



Survey and systematic analysis of Fish fauna of erstwhile Udhampur District, Jammu region, with new records of *Barilius radiolatus* Gunther, *Botia lohachata* Chaudhari, *Botia dario* (Ham. Buch.) and *Glyptothorax punjabensis* Mirza and Kashmiri

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Abstract

Ichthyofaunistic survey in lotic and lentic water bodies of erstwhile Udhampur District, Jammu region, has revealed the presence of 76 fish species belonging to 6 orders, 14 families and 45 genera. *Glyptothorax punjabensis* Mirza and Kashmiri is the new record for country. *Barilius radiolatus* Gunther, *Botia lohachata* Chaudhari *Botia dario* (Ham. Buch.) are the new records for the state. The list also includes *Catla catla*, *Laheo rohita*, *Ctenopharyngodon idellus*, *Hypthalmichthys molitrix*, *Cyprinus carpio communis*, *Cyprinus carpio specularis* and *Salmo trutta fario* stocked by the state fishery department in the district. There is dominance of Cypriniformes (51 species), followed by Siluriformes (18 species), Perciformes (3 species) *Synbranchiformes* (2 species), and *Beloniformes* and *Salmoniformes* (1 species each). Fishing methods commonly employed are enlisted. Various causes of fish decline and their conservation measures in the district have also been described.

Keywords: Fish fauna, fishing methods, conservation measures, lotic and lentic water bodies, Udhampur district

Introduction

Knowledge of fish resources is prerequisite for exploitation and rational management of fishery of an area. Fish fauna of various lotic and lentic water bodies of Jammu region has earlier been described by Das and Nath (1965, 1966 and 1971), Malhotra and Jyoti (1971), Malhotra *et al.* (1975), Malhotra and Dutta (1976), Tilak (1971), Sharma and Sharma (1973 and 1974), Joshi *et al.* (1978), Jyoti and Gupta (1978), Dutta (2003 and 2012), Dutta and Malhotra (1984), Dutta and Kour (1999, 2005 and 2006), Dutta and Fayaz (2003), Dutta *et al.* (2001 a, 2002 a, b, 2003 and 2006) and Sharma and Dutta (2012). However, there is no detailed information about the fish fauna of various water bodies of erstwhile Udhampur district and has been described. The information shall be of great help to the state fishery department to undertake fish stocking programmes in various water bodies and to the fish biologists.

Topography of Erstwhile Udhampur District

Erstwhile district Udhampur was the fifth largest

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district of J and K state and had an area of 431000 hectares. It lies between 74° 50' east longitude and 30° 8' north latitude. The district is situated in the south eastern part of the J and K state. It is bounded in the west by Rajouri district, in the northeast by Doda district, in the southeast by Kathua district and in the southwest by Jammu district. Situated amidst the high mountains, district Udhampur has huge forest covers and varied topographical and climatic conditions. Patnitop and upper reaches of Ramnagar, Panchari etc. receive snowfall during winter. There are good number of springs widely distributed in the district and are an important perennial source of water for lotic water bodies. The river Chenab draining Jammu region also passes through this district. A good number of cold and warm water torrential and sluggish streams are widely distributed in the district. The main drainage of the district is by river Tawi.

Material and Methods

Fishing methods commonly employed include rod and hook, cast net, pot traps, basket traps, gill nets, dynamiting and grenading, hand picking, electric shocking, poisoning, covering stones with cast net,



mosquito nets, simple cloth and have been described earlier by Dutta et al. (2001 a). Field collected fishes were examined for their colour pattern, preserved in 10% formaldehyde solution and identified (Hamilton, 1822; Misra, 1962; Dutta and Malhotra, 1984; Talwar and Jhingran, 1991; Day, 1994 and Jayaram, 1999). For the systematic arrangement of the reported fish species,

classification followed by Jayaram (1999) has been referred.

