

Ichthyofauna of Dharmapuri Forest Division, Tamil Nadu: Status, threats and management

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Abstract

A survey of fishes was conducted along the streams and tributaries of Cauvery river in the Dharmapuri forest division, Tamil Nadu. Thirty three species representing 6 orders, 14 families and 26 genera were recorded during the study. Cyprinids formed the dominant group among the fishes. Introduced species and predatory fishes were more abundant than native fishes. Tourism induced habitat modifications and pollution are major threats to fish diversity. Fish species and the impacts of anthropogenic activities are discussed to improve the monitoring programmes and conservation measures.

Keywords: Cauvery river, introduced species, predatory fishes, pollution

INTRODUCTION

The fish diversity of a nation depends on the geographical position, varied ecological conditions, status of the aquatic systems and optimum exploitation of the economically important fishes (Johal, 2005). Indian subcontinent has a unique fish fauna, especially in the southern peninsula, which collided with the northern portion of the country to bring with it a separate, more ancient fauna. The combination of different origins and a wide variety of habitats have led to create a highly diverse fish fauna. Cauvery river is known for its very diverse array of fish species which make up extremely interesting and complex communities (Muralidharan *et al.*, 2011). Cauvery river, one of the perennial rivers of Tamil Nadu, rising from Talacauvery on Brahmagiri Hill in the Western Ghats in Karnataka state, flows south-easterly through Karnataka and Tamil Nadu states before emptying into the Bay of Bengal. Upon entering Tamil Nadu, the Cauvery continues through a series of twisted wild gorges until it reaches Hogenakal falls above Stanley Reservoir in Mettur. Dharmapuri forest division, which comprises the southern part of Eastern Ghats, is composed of rugged terrain with scarcely wooded hilly ranges. This region is drained mainly

by Cauvery and Chinnar rivers and numerous other seasonal streams. The Chinnar river confluences with Cauvery river at Hogenakkal. Most streams/rivers in this region are seasonal and hence ephemeral except Cauvery and Chinnar rivers. Surveys had been undertaken earlier on the Ichthyofaunal aspects in the region and adjacent lotic systems by Jayaram *et al.* (1982) who reported on the fishes of entire Cauvery river, including the fish fauna occurring in Hogenakkal; Remadevi and Raghunathan (1999) recorded the fishes from Dharmapuri District. However the documentation of ichthyofauna elements inhabiting the rivers of Eastern Ghats is not complete. It has been reported that the water bodies in Dharmapuri district showed the presence of only 30 species. Recent studies on the fish community composition provide annotated list of fishes from river systems and reservoirs in Dharmapuri and Krishnagiri Districts (Raja *et al.*, 2014 a,b) The present study reports the fish diversity of river systems in Dharmapuri forest division and discussing the status, threats for conservation priorities and management options.

MATERIALS AND METHODS

Fish species inhabiting streams/rivers of Cauveri, Chinnar and Othupallam stream under Dharmapuri and Hogenakkal ranges were collected during the survey. Fishes were collected using monofilamentous gill nets, cast nets and drag nets wherever applicable. Fish species reaching the market from fish catches of local fisher folks were also included in the list. Fishes

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caught were released after identification and few samples are being kept preserved as voucher specimens in the Sri Paramakalyni Centre for Environmental Sciences, Manonmaniam Sundaranar University, Alwarkurichi. Fish identification was based on Talwar and Jhingran (1991) and Jayaram (2013).

RESULTS

During this fish survey 33 species representing 6 orders, 14 families and 29 genera were recorded (Table 1). The family Cyprinidae dominated the list with 16 species represented from 14 genera followed by Bagridae with 3 species from two genera. The *Puntius* complex, taxonomically enigmatic group of fishes represented by 5 species was also rich in terms of abundance, with about 21% of the total fishes sampled. Fishes of the bagrid catfish genera *Sperata* and *Mystus* contributed 5% each to the total samples collected. The exotic genus *Oreochromis* and the economically important genera *Ompak* and *Pangasius* represented about 4% each, when all the other genera put together amounted to 39% of the fish abundance.

