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Diversity and Composition of Fishes of Chaskaman Dam, Rajgurunagar, part of Northern Western Ghats, Pune, MS, India

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Abstract

The Western Ghats streams exhibit high variability in fish assembles. Chaskaman dam is one of the prime dams in Pune district (MS). Its storage capacity of water is 246 Million cubic meters. The depth of water at the wall of the dam is about 150 m. This area receives precipitation from southwest monsoon (June to September). It is one of the prime Dams of Pune district and unexplored.In the present study, an attempt has been made to collect various species, as this Dam has not been paid too much attention in biodiversity and resource assessment studies. As many as 30 species belonging to 4 Orders, 11 Families of 24 Genera were recorded. In the assemblage structure of Chaskaman dam is dominated by cyprinids 19 species, followed by 6 species of perches, 4 species of Siluriformes and 1 species of Synbranchiformes. Oreochromis mossambica (Peters) exotic species were recorded in Chaskaman Dam. Seven endemic species of Western Ghats were found occurring in this dam.

Key words: Fish diversity, composition, Chaskaman Dam, Bhima River, Western Ghats.

Introduction

Rajgurunagar is a town in Pune, Maharashtra. It is located at the end of northern block of the Pune district in Maharashtra state of India. Rajgurunagar is located on the bank of the Bhima River and 40 km away from Pune. Present study deals with a Chaskaman dam which is situated in Rajgurunagar in Pune district. Chaskaman dam was built on 1977 at Bibi village. It consists of built up of Bhima River which is Northern western India. Depth of water at the wall of the dam of about 150 m. Water stays in the dam whole year.

Considering the importance of fresh water resources in inland fishery, number of studies had been conducted, involving various aspects of dams and reservoir fisheries such as on Chilka Lake, Stanley Reservoir, Sardar Sagar and Kandhar Tank[1]. The Western Ghats streams exhibit high variability in fish assembles and the assemblage composition is determined by specific ecological conditions[2,3]. The Western Ghats, located along the southwest coastline of the Indian subcontinent, is a biodiversity 'Hotspot' and is extremely rich in fish diversity and endemic[4,5,6]. Most of the information on fish habitat structure an assemblages are available from temperate streams and very meager information is available in Indian streams[2].

Chaskaman dam situated at 18^0-15'-40" North and 73^o-47'-15" East; at an average altitude 1000 ml. Various forest types such as tropical evergreen, semi-evergreen, moist and dry deciduous and high altitude shoals mingle with natural and manmade grasslands, in addition to agriculture, plantation crops, stream valley projects mining areas and many other land uses. Species richness at local scale, however, are more dependent on biological factors like competition and predation as well as physical factors like habitat diversity; Water chemistry, flow regimes, temperature[7]. The biological study of water is helpful in problems like pollution control, the construction and renovation of dams and lakes, fish and aquatic life. For fish communities, substrate complexity, stream flow and water quality characteristics were found to be important in determining local richnes[7]. Species assort themselves along environmental gradients like pH, temperature etc. and their diversity increases in going from upstream to downstream.

Material and Methods

The fish sample was carried out in between August 2010 to August 2011. Fish sample were collected through experimental fishing using cast net, gill nets, drag nets and also used the local tires. Based on the fish catch, species richness and fish abundant data were generated for each site. Fishes have been preserved in 4% formalin.

For fish sampling four collection sites were selected according to the substrate type muddy, pebbles and gravels, sand and silt and Rocky. The sampling was made 100-150 m stretches of each site. At each site pH, temperature, percentage canopy cover measured. The Northern Western Ghats streams exhibit high variability in fish assemblages and the assemblage composition is determined by specific ecological conditions[2].

For identification of fishes have been identified using standard literatures[8,9,10] and also with help of Zoological Survey of India, Akurdi (Pune).

Results and Discussion

The present inventory study fishes comprising a total 30 species belonging to 4 orders, 11 families and 24 genera. In the assemblage structure, cyprinids constitute the dominant group.