Results and Discussion

An upto date list of fishes inhabiting some lotic & lentic waters of Udhampur District of Jammu region.

		RC	AN	BS	TN	RT	ML	FP
Superclass	: Gnathostomata							
Class	: Actinopterygii							
Sub class	: Neopterygii							
Division	: Teleostei							
Subdivision	: Euteleosostei							
Superorder	: Ostariophysi							
Order	: Cypriniformes							
Family	: Cyprinidae							
Subfamily	: Leuciscinae							
Genus	: <i>Hypothalmichthys</i> Bleeker							
	1. <i>H. molitrix</i> (Valenciennes)	-	-	-	-	-	-	+
Subfamily	Danioninae (=Rasborinae)							
Genus	: <i>Salmostoma</i> (Swainson)							
	2. <i>S. bacaila</i> (Hamilton-Buchanan)	-	-	-	-	+	-	-
	: <i>Aspidoparia</i> Heckel							
	3. <i>A. morar</i> (Hamilton-Buchanan)	-	-	-	-	+	-	-
Genus	<i>Barilius</i> Hamilton-Buchanan							
	4. <i>B. vagra vagra</i> (Hamilton-Buchanan)	+	+	-	-	+	-	-
	5. <i>B. bendelisis</i> (Hamilton-Buchanan)	+	+	-	-	+	-	-
	6. <i>B. shacra</i> (Hamilton-Buchanan)	-	-	-	-	+	-	-
	7. <i>B. modestus</i> Day	-	-	-	-	+	-	-
	8. <i>B. radiolatus</i> Gunther	-	-	-	-	+	-	-
Genus	: <i>Esomus</i> Swainson							
	9. <i>Esomus danricus</i> (Hamilton-Buchanan.)	-	-	-	+	-	+	-
Genus	<i>Danio</i> Hamilton-Buchanan.							
	10. <i>D. devario</i> (Hamilton-Buchanan.)	-	-	-	+	+	-	-
Genus	<i>Brachydanio</i> Weber and Beaufort							
	11. <i>B. rerio</i> (Hamilton-Buchanan)	-	-	-	+	-	+	-
Genus	<i>Rasbora</i> Bleeker							
	12. <i>R. rasbora</i> (Hamilton-Buchanan)	-	-	-	+	-	+	-