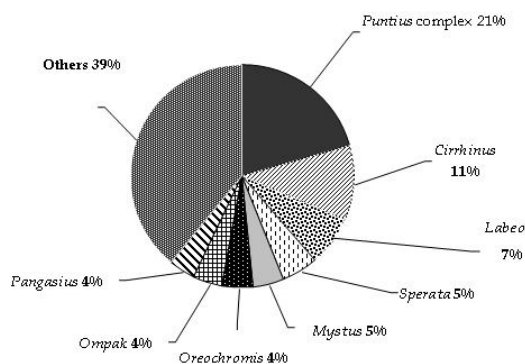


Fig. 1. Generic richness based on abundance observed during the survey

DISCUSSION

Unlike the river stretches of Western Ghats, the documentation of ichthyofaunal elements inhabiting the rivers of Eastern Ghats has been incomplete (Raja *et al.*, 2014a). The only available report on fishes of entire Eastern Ghats was made by Rema Devi and Indra (2003) who listed 127 fish species based on their collections and the patchy reports made in the past. It has been reported that the water bodies in Dharmapuri forest division showed the presence of approximately 30 species (Jayaram *et al.*, 1982; Remadevi and Raghunathan, 1999). Recent survey on fish composition in Chinnar river including the Chinnar reservoir yielded 32 species (Raja *et al.*, 2014). Few species that were recorded during one or the other above mentioned surveys and those that were not reported during this survey are *Hypselobarbus dubius* (Day) *Salmophasia* (*Salmostoma*) *untrachi* (Day), *Esosmus thermoicus* (Val.), *Labeo boggut* (Sykes), *Labeo dero* (Ham.), *Osteobrama cotio cotio* (Ham.), *Wallago attu* (Schneider)

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and *Silonia childreni* Sykes. *Mystus punctatus* and *Xenentodon cancila*, and hence they become new reports. Introduced fish species such as *Catla catla*, *Cirrhinus mrigala*, *Labeo rohita*, *Labeo calbasu* and *Cirrhinus reba* are available in abundance. *Sperata aor*, *Mystus cavasius*, *Pangasius pangasius* and *Ompok bimaculatus* are found as dense populations. *Oreochromis mossambica* has established well, owing to its tolerant nature and high reproductive potentiality, and at the same time they pose a threat to the native fish diversity.

Status of fishes and habitats

Fish is ecologically important for the role it plays in aquatic system, apart from that it is considered as cheapest source of healthy protein. Fishery sector provides enormous opportunities including employment, contributes to livelihood for rural and economically under privileged sections of the country. However increasing dependence on limited resources has led to serious problems. Many of the native communities have shown decline in population due to pollution and habitat destruction and further by the competition from exotic and introduced forms. Of the 31 species recorded from Cauvery of Hogenekal, none is endemic and about 4 are introduced by the fisheries. Percentage contribution of cultivable species in the fish landing centers clearly showed their dominance over native fishes. Nevertheless, there are still many interesting native communities left, reflecting pristineness, diversity and self-sustaining populations in isolated river segments.

The main human pressures on native fish stocks in this region are over exploitation, pollution from tourism, loss of habitat and alterations in land use. Threats as evident in study reaches were over fishing, destruction and modification of habitats, poor water quality and competition from exotic/introduced species. Probably the single greatest threat to indigenous species is habitat degradation. Interestingly, the local fisher folks are aware of the habitat modifications and the gradual changes in species distribution and report that the reduction in fish catch is due to pressure from anthropogenic disturbances. According to them, the species that have declined much in population are *Ompak bimaculatus*, *Sperata aor*, *Mystus cavasius*, *Pangasius pangasius* and *Silonia childreni*. *Wallago attu*, once known to be abundant in particular stretches of Cauvery has become rare.

Apart from Coracle rowing for tourists most of the people here depend on fishery for their livelihood. It is notable that the fishery resources alone help sustain their living with no additional source of income. Irrespective of age every member of the family is involved in fishing activities. Checkdam at Oothupallam is exploited for tank fishery; a self help group in this region utilizes this tank effectively for aquaculture.