Table-1
Composition of fish species in order of Chaskaman Dam, Rajgurunagar

Composition of fish species in order of Chaskaman Dam, Rajgurunagar (Pune)			
Cyprini-formes	Synbranchi formes	Perci-formes	Suluri-formes
19	1	6	4

The fishes found in the water body[11] belong to major carps, exotic carps, local variety and very limited variety of crabs. The pH of water bodies under investigation range in between 7.4-7.9 pH showed minor seasonal variations. It was recorded maximum during summer and is associated high photosynthetic activity in water. Present studies showed pH range favorable for aquatic life, irrigation and domestic use. The water temperature varied between ranges of 25^0 to 31^0C. It was found maximum at Rocky region.

The present icthyofaunal study of Chaskaman dam reveals 30 species under 4 orders, belonging to 11 families of 24 genera. The icthyofauna of Chaskaman dam is dominated by cyprinids 19 species (Order: Cypriniformes), 6 species of perches (Order: Perciformes), followed by 4 species of catfishes (Order: Siluriformes) and 1 species of other (Order: Synbranchiformes) showing above graph. In the order Cypriniformes, family Cyprinidae (Carps, barbs, minnows) contains larger number of species 14 and loaches, stone loaches (family : Balitoridae) represent 5 species.

Order Cypriniformes forms predominant group with followed by 63.34 %, Perciformes 20 %, Siluriformes 13.40 % and Synbranchiformes 3.34 % in the Chaskaman dam which is showing figure-2.