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Genus	<i>Amblypharyngodon</i> Bleeker							
	13. <i>A. mola</i> (Hamilton-Buchanan.)	-	-	-	-	+	-	-
Subfamily	Cyprininae							
Genus	<i>Ctenopharyngodon</i> Steindachner							
Genus	14. <i>C. idellus</i> (Valenciennes)	-	-	-	-	-	-	+
	<i>Cyprinus</i> Linnaeus							
	15. <i>C. carpio communis</i> Linnaeus	-	-	-	-	-	+	+
	16. <i>C. carpio specularis</i> Lacepede	-	-	-	-	-	+	+
Genus	<i>Tor</i> Gray							
	17. <i>T. tor</i> (Hamilton-Buchanan)	+	+	-	-	+	-	-
	18. <i>T. putitora</i> (Hamilton-Buchanan.)	+	+	-	-	+	-	-
Genus	<i>Catla</i> Valenciennes							
	19. <i>Catla catla</i> (Hamilton-Buchanan.)	-	-	-	-	-	-	+
Genus	<i>Osteobrama</i> Heckel							
	20. <i>O. cotio cotio</i> (Hamilton-Buchanan)	-	-	-	+	+	-	-
Genus	<i>Puntius</i> Ham.- Buch.							
	21. <i>P. sarana sarana</i> (Hamilton-Buchanan.)	-	-	-	+	+	-	-
	22. <i>P. conchonius</i> (Hamilton-Buchanan)	-	-	-	+	+	+	-
	23. <i>P. terio</i> (Hamilton-Buchanan)	-	-	-	+	+	+	-
	24. <i>P. ticto</i> (Hamilton-Buchanan)	-	-	-	+	+	+	-
	25. <i>P. chola</i> (Hamilton-Buchanan)	-	-	-	+	+	-	-
	26. <i>P. sophore</i> (Ham. Buch.)	-	-	-	+	+	+	-
Genus	<i>Cirrhinus</i> Cuvier							
	27. <i>C. mrigala</i> (Hamilton-Buchanan)	-	-	-	-	+	-	+
	28. <i>C. reba</i> (Hamilton-Buchanan)	+	+	-	-	+	-	-
Genus	<i>Labeo</i> Cuvier							
	29. <i>L. bata</i> (Hamilton-Buchanan.)	-	-	-	-	+	-	-
	30. <i>L. calbasu</i> (Hamilton-Buchanan.)	-	-	-	+	+	-	-
	31. <i>L. dero</i> (Hamilton-Buchanan.)	-	-	-	+	+	-	-
	32. <i>L. dyocheilus dyocheilus</i> (Mc.Clelland.)	-	-	-	-	+	-	-
	33. <i>L. pangusia</i> (Hamilton-Buchanan)	-	-	-	-	+	-	-
	34. <i>L. rohita</i> (Hamilton-Buchanan)	-	-	-	-	+	-	+
Subfamily	Oreininnae (= Schizothoracinae)							
Genus	<i>Schizothorax</i> Heckel							
	35. <i>S. richardsonii</i> (Gray)	+	+	+	-	+	-	-
Genus	<i>Schizothorichthys</i> Misra							
	36. <i>S. progastus</i> (Mc.Clelland)	+	-	-	-	-	-	-
	37. <i>S. esocinus</i> (Heckel)	+	-	-	-	-	-	-
	38. <i>S. curvifrons</i> (Heckel)	+	-	-	-	-	-	-



Subfamily	Garrinae							
Genus	<i>Crossoscheilus</i>							
	Kuhl and van Hasselt							
	39. <i>C. latius diplocheilus</i> (Heckel)	+	+	-	-	+	-	-
Genus	<i>Garra</i> Hamilton-Buchanan.							
	40. <i>G. gotyla gotyla</i> (Gray)	+	+	-	-	+	-	-
	41. <i>G. lamta</i> (Hamilton-Buchanan)	+	+	-	-	+	-	-
Family	Balitoridae							
Subfamily	Nemacheilinae							
Genus	<i>Nemacheilus</i> Bleeker							
	42. <i>N. corica</i> (Hamilton-Buchanan.)	+	-	-	-	-	-	-
Genus	<i>Acanthocobitis</i> Peter							
	43. <i>A. botia</i> (Hamilton-Buchanan.)	-	-	-	+	+	-	-
Genus	<i>Schistura</i> McClelland							
	44. <i>S. punjabensis</i> (Hora)	-	-	-	-	+	-	-
	45. <i>S. montanus</i> (McClell)	+	-	-	-	-	-	-
Genus	<i>Triplophysa</i> Rendahl.							
	46. <i>T. yasinensis</i> (Alcock)	+	-	-	-	-	-	-
Family	Cobitidae							
Subfamily	Botinae							
Genus	<i>Botia</i> Gray							
	47. <i>B. almorhae</i> Gray	+	+	-	-	+	-	-
	48. <i>B. birdi</i> Chaudhuri	+	+	-	-	+	-	-
	49. <i>B. lohachata</i> Chandhari	-	-	-	-	+	-	-
	50. <i>B. dario</i> (Hamilton-Buchanan)	-	-	-	-	+	-	-
Subfamily	Cobitinae							
Genus	<i>Lepidocephalus</i> Bleeker							
	51. <i>L. guntea</i> (Hamilton-Buchanan.)	-	-	-	+	+	-	-
Order	Siluriformes							
Family	Bagridae							
Subfamily	Bagrinae							
Genus	<i>Mystus</i> Scopoli							
	52. <i>M. bleekeri</i> (Day)	-	-	-	+	+	-	-
	53. <i>M. cavasius</i>	-	-	-	+	+	-	-
	(Hamilton-Buchanan)							
	54. <i>M. vittatus</i> (Bloch.)	-	-	-	+	+	-	-
Genus	<i>Aorichthys</i> Wu							
	55. <i>A. seenghala</i> (Sykes)	-	-	-	-	+	-	-
Family	Siluridae							
Genus	<i>Ompok</i> Lacepede							
	56. <i>O. bimaculatus</i> (Bloch.)	-	-	-	+	+	-	-
	57. <i>O. pabda</i> (Ham. Buch.)	-	-	-	-	+	-	-
Genus	<i>Wallago</i> Bleeker							



