

**Research Article**

## Conservation status of fish species at Pechiparai reservoir, Kanyakumari district of Tamil Nadu, India

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**ABSTRACT**

In the present investigation a total of 1844 fish specimens under 8 orders, 18 families and 41 genera and 65 species were collected from Pechiparai reservoir. The systematic checklist of fishes was prepared with note on common name, species abundance, habitat, length range, human utilization pattern, current fishery status and global conservation status. The catch per unit effort was maximum during the month of June 2016 (0.4942 kg/coracle/day) and minimum during the month of September 2016 (0.0403 kg/coracle/day). The conservation status of fishes reported at Pechiparai reservoir were Not evaluated for all 65 species by CITES; two species as Endangered (EN) and seven species as Vulnerable (VU) by NBFGR, India. The data obtained revealed one species as Endangered (EN), three species as Vulnerable (VU), seven species as Near Threatened (NT), forty eight species as Least Concern (LC), one species as Data Deficient (DD) and five species as Not Evaluated (NE) by IUCN.

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**INTRODUCTION**

Dam is a man-made ecosystem that alters the natural run off of the river. This often leads to instabilities in the riverine ecosystem such as change in water quality, sediment transport, distribution and abundance of aquatic flora and fauna and impact on migration of fishes (Dixitulu, 2010). The findings of Sarkar *et al.* (2011) suggested that the conservation of large river fishes should strive to maintain both erosional and depositional channel habitats with depths, substrates and current speeds inclusive of the ranges reported. In India, efforts have been made recently in bringing together the studies of fish diversity in various rivers with regard to fresh water habitat. However, fish diversity of many water bodies within protected area network and their importance in conservation of biodiversity is not studied well. Habitat restoration and rehabilitation; Ranching, stock enhancement and total harvestable catch; Community based conservation areas; Improvement of human resource, Capacity in fish biology & conservation; Identification of threat criteria; Conservation priority of the endangered species were considered as the management measures for effective conservation of fish diversity by Sarkar *et al.* (2011). Indian freshwater systems are in danger and needs urgent search of alternative techniques to enhance fish diversity through conservation and management protocols Sarkar *et al.* (2013). Mogalekar *et al.*, (2017a) recognized 267 fish species from West

Bengal and reported 17.97% of fish species that are under threatened or near threatened. He reported 13 fish species as invasive exotic fishes that has been emerging as a growing threat to fish diversity of the region. Pechiparai Dam is located at 43 kilometres away from Nagarcoil, Kanyakumari district in Tamil Nadu. It is built across the river Kodayar, the dam is one of the oldest existing dams in the state. The construction of this dam was started during 1895 and completed in 1906. The catchment area of the dam is 20,719.9 ha. The area of the reservoir is 36,836 ha. The length of the dam is 1831 feet.

**MATERIALS AND METHODS***Study area*

The investigation of ichthyofaunal diversity, along with catch per unit effort for commercially exploited species will convey the fish diversity, aid in predicting maximum sustainable yield that establish the catch limit, formulation of guidelines for the assuring the species composition and their conservation status for suggesting implementation of reservoir management practices. The specific objectives of the study are to investigate the fish species composition and

conservation status of fish species recorded in Pechiparai reservoir.

