



Fish and Fish Fauna in Narayani River – A Pictorial Survey

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Abstract

The Narayani is the most important typical tropical river of Nepal. It has seven tributaries called the Saptagandaki and drains central Nepal between Langtang and Dhaulagiri himal. The Narayani river drains the edge of Chitwan National Park for down the Trivenighat section of narayani. The temperature of water at river was found ranging between 10.3-27.5°C. The maximum temperature was recorded at station Golaghat, the junction of Narayani and Rapti river in summer and lowest temperature of station was at Benighat, the junction between Trisuli and Budigandaki in winter season. Gandaki river system was found to be the best habitat for fresh water fishes due to its diverse habitat and ecotype.

*A total of 86 species were recorded from Narayani and Rapti river which belong to 18 family and 46 genera. Economically important fishes found are *Tor tor*, *Tor putitora*, *Labeo agra*, *Labeo dero*, *Wallago attu*, *Bagarius bagarius*, *Anguilla bengalensis* etc. During the study *Tor tor*, endangered species and some other nationally threatened species were also recorded from Gandaki river system.*

Key words: *Tor tor*, Narayani River, Nationally Threatened, Tributaries, Ecological Degradation

1. Introduction

Nepal has more than 6000 rivers. 1000 of which are more than 11 km long and about 100 of them are longer than 160 km (Sharma 1997, Gubhaju 2011). The total length of all streams and rivulets exceeds 45000 km. Annual mean flow is estimated to be 4930 m³/sec. This amounts to 70% of total surface runoff. Lakes, ponds and reservoirs amounts to 30% of the total surface runoff. Total available surface water potential is estimated to be 224 billion m³. Estimated ground water potential is 12 billion m³ (Sharma1997).

There have been numerous study of fishes conducted in the Indian sub-continent. However, there are very few studies conducted in Narayani and Rapti rivers and their tributaries that deal with defining the conservation priority areas and the role of fish conservation. The phase starts with Swar (1980) presenting the status of limnological studies and research in Nepal at the conference in Kyoto. It is followed by some monumental works on fisheries. Shrestha(1981) published Fishes of Nepal, a landmark book on fish fauna of Nepal.

There was an ecological survey of the Narayani River within the Royal Chitwan National Park by Edinburgh University Expedition to Nepal during 1984-1985 and the report was submitted to the King Mahendra Trust for Nature Conservation. The new records of fishes in Nepal continued with Edds(1985) and he also had the list of “The Fishes of Royal Chitwan National Park (1986)”.

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The same year he also had Fisheries of Kali Gandaki/Narayani Rivers published. Shrestha (1988) worked on the important game fish of Nepal, *Tor* sps. (Mahaseer) and published.

Study of Fish Fauna

It is evident from the previous heading that fairly a good number of studies and research have been carried out in the area of fish and fisheries in Nepal compare to the other fields of hydrology and aquatic ecosystem. The fishes of Nepal have been recorded as early as in 1822 by Hamilton and have been included in the work of many scientists such as Gunther (1861), Day (1889), Regan (1907), Menon (1949,1987), Hora (1952), Jayaram (1981,1999), Shrestha (1981, 1994, 1995, 1998, 2001), Shrestha (1994), Subba (1995), Talwar and Jhingran (1991) and Rajbanshi (1982, 2001). However, the total number of fish reported from Nepal varies in their works. Even the most reliable site on the internet (www.fishbase.org) counts it to be 155 species, which is different from many authors. In addition, there are some confusion also in the systematic position of some species, like the orders, families and genera.

This situation has been improved mainly by the effort of Shrestha (2001) who did a thorough taxonomic revision of her own earlier work (1995) where she had reported 185 species from Nepal. She has based her classification after the latest work of Jayaram (1999) and came up with a total of 182 species belonging to 93 genera under 31 families and 11 orders.

A total of 129 endemic species of fishes (including 27 families, 66 genera and 129 species) had been recorded in Nepal (Shrestha 1994). But the checklist of 179 indigenous fish species had been compiled from Nepal and included in her Book entitled Fishes, Fishing Implements and Methods of Nepal. Shrestha (2008) included 232 species of fishes found in Nepal in his book Ichthyology of Nepal. The book has described systematic account and description of fishes, fish environment, fishing in Nepal and taxonomy.

Jha and Bhujel (2014) reported that a total of 108 fish species from different sampling points of the Narayani River system in Chitwan and Nawalparasi district. These species were classified into 9 orders, 27 families and 70 genera. Among the orders, Cypriniformes had the highest number of species (49%) followed by Siluriformes (29%), Perciformes (12%), Synbranchiformes (4%), Osteoglossiformes (2%) while Anguiliformes, Beloniformes, Clupeiformes and Tetraodontiformes represented each by about 1%. Cyprinidae has the highest number of species (40.7%) among the families followed by Sisoridae(10.1%), Bagridae(7.4%), Cobitidae (4.6%), Schilbeidae (4.6%), Channidae(3.7%), Balitoridae(2.7%), Mastacembelidae (2.7%), Siluridae (2.7%), Notopteridae (1.8%), Ambassidae (1.8%), Nandidae (1.8%) and Mugilidae (1.8%). Other families accounted for about 1% were Anguillidae, Belonidae, Clupeidae, Psilorhynchidae, Anabantidae, Gobiidae, Belontidae, Synbranchidae, Amblycipitidae, Pangasidae, Clariidae, Heteropneustidae, Chacidaeand Tetraodontidae. Various stocks of carps, catfishes, gars, gobies, snakeheads, feather-backs, perch, loaches, eels and puffers were maintained and support livelihoods of people.