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	58. <i>W. attu</i> (Bloch and Schneider)	-	-	-	-	+	-	-
Family	Schilbeidae							
Subfamily	Schilbeinae							
Genus	<i>Eutropiichthys</i> Bleeker							
	59. <i>E. vacha</i> (Hamilton-Buchanan.)	-	-	-	-	+	-	-
Family	Amblycipitidae							
Genus	<i>Amblyceps</i> Blyth							
	60. <i>A. mangois</i> (Ham. Buch.)	-	-	-	-	+	-	-
Family	Sisoridae							
Genus	<i>Bagarius</i> Bleeker							
	61. <i>B. bagarius</i> (Hamilton-Buchanan)	+	+	-	-	+	-	-
Genus	<i>Glyptosternon</i> McClelland							
	62. <i>G. reticulatum</i> McClelland	+	-	-	-	-	-	-
Genus	<i>Glyptothorax</i> Blyth							
	63. <i>G. pectinopterus</i> (Mc.Clelland)	+	-	-	-	+	-	-
	64. <i>G. indicus</i> (Talwar)	-	-	-	-	+	-	-
	65. <i>G. telchitta telchitta</i> (Hamilton-Buchanan)	+	+	-	-	+	-	-
	66. <i>G. cavia</i> (Hamilton-Buchanan)	-	-	-	-	+	-	-
	67. <i>G. Kashmirensis</i> Hora	+	+	-	-	-	-	-
	68. <i>G. punjabensis</i> Mirza & Kashmiri	+	-	-	-	+	-	-
Family	<i>Heteropneustidae</i>							
Genus	<i>Heteropneustes</i> Muller							
	69. <i>H. fossilis</i> (Bloch.)	-	-	-	+	+	+	-
Superorder	Acanthopterygii							
Order	Beloniformes							
Suborder	Belonoidei (= Exocoetoidei)							
Family	Belonidae							
Genus	<i>Xenentodon</i> Regan							
	70. <i>X. cancila</i> (Hamilton-Buchanan)	-	-	-	+	-	-	-
Order	Synbranchiformes							
Suborder	Mastacembeloidei							
Family	Mastacembelidae							
Subfamily	Mastacembelinae							
Genus	<i>Macroganthus</i> Lacepede							
	71. <i>M. pancalus</i> Hamilton-Buchanan	-	-	-	-	+	-	-
Genus	<i>Mastacembelus</i> Scopoli							
	72. <i>M. armatus</i> (Lac.)	-	+	-	+	+	-	-



Order	Perciformes							
Suborder	Acanthouroide							
Family	Belontiidae							
Subfamily	Trichogasterinae							
Genus	<i>Colisa</i> Cuvier							
	73. <i>Colisa fasciatus</i> (Schn.)	-	-	-	-	-	+	-
Suborder	Channoidei							
Family	Channidae							
Genus	<i>Channa</i> Scopoli							
	74. <i>C. orientalis</i> Bloch. and Schn.	-	-	-	+	+	+	-
	75. <i>C. punctatus</i> (Bloch.)	-	-	-	+	+	+	-
Superorder	Protacanthopterygii							
Order	Salmoniformes							
Family	Salmonidae							
Genus	<i>Salmo</i> Linneaus							
	76. <i>Salmo trutta fario</i> * Linn.	-	-	-	-	+	-	-

* Stocked and reported from Dudu, Basantgarh area by the state fisheries department.