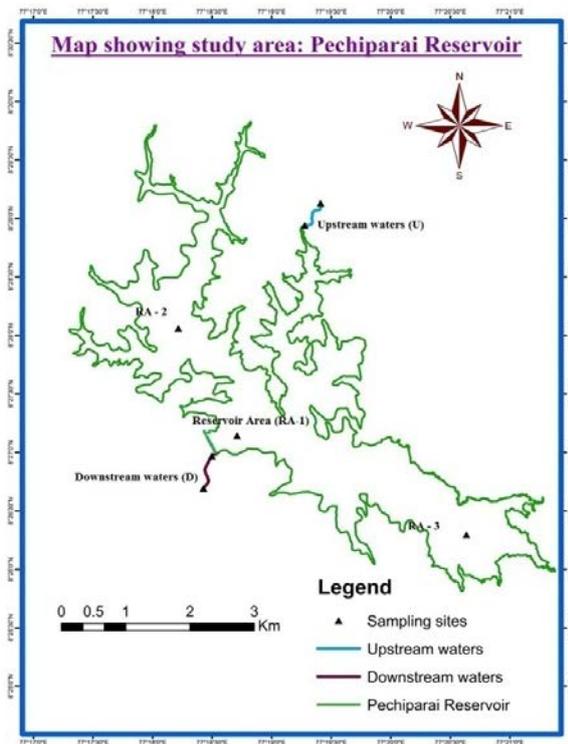


Figure 1: Map showing study area

### Fish sampling

Fishes were collected from five sampling stations at Pechiparai reservoir, i.e., three stations were from Pechiparai reservoir, named as Reservoir area (RA) RA-1 [Lat. 8°27'4.48" N, Long. 77°18'32.30" E], RA-2 [Lat. 8°28'7.09" N, Long. 77°18'9.21" E] and RA-3 [Lat. 8°26'17.17" N, Long. 77°20'26.53" E], respectively each with a circumference of 50m; fourth station is from upstream waters (U) and fifth station in the downstream waters (D) of Pechiparai reservoir (Figure 1). The upstream waters (US) were selected and sampled along the stretch of 500 m as distance covered from Lat. 8°29'50.39" N, Long. 77°18'1.90" E to Lat. 8°30'1.30" N, Long. 77°18'12.23" E. The downstream waters (DS) were selected and sampled along the stretch of 500 m as distance covered Lat. 8°26'58.18" N, Long. 77°18'29.90" E to Lat. 8°26'41.54" N, Long. 77°18'25.67" E. Sampling was done at each station once in a month by using gill net. The number of species caught was noted and the collected data were pooled together station wise as well as season wise during the study period.

### Catch Per Unit Effort

To assess the standing stock, total annual stock, maximum sustainable yield and to optimize the catch per unit effort, the required data were collected during the study period. The catch of commercial species was recorded in a fishing day and was multiplied with effort made in hours in the day of observation to obtain the daily estimates. The daily catch estimates multiplied by the number of fishing days of the corresponding month were used to estimate the

monthly catch. Total effort in fishing days was estimated by multiplying the mean monthly effort (Stamatopoulos, 2002).

### Conservation status

For conservation status assessment, the five criteria adopted and followed for categorizing the status which is in conformity with IUCN (2016) are listed as

- A. Declining population (Past, Present and / or projected)
- B. Geographic range size, and fragmentation, decline or fluctuations
- C. Small population size and fragmentation, decline or fluctuations
- D. Very small population or very restricted distribution
- E. Quantitative analysis of extinction risk

The different species recorded during the research work at Pechiparai reservoir were photographed by using standard camera having 13 mega pixel resolutions. The photographs were showed to the local fishers inhabiting in Pechiparai village for more than 25 years and interviewed fish landing data along with conservation status of the individual fishes as per the above mentioned criteria. The overall idea obtained from fishers were pooled to arrive the local conservation status of Pechiparai reservoir and checked for NBFGR (National Bureau of Fish Genetic Resources, India); IUCN (International Union for Conservation of Nature and Natural resources) and CITES (Convention on International Trade in Endangered Species) in order to assess the fishery status; Information on habitat of fishes was collected from fish base (Froese and Pauly, 2000) and Information on Human utilization pattern of fishes was collected from survey with local people for suggestive measures on conservation aspects for the fish species were worked out to resolve the problems.

### RESULTS

An intensive study was conducted for a period of one year from June 2016 to May 2017 to assess the ichthyofaunal diversity of Pechiparai reservoir in Kanyakumari district, Tamil Nadu. During the study period, 65 fish species were identified in the reservoir including upstream and downstream waters.

