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Fish diversity and some nets in Baur reservoir of Gularbhoj U.S. Nagar Uttarakhand, India

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Abstract
The purpose of the current study was to investigate the fish fauna's variety and nets in the Baur Reservoir located in Gularbhoj, U.S. Nagar, Uttarakhand, India. The two main uses of reservoir water are fish culture and irrigation. Baur Reservoir is home to an enormous diversity of aquatic life. The current study was carried out from January 2022 to December 2022 throughout a one-year timeframe. Eight families and eighteen species are found to be part of the Cyprinidae, Ophiocephalidae, Centropomidae, Bagridae, Belonidae, Osphronemidae, Notopteridae and Siluridae families and various type of nets like (Cast net, Fixed gillnet, Hand net etc) found during the course of the study. This study report provides a full taxonomic explanation of these fish species.

Keywords: Ichthyofauna, net, baur reservoir, Gularbhoj, resources, Uttarakhand

Introduction

Rivers, regarded as the lifeblood of every area, are priceless natural resources that have long provided ecological and commercial benefits to humans the start of human civilization. Dams modify the natural river flow patterns and interfere with the required resource redistribution (Poff *et al*., 1997; Tockner *et al*., 2000) [20, 28]. Additionally, the extent of influence on aquatic ecosystems varies depending on the operation of the dam in addition to the unique features of the impacted watershed (Hart *et al*; 2002) [6]. Fish species diversity is connected with depth flow, substrate types, and habitat complexity (Gorman and Karr, 1978 [3]; Schlosser, 1982) [26]. Many latitudes have seen in-depth research on the effects of these habitat characteristics on the composition and behavior of fish assemblages in streams (Mathew and Hill, 1980; Leveque, 1997) [14, 15].

Studying the impact of scale on the relative significance of the variables determining variety is made possible by reservoirs. In general, reservoirs are very new, and the species found in their populations are a mix of both introduced and historical riverine fish species (Fernando & Holcík 1991; Oliveira & Goulart 2000; Oliveira *et al*. 2004) [4, 16, 17]. A combination of species from the ancient riverine fish fauna and introduced species make up the populations of these relatively new reservoirs on a broad scale (Fernando and Holcik, 1991; Oliveira and Goulart, 2000; Parashuram *et al*., 2007) [4, 17, 19]. They are crucial to the geochemical cycling of elements and have an impact on the chemical composition and material transfer of the river system, according to Abhay *et al*. 2005 [1].

Fish inhabit nearly every type of aquatic habitat there is when it comes to habitat variety. There are very few bodies of water without fish. Fish can exist in a wide variety of aquatic settings with varying water quality, which contributes to their great diversity. Fishing net is a net used for fishing. Fishing nets are usually meshes formed by knotting a relatively thin thread. Early nets were woven from grasses, flaxes and other fibrous plant material. Later cotton was used. Modern nets are usually made of artificial polyamides like nylon, although nets of organic polyamides such as wool or silk thread were common until recently and are still used. In present study an attempt has been made to study the ichthyodiversity and various types of nets from January 2022 to December 2022 in Baur reservoir at Gularbhoj in U.S. Nagar, U.K, India. Baur reservoir situated in Gularbhoj village in the Gadarpur Block of Udham Singh Nagar district and is fed by Baur and Kakarata rivers. The total catchment of the reservoirs is 605 square kilometers. Water holding capacity of these reservoirs is 3650 million cubic feet. Total volume content of dam (TCM) is 8252.Work on this reservoir began in year 1966-67. Its catchment area mainly comprises of Tarai and Bhaber, which is spread over an area of 307.2km^2.

Material and Method

Fish specimens that were taken from the Baur reservoir were transported to the lab right away and preserved in formalin solution in glass jars. Recognition and fish taxonomy studies were conducted in R.H.G.P.G. College lab using reference materials literary Day F. (1878) [2], Khanna, and Hamilton (1822) [5] Khanna and Bhutiani (2008) [13], Khanna and Bhutiani (2007) [12], Talwar and Jhingran (1998), Jayaram (2011) [8]. The data were collected by questioner interview with fishermen about different fishing nets operate in reservoir (Azam et.al.2014). Data were not only noted by questioner interview, but also by proper investigation at gear selling market area.