RC = River Chenab

AN = Aans Nullah (Thakrakot area, Reasi)

BS = Banganga Stream and its tributaries

TN = Tikkiri Nullah (Due to road widening there is reduction in depth and width and fish fauna is almost absent)

RT = River Tawi and its tributaries.

ML = Mansar Lake (only *Cyprinus corpio specularis* and *Cyprinus corpio communis* are observed at present)

FP = Fish Ponds

Barilius radiolatus, *Botia lohachata*, *Botia dario* are new record from Jammu region. Johal and Tandon (1979) reported the *Barilius radiolates* from Sultanpur and *Biota lohachata* from Desua and Ferozpur, Punjab. *Biota dorio* has earlier been reported from Punjab by Jayaram (1999). *Glyptothorax punjabensis* is the new record for India. Earlier, it is known from Pakistan (Talwar and Jhingran, 1991 and Jayaram, 1999). Among various lotic water bodies, in erstwhile Udhampur district, maximum fish diversity is noticed in river Tawi (56 spp) followed by Tikkiri nullah (24 spp), the river Chenab (23 spp), Aans nullah (15 spp) and Banganga stream and its tributaries (1 spp). Variable water flow viz mostly torrential upstream Chenani and turbulent downstream, presence of large number of pools along its length and entry of large number of clean water tributaries at various places may account for rich fish diversity in river Tawi. Presence of large number of spring water fed pools

and rich macrophytic and phytoplanktonic diversity in Tikkiri nullah may account for its moderate fish diversity. Torrential flow cold water, absence of pools and poor diversity of fish food organisms may explain low fish diversity in the river Chenab. Fish fauna of Udhampur district, comprising of 76 species is dominated by Cypriniformes (51 species), followed by Siluriformes (18 species), Perciformes (3 species), Synbranchiformes (2 species), Salmoniformes and Beloniformes (1 species each). Dominance of Cypriniformes and sub dominance of *Siluriformes* has also earlier been reported from Poonch district (Das and Nath, 1965 and Dutta, 2003), Rajouri district (Sharma and Sharma, 1973 Dutta *et al.* 2002a), the River Chenab (Dutta, 2012 and Dutta *et al.* 2002 b), River Tawi (Dutta *et al.* 2003), Jammu district (Dutta and Kour, 2006), Basantar river (Dutta *et al.* 2001a and Sharma and Dutta, 2012), various tributaries of the river Ravi in Kathua district (Dutta *et al.* 2006), Kathua district (Dutta and Kour, 2005b) and Doda



district (Dutta and Fayaz, 2003). Fish fauna of Udhampur district is more diversified in comparison to forty fish species reported by Dutta (2003) from Poonch district, 30 fishes enlisted by Dutta and Fayaz (2001) from Doda district, 32 fish species reported by Dutta et al (2002) from the Rajouri district. This may be attributed to turbulent and torrential flow of river Tawi, presence of large number of pools, along its length, and entry of large number of clean water spring fed tributaries having a good diversity of fish at various places. Fish diversity of Udhampur district is low in comparison to the 80 fish species enlisted by Dutta and Kour (2005) for eastwhile Kathua district and 103 fish species from Jammu district by Dutta and Kour ((2006). This may be attributed to the diversified habitats of lotic and lentic water bodies in Jammu and Kathua districts.