### Checklist of fishes recorded in Pechiparai reservoir

In total, a total of sixty five species of fishes belonging to 41 genera, 18 families and 8 orders have been recorded from Pechiparai reservoir including upstream and downstream waters. Among the 8 orders represented during the study period, order: Cypriniformes was found to be the most dominant one having 2 families (Cyprinidae and Cobitidae) which has 19 genera and 31 species followed by Siluriformes (5 families with 6 genera and 12 species); Perciformes (4 families with 6 genera and 9 species); Cyprinodontiformes (2 families with 3 genera and 5 species); Beloniformes (3 families with 3 genera and 3 species); Anguilliformes (1 family with 1 genera and 2 species); Synbranchiformes (1 family with 2 genera and 2 species) and Mugiliformes (1 family with 1 genera and 1 species). Based on the available data, a systematic checklist of fishes from fish samples collected during the study period.

The occurrence and abundance data collected in various orders of fish species were represented in the descending order as Cypriniformes (n=31) > Siluriformes (n=12) > Perciformes (n=9) > Cyprinodontiformes (n=5) > Beloniformes (n=3) > Anguilliformes (n=2) = Synbranchiformes (n=2) > Mugiliformes (n=1), where n stands for number of species encountered.

The occurrence and abundance data collected familywise, the fish species were represented in the descending order as Cyprinidae (n=30) > Bagridae = Cichlidae = Siluridae (n=4) > Poeciliidae (n=3) > Ambassidae = Anguillidae = Aplocheilidae = Channidae = Clariidae = Mastacembelidae (n=2) > Adrianichthyidae = Belonidae = Cobitidae = Gobiidae = Hemiramphidae = Heteropneustidae = Loricaridae = Mugilidae (n=1).

Among 1844 fish specimens, 533 (28.9%) non native exotic fishes were found in Pechiparai reservoir. The species abundance and percentage composition of the exotic fishes were tabulated in Table 1. Therefore the family wise contributions based on number of species collected, fish families were represented in descending order as Cichlidae (n=220) > Poeciliidae (n=216) > Cyprinidae (n=87) > Clariidae (n=8) > Loricariidae (n=2).

The environmental habitats (Froese and Pauly, 2000) of the recorded species were denoted as Freshwater (F), brackish water (B) and marine (M). Among these, 25 fish species were found primarily in freshwater system followed by 34 fish species in both freshwater and brackish water and rest 5 species [*Anguilla bicolor* (McClelland, 1844); *Anguilla bengalensis* (Gray, 1831); *Hyporhamphus xanthopterus* (Valenciennes, 1847); *Ambassis ambassis* (Lacepède, 1802) and *Glossogobius giurus* (Hamilton, 1822)] were found in all the environmental habitats like freshwater, brackish water and also in marine (Froese and Pauly, 2000). Human utilization pattern (Froese and Pauly, 2000) were classified into food fish, ornamental fish, food fish cum game fish and food fish cum ornamental. From the prepared checklist, 31 fish species are found to be ornamental in nature followed by 16 fish species found to be food fish used for human consumption, 12 species were found to be food cum ornamental fish and 6 species are food fish cum game fish. Fishery status (Froese and Pauly, 2000) was classified into Commercial (C), Minor Commercial (MC) and No interest (NI). From the checklist, 50 % of fishes fall under commercial category followed by 30 % and 20 % of minor commercial and of no interest, respectively.

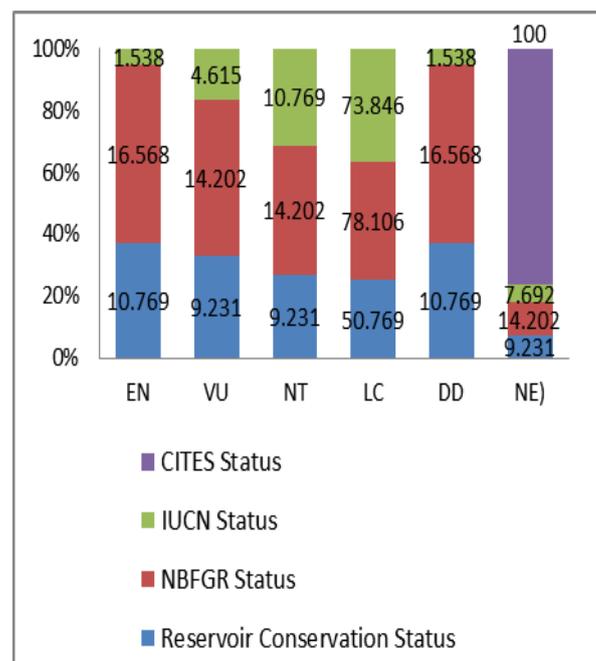
#### Catch Per Unit Effort (CPUE)

