliya
[6]	Mastacembelidae							
42.	<i>Mastacembalus armatus</i> (Lacepede)	+	+	+	+	+	+	
[7]	Channidae							
43.	<i>Channa punctatus</i> (Bloch.)	+	+	+	+	+	+	Sauli
44.	<i>Channa gachua</i> (Hamilton)	+	+	+	+	+	+	Sowar
45.	<i>Channa marulius</i> (Hamilton)	+	+	+	+	+	+	Sowar
[8]	Clariidae							
46.	<i>Clarias batrachus</i> (Linnaeus)	-	-	+	+	-	+	Magur
[9]	Osphronemidae							
47.	<i>Colisa fasciatus</i> (Bloch and Schneider)	+	+	+	+	+	+	Sunera
48.	<i>Colisa latius</i> (Hamilton)	+	-	+	+	+	+	Gourami
49.	<i>Colisa labiosus</i> (Day)	+	+	+	+	+	+	Gourami
[10]	Heteropneustidae							
50.	<i>Heteropneustes fossilis</i> (Bloch)	+	+	+	+	+	+	Suighi

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