Discussions with fishermen and local inhabitants have revealed a rapid decline in fish diversity and density and is caused by:-

- i. Deforestation and increased soil erosion adding large quantities of suspended materials.
- ii. Fall in water level and reduced water flow in rivers and streams caused by irregular and scanty rains and decline in springs and spring water discharge.
- iii. Construction of reservoirs.
- iv. Illegal fishing viz. poisoning, electric shocking, dynamiting and grenading.
- v. Overexploitation as is evidenced by rise in number of fishermen and use of small mesh size nets.
- vi. Fishing during breeding season.
- vii. Developmental activities like construction of new roads and widening of existing roads and construction of tunnels etc. . In these developmental activities, there is no proper scientific dumping of muck and it flows into nullahs, streams and rivers. As its consequence, there is filling of pools and covering of stony bottom by soft sediments and is a big loss to the benthic fauna and fish breeding grounds.
- viii. Introduction of exotic fishes
- ix. Water pollution in certain areas of Udhampur district is rapidly increasing and is a threat to fish diversity. In sacred Devak stream, in Udhampur city, there was a good fish diversity a few decades ago. Due to discharge of untreated

sewage, the water is highly polluted and there is no fish in the stream.

Conservation measures require

1. Reforestation in watershed is immediately required to check soil erosion and revival of springs through development of spring sanctuaries.
2. During developmental activities, muck generated should be scientifically managed to prevent its flow into the water bodies. There should be regular monitoring by the concerned agencies in this regard.
3. There are a good number of ancient ponds in the area and were earlier source of drinking water. Unfortunately, these ponds are totally neglected and are filled and encroached. These ponds should be renovated and protected and used by state fishery department for fish culture. Under Central Govt. sponsored schemes there is a provision for construction of new ponds and benefits of such schemes should be provided to unemployed youth in the district. Such ponds can also play an important role in rainwater-harvesting and ground water recharging.
4. Awareness of fishermen about the ill effects of illegal fishing methods, fishing during breeding season, and fishing of small sized fishes may go a long way in reviving the fish resources of the area. Fishing during breeding season should be banned and strictly implemented.
5. Fishery department should start breeding and rearing of some native fish species in ponds or collect eggs and larvae from natural waters and rear them in ponds. Fishes after a particular size should be introduced in natural waters at some selected places. This will help in conservation and increasing fish diversity in the district.
6. During construction of reservoirs care should be taken to provide fish migratory channels near the outlets. Fishery department should develop hatcheries for local fishes to ensure proper protection to fish in the lotic waters. In all such projects there is a separate allocation of funds for development of hatcheries in the reservoirs.
7. Before stocking any water body with exotic fishes, proper analysis of their impact should be clear. Lake Mansar, after mass mortality of local fish in February, 1997, was stocked with *Cyprinus carpio*. As a consequence of this, local



fish species, thriving earlier, have become almost extinct in the lake. Due to religious restriction, there is no fishing. Population of these exotic carps has crossed the carrying capacity of the lake. In absence of optimum food in the lake, there is a competition for food and space. Many fishes are badly injured. Lake Mansar was a wintering ground for migratory birds. Due to absence of trash fish and presence of large sized carps birds avoid visiting this lake during winter migration.

8. Development of fish sanctuaries. In Udhampur district, Behar Devta along river Tawi is a fish sanctuary for *Tor* and *Labeo* species. There is a temple on right side at this place and fishing is not permitted. A good number of fishes feed and breed in the area. Jib thaty is another fish sanctuary in the area. There is a Shiva temple and fishing is not permitted. A good number of fish species like *Tor*, *Labeo Garra* etc. breed in the area and are well protected. Some areas of lotic water bodies should be declared as fish protected areas and fishing should not be permitted.
9. In Udhampur district, along the river Tawi and its tributaries, are present a good number of paddy fields. In such paddy fields paddy cum fish culture can be initiated. State Fishery Department can undertake some experimental work by selecting some carps, including *Schizothorax richardsonii*, culture. It may be mentioned here that during the irrigation of paddy fields by natural water of streams, a large number of eggs, larvae and adult fishes belonging to various species enter these paddy fields and should be protected to initiate paddy-cum fish culture.

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