The calculated catch per unit effort (Table 2) was maximum during June 2016 (0.49 kg/coracle/day) followed by May 2017 (0.35 kg/coracle/day), March 2017 (0.34 kg/coracle/day) and minimum during September 2016 (0.04 kg/coracle/day) followed by October 2016 (0.07 kg/coracle/day). The present mean catch per unit effort is found to be  $0.223 \pm 0.137$  kg/coracle/day.

#### Conservation status of fish species

Threat status of all the fish species collected from Pechiparai reservoir were found to be 7 Endangered (EN) species (10.769%); 6 Vulnerable (VU) species (9.231%); 6 Near Threatened (NT) species (9.231%); 33 Least Concern (LC) species (50.769%); 7 Data Deficient (DD) species

(10.769%) and 6 Not Evaluated (NE) species (9.231%) as per information obtained from local fishers. As per IUCN comprises of one species (1.5384%) as Endangered (EN) namely, *Clarias magur* (Linnaeus, 1758); three species (4.6153%) as Vulnerable (VU) namely, *Cyprinus carpio* (Linnaeus, 1758); *Cirrhinus cirrhosus* (Bloch, 1795) and *Hyporhamphus xanthopterus* (Valenciennes, 1847); seven species (10.7692%) as Near Threatened (NT) namely, *Anguilla bengalensis* (Gray, 1831); *Anguilla bicolor* (McClelland, 1844); *Hypophthalmichthys molitrix* (Valenciennes, 1844); *Ompok bimaculatus* (Bloch, 1794); *Ompok pabda* (Hamilton, 1822); *Wallago attu* (Bloch & Schneider, 1801) and *Oreochromis mossambicus* (Peters, 1852); forty eight species (73.8461%) of Least Concern (LC); one species (1.5384%) as Data Deficient (DD) namely, *Puntius amphibius* (Valenciennes, 1842) and five species (7.6923%) of Not Evaluated (NE) namely, *Ctenopharyngodon idella* (Valenciennes, 1844); *Pterygoplichthys disjunctivus* (Weber, 1991); *Poecilia reticulata* (Peters, 1859); *Poecilia sphenops* (Valenciennes, 1846) and *Oreochromis niloticus* (Linnaeus, 1758). The fishery status from CITES were found to be Not Evaluated for all sixty five species recorded during the study in Pechiparai reservoir. The fishery status reported by National Bureau of Fish Genetic Resources (NBFGR), Lucknow, India were highlighted by using two different symbols for '#' for Endangered species and '◇' for vulnerable species. Threat status of fishes from Pechiparai reservoir as per NBFGR consists of *Dawkinsia tambraparniei* (Silas, 1954) and *Ompok malabaricus* (Valenciennes, 1840) comes under EN category. *Rhinomugil corsula* (Hamilton, 1822); *Heteropneustes fossilis* (Bloch, 1794); *Ompok pabda* (Hamilton, 1822); *Garra gotyla* (Gray, 1830); *Cirrhinus cirrhosus* (Bloch, 1795); *Puntius chola* (Hamilton, 1822) and *Systomus sarana* (Hamilton, 1822) under VU category and presented in Figure 2.



#### DISCUSSION

The collected fishes were identified up to species level and checklist of the identified ichthyofaunal species was given in Table 3.