It has been reported that the size of the riverine fishes varies from 280 kg measuring 225cm Gouch or Thend (Sisorid catfish, *Bagarius yarrelli*) to the smallest (2.5 cm) yellowish-brown fish, Koshi Hara or Datkitari, Hara hara (Shrestha 2008). Other smallest fishes are *Pseudambassis lata* (3cm), *Physoschistura elongate* (3.3cm), *Brachydanio rerio* (4cm) etc.

2. Materials and methods

2.1 Study area

This study was confined from Malekhu to Triveni within the range of about 181.71 Km distance starting from Malekhu to Trivenighat. This study area covers the different altitudes and habitats. The Narayani or seven Gandak river system is one of the typical and tropical river of Nepal which is much changed due to human influences. The total length of the Narayani is about 332 km and discharge 52,930 cusecs (Shrestha, 2001).

The Narayani is the final collector of seven extremely complex drainage system of trans-Himalaya composed of countless creeks, hill streams, rivers, swamps, bogs and flood plain, jungle, lake and ox-bows. The different sections are of several distinct types varying in morphology of their beds as well as physics and chemistry of the waters, all these qualities being determined by the geological history of the area.

The main channels of the Gandaki river system existed even before the rise of the Himalayas and they have cut deep and vertical gorges, whose origins may be traced to Oligocene. Many antecedent rivers such as Kaligandaki, Trisuli and Budigandaki might have been formed then. In these rivers some traces of Tethys sediments are seen, this is revealed by Ammonites of Muktinath have come to be deposited Reu valley without break and disintegration. In all Gandaki watersheds conglomerate horizons are commonly deposited.

The River Narayani system plays a vital role in development of fisheries in Nepal. It constitutes one of the main natural resources if fish seed (spawn) much needed throughout the country for the fast growing fishes. The climate of Narayani watershed is subtropical and tropical. Rapti river is originated from Churia hill. The flow of the water is maximum during rainy season and very low in winter and summer seasons. This river is regarded as hot water river, so varieties of fish fauna which can survive in hot water can live and breed there. Most of the part of this river is located inside the Chitwan National Park, the oldest national park of Nepal.

3. Materials

a) Measuring tape, scale b) White paper c) 10% formaldehyde d) pH meter
e) Thermometer f) Camera g) Fishing equipments

3.1 Methods

3.1.1 Sources of data collection

Both Primary and secondary data were collected from different study sites during this study. Primary data were collected directly from the field visit, fisherman and interview. The secondary data were collected from different published and unpublished literature.

3.1.2 Fish collection and identification

The fishes were collected seasonally from January to May 2017 from each sampling sites. The fishes were collected from the fisher man from each sampling sites. The large fish were measured and recorded their fin formula and all other information and then photographed.

3.1.3 Measurements of fish for fish identification

- 1) Fin rays: fin rays of each fins (Dorsal, Pelvic, Ventral, Anal and caudal) were counted by the help of forceps for the identification.
 - a. Hard rays (written in roman number as bold)
 - b. Soft rays (written as Arabic number)
- 2) Number of scales:
 - a. Along the lateral line
 - b. From the base of the dorsal fin to downwards anteriorly in the same oblique line up to ventral surface.
- 3) Number of barbels: These were counted with the forceps with pointed tip.

3.1.4 Fish identification

All the collected fishes were preserved at 10% formaldehyde. At first collected fishes were sorted according to their similarities and dissimilarities, First segregation was made by the presence or absence of scales on the body. In the case of those with scales, fishes were separated into different lots according to their body shape, number and length of fins. Likewise, in case of scale less fishes (i.e. catfishes), these were separated according to the total number of barbells in them (like one, two or four pairs). The fish were identified by using standard literature after Shrestha (2001, 2008) and Jayaram (1999).

3.2. Data analysis

Field data are analyzed by using charts, tables and other tests by using standard statistical software.

3.3 Findings

Following fishes were collected which are depicted in photographs.

Some fish fauna recorded from Gandaki river system, Nepal.



Figure 1. *Acanthobotis botia*



Figure 2. *Aorichthys aor*



Figure 3. *Aorichthys seenghala*



Figure 4. *Barilius barna*



Figure 5. *Barilius bendelisis*



Figure 6. *Botia almorhae*



Figure 7. *Channa marulius*



Figure 8. *Monopteruss cuchia*



Figure 9. *Crossocheilus latius*



Figure 10. *Eutropiichthys vacha*



Figure 11. *Glyptothorax kashmiren*



Figure 12. *Glyptothorax trilineatus*



Figure 13. *Glyptothorax alaknandi*



Figure 14. *Glyptothorax telchitta*



Figure 15. *Labeo caeruleus*



Figure 16. *Labeo calbasu*



17. *Labeo dyocheilus*



Figure 18. *Labeo fimbriatus*



Figure 19. *Macrognathus pancalus*



Figure 20. *Myersglanis blythi*



Figure 21. *Mystus guilo*



Figure 22. *Nandus nandus*



Figure 23. *Nangra viridescens*



Figure 24. *Neolissochilus hexagonolepas*



Figure 25. *Notopterus notopterus*



Figure 26. *Ompok bimaculatus*



Figure 27. *Pseudecheneis eddsi*



Figure 28. *Puntius sophore*



Figure 29. *Pseudecheneis seracula*



Figure 30. *Anguilla bengalensis*



Figure 31. *Cirrhinus mrigala*



Figure 32. *Schizothorax richardsonii*



Figure 33. *Sisor rheophilus*



Figure 34. *Tor putitora*



Figure 35. *Tor tor*

Recommendations

Improvement of fisheries in natural river offers a great opportunity for self employment and income generation. For the successful conservation and management of fish species in Narayani river all illegal fish killing and the disposal of wastes without treatment should be banned.

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