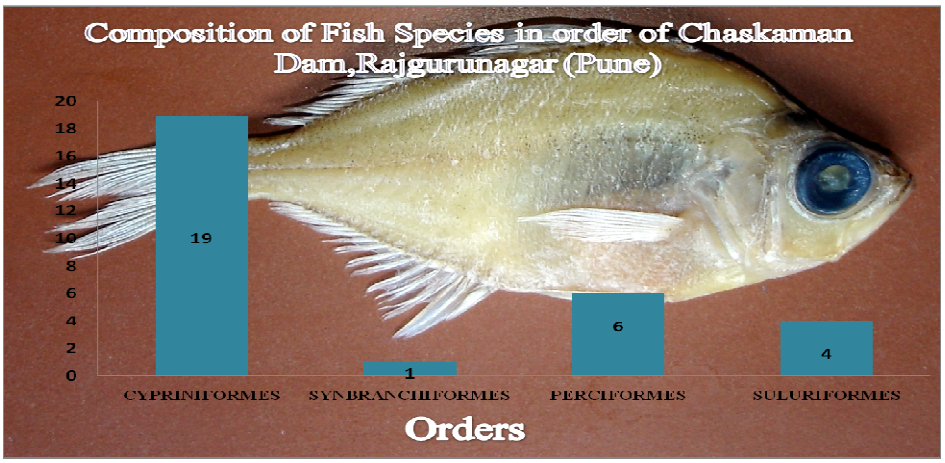

Figure-1
Graph showing order composition of fish species

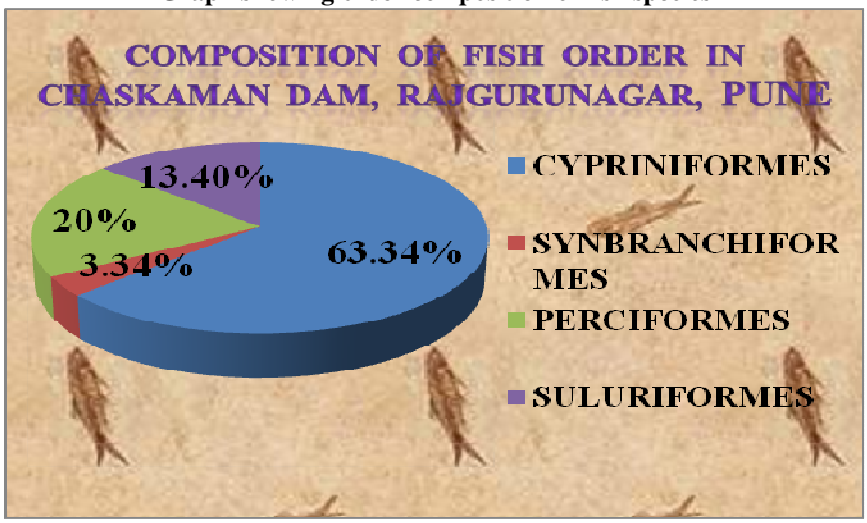

Figure-2
Pie chart is showing percentage composition of fish order in Chaskaman dam

During the present investigation, muddy substrate have maximum number 23 species, pebbles and gravels have 21 species, sand and silt with 17 species and rocky substratum has lower number of 12 species. One exotic species *Oreochromis mossambica* (Peters) were recorded. Seven endemic species of Western Ghats were found occurring in this dam. The percentage canopy cover is also observed to be an important parameter. Species like *Puntius ticto, Puntius sarana* were associated with maximal canopy cover whereas species like *Salmostoma boopis, Salmostoma bacaila, Glossogobius giuris* were occurred in low canopy cover.

Four species *Cirrhinus fulungee* (Sykes.), *Puntius sarana* (Ham-Buch.), *Salmostoma bacaila* and *Chanda nama* (Ham-Buch.) are threatened very rare. *Labeo boggut* (Sykes), *Channa punctatus* (Bloch.) and *Glossogobius giuris* are rare. *Garra mullya* (Sykes) and *Rasbora daniconius* (Ham-Buch) are very common.

Table-2
Threatened species list of sites in Chaskaman dam, Rajgurunagar

Distribution of Threatened status in Chaskaman Dam, Rajgurunagar (Pune)				
Very rare	Rare	Moderate	Common	Very common
13.33%	10.00%	23%	47%	6.67%

During the present sites of Chaskaman dam belonging to 30 species. Distribution of Threatened status in Chaskaman dam is followed by 13.33% Very rare, 10.00% Rare, 23.00% Moderate, 47.00% Common and 6.67% are Very common (figure-3).

Conclusion

The present research in which *Cirrhinus fulungee* (Sykes.) is an exotic species found in Chaskaman dam, Rajgurunagar, part of Northern Western Ghats, Pune. This investigated study was concluded that the exotic *Cirrhinus fulungee* (Sykes) species were immediate to save and conserve. This information provided with help in understand the threatened as well as diversity and conservation of fresh water fishes found in Chas Kaman Dam, Pune, India. It is an urgent need to conserve the dam and natural resources by applying conservative measures.

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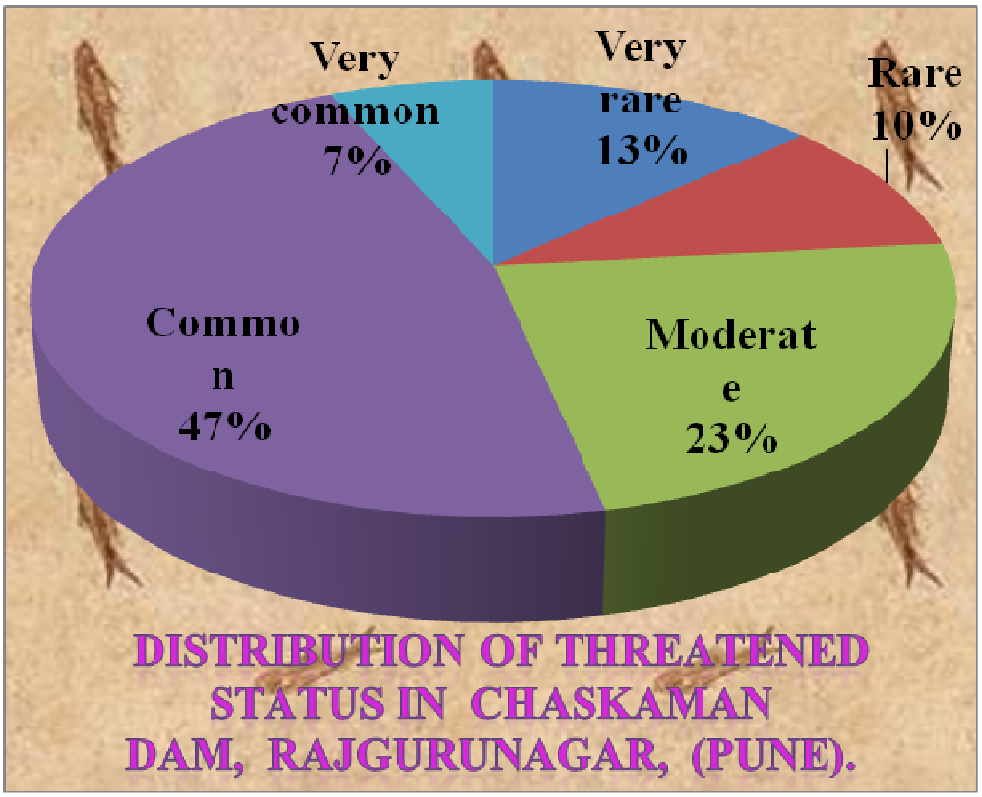