### *Species diversity and composition*

The present investigation revealed presence of 65 fish species belonging to 8 orders, 18 families and 41 genera from the five sampling stations of Pechiparai reservoir including upstream and downstream areas from Kanyakumari district, Tamil Nadu. Comprehensive study on freshwater fish fauna of Tamil Nadu was recently conducted by Mogalekar and Jawahar (2017). According to them, Cypriniformes was the most dominant order and Cyprinidae was the most dominant family. Similarly, present study reveals the same pattern of dominance. The representation of fishes recorded in Pechiparai reservoir seems to be satisfactory throughout the study period when compared to Kingston (1992) and Kingston *et al.* (2006) from Kerala; Prateek *et al.* (2016) and Chrispin *et al.* (2016) from Tamil Nadu. Among the 18 families represented during the study period, Cyprinidae was found to be the most dominant family with 15 genera and 31 species. Shivashankar and Venkataramana (2012) documented 48 fish species under 28 genera and 14 families during the period from July 2010 to April 2011 in Bhadra River, Shimoga District of Karnataka. The Cyprinidae family was found to be dominant one (54.16%) in their study followed by Balitoridae and Bagridae having 4 species each (8.3%), Channidae, Chandidae and Siluridae having two species (4.1%) and rest of the 8 families having single species each (2.08%). The present study of the ichthyofaunal diversity was found to be in the same line as that of Sen (2003) from North eastern states of India that includes Manipur; Meghalaya; Mizoram; Nagaland and Tripura; Dua and Parkash (2009) from Punjab; Verma and Murmu (2010) from Jharkhand; Vats and Gupta (2011) from Haryana; Singh *et al.* (2012); Uchchariya *et al.* (2012); Yousuf *et al.* (2012); Vyas and Vishwakarma (2013); Vyas and Vishwakarma (2014); Shiv *et al.* (2015) from Madhya Pradesh; Niraj and Singh (2013) and Kumar (2015) from the state of Bihar; Baroet *et al.* (2014) from Assam; Choubey and Qureshi (2013); Mondalet *et al.* (2014); Pandey *et al.* (2014); Sahu (2015); Patel *et al.* (2016 a and b); Shrivastav and Singh (2017) from Chhattisgarh; Kingston (1992) and Kingston *et al.* (2006) from Kerala; Das *et al.* (2016) from Odisha and Mogalekar *et al.* (2017) from West Bengal. Behera and Nayak (2014) reported that the order Perciformes emerge as most dominant group followed by order Cypriniformes with 20 species under 12 families as distribution in Chilika lagoon. Sarkar *et al.* (2013) reported maximum of 87 fish species from protected area of River Gerua, Katarniaghat Wildlife Sanctuary and 59 fish species from unprotected areas of downstream waters of the river.

Prateek *et al.* (2016) reported seventeen species of freshwater fishes belonging to 8 families and 11 genera followed by Chrispin *et al.* (2016) recorded 13 fishes commonly available from the same reservoir dealt in this study. Sudhan *et al.* (2017) reported 60 fish species during their preliminary study on ichthyofaunal diversity assessment on Pechiparai reservoir. Therefore, the present study reveals an updated fish species checklist of 65 species covering upstream and downstream waters were recorded from Pechiparai reservoir, Kanyakumari district, Tamil Nadu. Khan *et al.* (2015) studied biodiversity of fish species from River Sone reveals that the Order - Siluriformes (16 species) was dominant followed by Cypriniformes (15 species), Perciformes (7 species), Mastacembeliformes, Clupeiformes

(2 species each) and Beloniformes(1 species). The species richness reported in the above studies as similar to the present diversity observed in Pechiparai reservoir.