Result and Discussion

930 of the 2,500 freshwater fish species that have been identified as existing in the Indian subcontinent are considered to be freshwater species. 1570 of them are maritime (Kar, 2003 [11]; Gayaram, 1999). At Tumaria Reservoir, a wide diversity of fish was according to (Rawat 1991 and Pramod 2019) [25]. Joshi 2006, Raveendar 2018 [24] and Rajesh 2021 [23], also found large variety of fishes in Nanak Sagar dam. Pathani and Joshi defind Ichthyo-fauna and fishery in Nanaksagar reservoir of Uttarakhand State, in 2007.

During the study period total 16 species were identified from 5 order, 8 families from reservoir (Table 1), and three

main type of nets are identify during study period (Fig 3). During the study period commonly used cast net, gill net and hand net. Similar study was done by Promod joshi 2011 [9, 21] in Nanak sagar reservoir. Cast net is also known as throw net, it is often target small schooling species of fish and shrimp near the surface (Chopin et.al 2021). Fishing gears is common use in reservoir are gillnets. Gillnets are usually operated in the night, setting usually done before sunset and hauling by morning. All kind og fishes and prawns are caught in theses net in baur reservoir mainly *Catla catla*, *Labeo rohita*, *Cirrhinus mrigala* are mainly caught during study period. Another one net is hand net, also called scoop or dip net mainly uses in baur reservoir, generally small fishes are caught by this net.

Table 1: Fish diversity in Baur Reservoir from January 2022-December 2022.

Order	Family	Scientific Name	Fin Formula	Local Name
Clupeiformes	Notopteridae	Notopterus notopterus	D.8(1/7);P.17;V.6;A.100;C.19;L.I.200;L.rt.25/50	Patra
Cypriniformes	Cyprinidae	Chagunius chagunio	D.11(3/8);P.15;V8;A 8(3/5)	Puthia
		Puntius sarana	D.11(3/8);P.15;V.9;A.8(3/5);C.19;L.I.32; L.tr.61/6/5	Puthia
		Puntius sophore	D.11(3/8);P.15;V.9;A.8(2/6);C.19;L.I.23; L.tr.41/2/4/1/2	Puthia
		Catla catla	D.18(3/15);P.19;V.9;A.8(3/5);C.19;L.I.38; L.tr.71/2/6	Katla
		Cirrhinus mrigala	D.15(3/12);P.18;V.9;A.8(2/6);C.19;L.I.42; L.tr.7	Nain
		Labeo rohita	D.16(3/13);P.17;V.9;A.7(2/5);C.19;L.I.42; L.tr.7	Rohu
		Labeo bata	D4/9-10,$P_1$1/15-17,P_2.1/8.A.2-3	Rohu
		Channa micropltes	D.45-55;A 28-36;P 16-18;V6	Channa fish
		Tor putitora	D.8;A.5;P.16-17;V.8	Mahseer
	Dorosomatida	Tenuolosa ilisha	D.4;P14;V.14-16;A.2(16-20);P14;V.7	Pala fish
	Siluridae	Ompok pabola	D.5; P.1/14; V.9-10; A.3/66-71; Barbles two pairs	Laachi
	Bagridae	Sperata aor	D.8(1/7);P.10(1/9);V.6;A.11(3/8);C.17; Barbles four pairs	Tengra
		Sperata seenghala	D.1/7;P_1.1/9;P_2.1/5;A.11-12	Seenghala
		Mystus tengara	D.7;A.9-10;P.8;V.5	Tengra
Beloniformes	Belonidae	Xenetodon cancila	D.16;P.11;V.6;A.17;C.15	Nunwa
	Exocoetidae	Parexoetidae branchypterus	D.12-14;A.12-14;Pevic fin short.	Flying fish
Perciformes	Osphronemidae	Trichogaster fasciata	D.10-14;P.9-10.A15-17.C.18-20	Bhedal