Table 1. List of fishes collected from river Cauvery and tributaries in Dharmapuri Forest Division

S. No.	Name of the fish	Cauveri Hognekal	Chinnar	Othupallam
1	Order: Osteoglossiformes			
	Family: Notopteridae			
	<i>Notopterus notopterus</i> (Pallas)	*	-	-
	Order: Cypriniformes			
	Family: Cyprinidae			
	Subfamily: Cultrinae			
2	<i>Salmophasia (Salmostoma) clupeoides</i> (Bloch)	*	-	-
	Sub family: Rasborinae			
3	<i>Devario aequipinnatus</i> (McClelland)	*	*	-
4	<i>Rasbora daniconius</i> (Hamilton)	*	*	*
5	<i>Barilius bendelisis</i> (Hamilton)	*	-	-
6	<i>Gibelion catla</i> (Hamilton)	*	-	-
7	<i>Cirrhinus mrigala</i> (Hamilton)	*	-	-
8	<i>Cirrhinus reba</i> (Hamilton)	*	-	-
9	<i>Labeo calbasu</i> (Hamilton)	*	-	-
10	<i>Labeo rohita</i> (Hamilton)	*	-	-
11	<i>Kantaka (Osteochilus) brevidorsalis</i> (Day)	*	-	-
12	<i>Puntius bimaculatus</i> (Bleeker)	*	*	*
13	<i>Pethia conchonius</i> (Hamilton)	*	*	*
14	<i>Dawkinsia filamentosus</i> (Valenciennes)	*	*	-
15	<i>Barbodes carnaticus</i> (Jerdon)	*	-	-
16	<i>Systemus sarana</i> (Valenciennes)	*	-	-
17	<i>Tor khudree</i> (Sykes)	*	-	-
	Subfamily: Garrinae			
18	<i>Garra mullya</i> (Sykes)	*	-	-
	Family: Cobitidae			
19	<i>Lepidocephalichthys thermalis</i> (Valenciennes)	*	*	*
	Order: Siluriformes			
	Family: Bagridae			

S. No.	Name of the fish	Cauveri Hognekal	Chinnar	Othupallam
20	<i>Mystus cavasius</i> (Hamilton)	*	-	-
21	<i>Mystus punctatus</i> (Jerdon)	*	-	
22	<i>Sperata aor</i> (Hamilton)	*	-	-
	Family: Siluridae			
23	<i>Ompak bimaculatus</i> (Bloch)	*	-	-
	Family: Pangasidae			
24	<i>Pangasius pangasius</i> (Hamilton)	*	-	-
	Family: Poecilidae			
25	<i>Gambusia affinis</i> (Baird and Girard)	*	*	*
	Order: Perciformes			
	Family: Chandidae			
26	<i>Parambassis ranga</i> (Hamilton)	*	-	-
	Family: Cichlidae.			
27	<i>Etilopterus maculatus</i> (Bloch)	*	*	-
28	<i>Oreochromis mossambica</i> (Peters)	*	*	*
	Family: Gobidae			
29	<i>Glossogobius giuris</i> (Hamilton)	*	*	-
	Family: Channidae			
30	<i>Channa orientalis</i> Bloch and Schnieder	*	*	-
	Order: Cyprinodontiformes			
	Family: Aplocheilidae			
31	<i>Aplocheilus lineatus</i> (Valenciennes)	*	*	*
	Family: Belonidae			
32	<i>Xenentoden cancila</i> (Hamilton)	*	-	-
	Order: Mastacembeliformes			
	Family: Mastacembelidae			
33	<i>Mastacembelus armatus</i> (Lacepede)	*	-	-

Threats

Over exploitation and improper fishing methods

Exploitation of fish resources beyond sustainable limits could lead to extinction of species. Target specific fishing activities especially adopted for highly priced fish species causes decline resulting in endangerment of that species.

Tourism and recreational activities

Anthropogenic activities due to tourism affect the aquatic habitats. Discharge of sewage, bathing and washing activities, cleaning of vehicles and dumping of other waste materials in the river affect the breeding grounds.

Introduced and exotic species

Introduced and exotic species have significant effect on the native fish populations. Competition for food with indigenous fishes, leading to niche overlap has considerably contributed to the decline of native species. *Tor khudree* and *Puntius carnaticus* earlier known to occur in numbers have reduced in population.

Management measures

The data based on the available population size and the distribution of native fauna should be prepared through extensive survey. Over fishing is also a cause for dwindling population and hence awareness should be created among fisher folks on sustainable use of fish resources. Human recreational activities associated to tourism that affect the fish habitats should be monitored and stringent laws be imposed to keep them under control. Investigation on invasive nature of exotic/introduced species in the natural habitats should be carried out to estimate as to how much they compete with the native fishes. Brooders of native fishes should be spared in the habitat to sustain indigenous fish population. Estimation of the fishery yield has to be done and database developed on the actual fishery resources could help in assessing the status of fishery.

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