### *Catch per unit effort estimation*

Gill net effort is usually calculated by multiplying the length of net by the length of time it was set. Catches are then standardized to units such as number of fish captured per meter-hour, or per 100 meter-days. There are some complicating factors with respect to length of time set. Catches can be expected to decline due to localized depletion of fish unless fish are very abundant or mobile, or both. Also, the efficiency of gill nets can decrease as fish accumulate in the net, a phenomenon known as gear saturation. The rate of saturation depends on the rate at which fish are caught, which in turn is typically related to fish abundance, so that catchability can be inversely related to density. Obviously, damage to (meshes) nets decreases their efficiency. Many researchers examined the influence of the length of net on catch per unit effort. Clearly, it is important to standardize gear and methods as much as possible if gill net catches are to be used as an index of abundance. Even with standardization, gill net catches are variable and large numbers of sets are likely to be required if the goal is to demonstrate statistically significant differences between locations or years. Teame *et al.* (2016) found that the highest catch was observed during December (96,535 kg) and lowest was recorded during January (65,046 kg) in Tekeze reservoir, Ethiopia. The lowest catch observed in this month was due to the fish mortality that occurred because of depletion of oxygen coupled with low levels of fishing operation during this month. The range of the CPUE for the four months was between 6.77 and 11.26 kg/boat/day. The highest CPUE was recorded in the month of January (11.26 kg/boat/day) and lowest in March (6.77 kg/boat/day) and the average CPUE for the four months were 8.27 kg/boat/day. The number of active boats/day was higher in the month of December (427) and lower in January (321). Bhakta *et al.* (2016) investigated the fish diversity and the study reveals that the range of CPUE for gill net was found to be 1.0-15.0 (kg/day) from Ukai reservoir, Gujarat. Hay *et al.* (2008) studied the Mean CPUE as number of fish caught per setting which decreased with increasing mesh size. For CPUE given as mass per setting, the opposite was found, as mean CPUE increased with increasing mesh sizes up to a maximum in the 73 and 93 mm mesh size, and thereafter decreasing again in the two largest mesh sizes (118 and 150 mm). Therefore, the present study reveals that the CPUE was maximum during June 2016 (1.1 kg) followed by July 2016, January 2017 (0.9 kg) and December 2016 (0.8 kg) which was due to monsoon season and the minimum during April 2017(0.4 kg) and May 2017 (0.3 kg) respectively due to loss of water in the reservoir and less dissolved oxygen. The undulated topography of fishing area in reservoir made fishermen not able to operate the nets in sustained or regular manner and the findings were similar to Bhakta *et al.* (2016) and Teame *et al.* (2016) due to low productivity and topographical conditions.

### *Conservation status of fish species*

Baro *et al.* (2014) who studied the conservation status according to IUCN status and the study showed that 1 species belongs to endangered category, 3 species near threatened, 1 species vulnerable, 32 species least concern, 3 species data deficient and 6 species not evaluated from Sonkosh River, Bodoland Territorial Council, Assam. According to Conservation Assessment and Management Plan (CAMP) Conservation status among 21 species, 2 were EN, 5 were VU, 10 were at lower risk- near threatened (LRnt) status, 1 lower risk least concern (LRlc) and 3 NE. The study also showed a tremendous decrease in the ichthyofaunal diversity of the lake Sagar during the last decade (Wani and Gupta, 2015). As per CAMP report, 4.65% of fishes belongs to LRlc, 39.53% LRnt, 27.91% VU, 18.61% NE and 9.30% EN category and according to the IUCN, 79.07% of the fishes belongs to LC, 16.28% NT and 4.65% DD respectively in River Sone (Khan *et al.* 2015). Sen (2003) investigated the fish diversity and stated that among 291 species, status of only 172 species have so far been evaluated, the rest 119 species were yet to be evaluated. The 172 evaluated species include 107 threatened species (9 Critically Endangered [CR], 40 EN, 57 VU and 1 extinct [EX] in wild); the rest 65 species are low risked (either LRlc or LRnt) from northeast India. Bakalial *et al.* (2014) collected 4 EN; 5 VU 22 NT and 16 DD, (respectively in numbers) fish species during the study in Lower Subansiri river drainage, Northeast India. Samal *et al.* (2016) investigated fish diversity in Budhabalanga River and their findings reveals the maximum (84.09%) species LC, followed by DD (9.09%), NT (4.55%) and (2.27%) VU species were recorded during the study period from June 2014 to November 2014 which was similar to the present study. Dua and Parkash, (2009) findings from Harike wetland (River Beas and River Sutlej) and results stated that, 1 CR, 4 EN and 13 VU fish species of India were found (IUCN, 2016) which was found to be similar to the present study in terms of percentage composition (Table 3).