Figure-3
Pie chart is showing Distribution percentage of Threatened status in Chaskaman Dam, Rajgurunagar (Pune)

Table-3
Threatened species list of sites in Chaskaman dam, Rajgurunagar

Fish Species	Threatened Status	Station (Muddy)	Station (Pebbles and Gravels)	Station (Sand and Silt)	Station (Rocky)
Puntius ticto (Ham-Buch.)	Common	12	07	11	06
Gronoproktopterus kolus (Sykes.)	Common	09	04	08	--
Labeo boggut (Sykes.)	Rare	07	--	02	--
Cirrhinus fulungee (Sykes.)	Very rare	--	02	--	--
Catla catla (Ham-Buch.)	Common	14	08	11	--
Labeo rohita (Ham-Buch.)	Common	15	06	07	--
Puntius sophore (Ham-Buch.)	Moderate	13	04	01	--
Puntius sarana (Ham-Buch.)	Very rare	05	--	--	--
Salmostoma bacaila (Ham-Buch.)	Very rare	--	01	--	--
Garra mullya (Sykes.)	Very Common	12	09	16	15
Salmophasia phulo phulo (Ham-Buch.)	Moderate	10	06	03	--
Salmophasia boopis (Day.)	Moderate	--	03	--	15
Danio aequipinnatus (McClelland.)	Moderate	07	05	--	--
Rasbora daniconius (Ham-Buch.)	Very Common	18	07	12	25
Lepidocephalus guntea (Ham-Buch.)	Moderate	18	--	--	--
Noemacheilus d. denisoni (Day)	Common	03	11	--	13
Acanthocobitis botia (Ham-Buch.)	Common	--	09	06	15
Noemachilichthys ruppelli (Sykes.)	Moderate	--	04	01	11
Oreonectes evezardi (Day.)	Common	02	08	--	17
Mastacembelus armatus (Lacepede.)	Common	15	13	05	--
Oreochromis mossambica (Peters.)	Common	12	14	03	--
Channa punctatus (Bloch.)	Rare	08	--	--	--
Channa orientalis (Bloch & Schneider.)	Common	16	--	12	--
Glossogobius giuris giuris (Ham-Buch.)	Rare	07	03	--	--
Chanda nama (Ham-Buch.)	Very rare	--	--	--	01
Parambassis ranga (Ham-Buch.)	Moderate	--	04	08	--
Mystus bleekeri (Day.)	Common	05	07	12	05
Mystus malabaricus (Jerdon.)	Common	13	08	--	17
Ompok bimaculatus (Bloch.)	Common	14	05	07	10
Clarias batrachus (Linn.)	Common	12	08	03	--

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