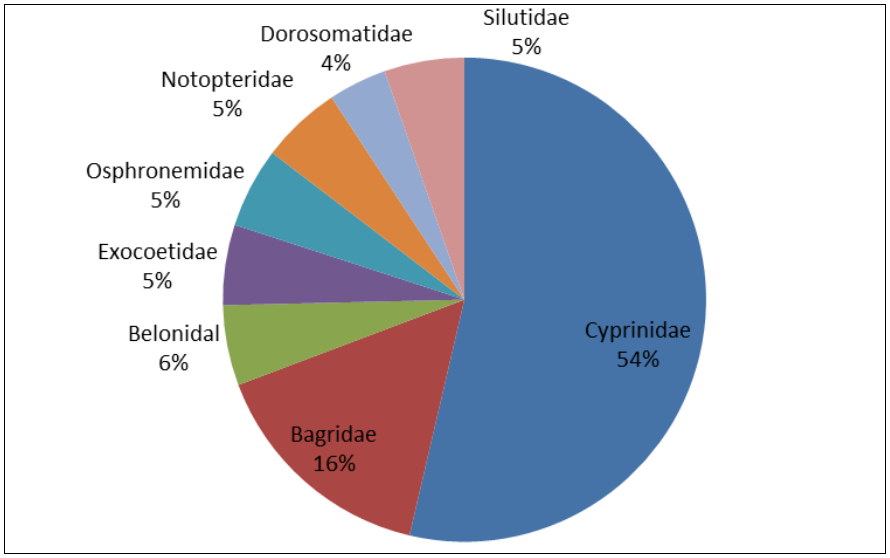


Fig 1: Percentage occurrence of Fish family in Baur Reservoir from January to December 2022.

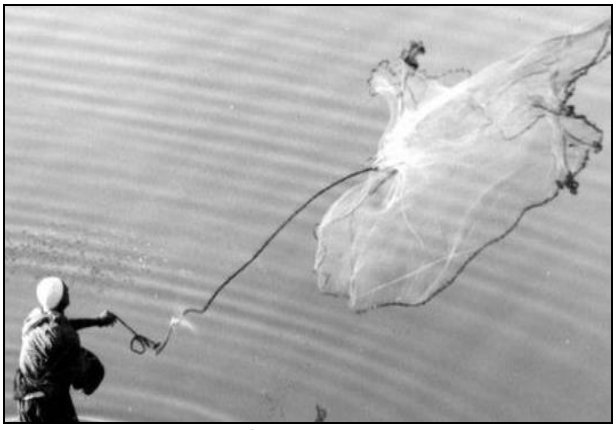
10 species of Cyprinidae, 1 species of Notopteridae, Dorosomatidae, Silutidae, Osphronemidae, 3 species of Bagridae, have been identified. Cyprinidae family is dominated and sub dominatedfamily is Bagridae. Family Cyprinidae, Bagridae, Belonidal, Osphronemidae, Notopteride, Dorosomatidae, Belonidal and Exocoetidae members name are shown in Table 1.

Catla catla (Katla) *Cirrhinus mrigala* (Nain)

Fig 2: Pictures of some fishes in Baur Reservoir

Fixed gillnet

Hand net



Cast net

Fig 3: Pictures showing some different type of Nets uses in Baur Reservoir in year 2022.

The present study shows there is a good deal of fish diversity and nets uses in the Baur reservoir, including some valuable species that are useful for commerce. Additionally Major Indian carps in the reservoir several substantial big fish of the categories: Sperata seenghala, S. catfishes. As for the Channa Marcus, punctatus a few additional little carps Labiobata bata, ect. Consequently, there is Diversity of Ichthyofaunal in Baur Reservoir. Development of the reservoir must be sustainable base. However, the urgent necessity is to increase fish yield and conservation of fish diversity at the same time.

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