## CONCLUSION

The study confirms the Pechiparai reservoir has its own positive potential diversity of fin fishes in upstream, downstream and reservoir waters yet, the production could be further increased by regular stocking of advanced fingerlings and culture based fisheries management

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**Table 1:** Species abundance and percentage composition of exotic fishes recorded in Pechiparai reservoir

Family	Exotic fish species	Species abundance (Nos.)	% composition
Cyprinidae	<i>Hypophthalmichthys molitrix</i> (Valenciennes, 1844)	27	5.07
	<i>Ctenopharyngodon idella</i> (Valenciennes, 1844)	28	5.25
	<i>Cyprinus carpio</i> (Linnaeus, 1758)	20	3.75
	<i>Carassius auratus</i> (Linnaeus, 1758)	2	0.38
	<i>Carassius carassius</i> (Linnaeus, 1758)	10	1.88
Poeciliidae	<i>Gambusia affinis</i> (Baird & Girard, 1853)	120	22.51
	<i>Poecilia reticulata</i> (Peters, 1859)	56	10.51
	<i>Poecilia sphenops</i> (Valenciennes, 1846)	40	7.50
Cichlidae	<i>Oreochromis mossambicus</i> (Peters, 1852)	200	37.52
	<i>Oreochromis niloticus</i> (Linnaeus, 1758)	20	3.75
Loricariidae	<i>Pterygoplichthys disjunctivus</i> (Weber, 1991)	2	0.38
Clariidae	<i>Clarias gariepinus</i> (Burchell, 1822)	8	1.50

**Table 2:** CPUE in Pechiparai reservoir, Kanyakumari district

Parameters	Months											
	Jun-16	Jul-16	Aug-16	Sep-16	Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17	Apr-17	May-17
No of active coracles /day	15	12	13	10	9	8	15	14	9	6	8	10
Fishing days / Month	28	28	28	28	28	28	28	28	28	28	28	28
Monthly catch (kg)	2076	1080	390	113	195	345	450	1155	530	586	519	1000
Mean daily catch (kg)	74.14	38.57	13.92	4.03	6.96	12.32	16.07	41.25	18.92	20.92	18.53	35.71
CPUE (kg/coracle/day)	0.49	0.32	0.10	0.04	0.07	0.15	0.10	0.29	0.21	0.34	0.23	0.35

**Table. 3:** Checklist of fishes from Pechiparai reservoir

Taxa	Scientific Name	Common Name	Species abundant (in numbers)	Habitat	Length range (cm)	Human utilization pattern	Current fishery status	Reservoir Conservation status	Global conservation Status	
									IUCN	CITES
Anguilliformes> Anguillidae	<i>Anguilla bengalensis</i> (Gray, 1831)	Indian mottled eel	1	F, M & B	80 - 200	Food fish / Game fish	C	EN	NT	NE
Anguilliformes> Anguillidae	<i>Anguilla bicolor</i> (McClelland, 1844)	Indonesian short fin eel	1	F, M & B	65 - 123	Food fish / Game fish	MC	EN	NT	NE
Beloniformes> Adrianichthyidae> Oryzinae	<i>Oryzias melastigma</i> (McClelland, 1839)	Rice fish	14	F & B	4 - 12	Ornamental	NI	LC	LC	NE
Beloniformes> Belonidae	<i>Xenentodon cancila</i> (Hamilton, 1822)	Freshwater garfish	45	F & B	15 - 45	Food fish / Ornamental	MC	LC	LC	NE
Beloniformes> Hemiramphidae	<i>Hyporhamphus xanthopterus</i> (Valenciennes, 1847)	Red tipped halfbeak	7	F, B & M	7 - 25	Food fish / Ornamental	NI	LC	VU	NE
Cypriniformes> Cobitidae> Cobitinae	<i>Lepidocephalichthys thermalis</i> (Valenciennes, 1846)	Common spiny loach	110	F	3-10.6	Ornamental	NI	DD	LC	NE
Cypriniformes> Cyprinidae	<i>Hypophthalmichthys molitrix</i> (Valenciennes, 1844)***	Silver carp	27	F	18 - 105	Food fish	C	LC	NT	NE
Cypriniformes> Cyprinidae> Danioninae (= Rasborinae)	<i>Salmostoma boopis</i> (Day, 1874)	Boopis razor belly minnow	5	F	8 - 12	Ornamental	NI	DD	LC	NE
Cypriniformes> Cyprinidae> Danioninae (= Rasborinae)	<i>Salmostoma balookee</i> (Sykes, 1839)	Bloch razor belly minnow	10	F	6 - 15	Ornamental	MC	DD	LC	NE
Cypriniformes> Cyprinidae> Danioninae (= Rasborinae)	<i>Salmophasia untrahi</i> (Day, 1869)	Mahanadi razor belly minnow	8	F	8 - 20	Ornamental	NI	DD	LC	NE
Cypriniformes> Cyprinidae> Danioninae (= Rasborinae)	<i>Laubuka dadiburjori</i> (Menon, 1952)	Dadio	2	F	2 - 2.5	Ornamental	NI	VU	LC	NE

Cypriniformes> Cyprinidae> Danioninae (= Rasborinae)	<i>Laubuka laubuca</i> (Hamilton, 1822)	Indian glass barb	3	F	4 - 7	Ornamental	C (Bait)	VU	LC	NE
Cypriniformes> Cyprinidae> Danioninae (= Rasborinae)	<i>Esomus thermoicos</i> (Valenciennes, 1842)	Barb	5	F	3 - 12.5	Ornamental	MC	NE	LC	NE
Cypriniformes> Cyprinidae> Danioninae (= Rasborinae)	<i>Rasbora daniconius</i> (Hamilton, 1822)	Slender rasbora	10	F & B	6 - 15.5	Ornamental	MC	LC	LC	NE
Cypriniformes> Cyprinidae> Danioninae (= Rasborinae)	<i>Rasbora rasbora</i> (Hamilton, 1822)	Gangetic scissortail rasbora	4	F & B	5 - 13	Ornamental	C	NE	LC	NE
Cypriniformes> Cyprinidae> Cyprininae	<i>Ctenopharyngodon idella</i> (Valenciennes, 1844) ***	Grass carp	28	F	58 - 79.2	Food fish	C	LC	NE	NE
Cypriniformes> Cyprinidae> Cyprininae	<i>Cyprinus carpio</i> (Linnaeus, 1758) ***	Common carp	20	F & B	25 - 36	Food fish / Game fish	C	LC	VU	NE
Cypriniformes> Cyprinidae> Cyprininae	<i>Carassius auratus</i> (Linnaeus, 1758) ***	Goldfish	2	F	5 - 48	Ornamental	C	LC	LC	NE
Cypriniformes> Cyprinidae> Cyprininae	<i>Carassius carassius</i> (Linnaeus, 1758) ***	Crussian carp	10	F & B	10 - 64	Food fish / Ornamental	C	LC	LC	NE
Cypriniformes> Cyprinidae> Cyprininae	<i>Puntius amphibious</i> (Valenciennes, 1842)	Scarlet-banded barb	35	F & B	6 - 17	Ornamental	MC	LC	DD	NE
Cypriniformes> Cyprinidae> Cyprininae	<i>Puntius bimaculatus</i> (Bleeker, 1863)	Red side barb	50	F & B	6 - 14	Ornamental	NI	LC	LC	NE
Cypriniformes> Cyprinidae> Cyprininae	<i>Pethia conchonius</i> (Hamilton, 1822)	Rosy barb	12	F	5.5 - 14	Ornamental	NI	LC	LC	NE
Cypriniformes> Cyprinidae> Cyprininae	<i>Dawkinsia filamentosa</i> (Valenciennes, 1844)	Black spot barb	40	F	6 - 18	Ornamental	C	LC	LC	NE
Cypriniformes>	<i>Systomus sarana</i>	Olive barb	25	F & B	8 - 42	Food fish /	MC	LC	LC	NE

Cyprinidae> Cyprininae	(Hamilton, 1822) ◊						Ornamental				
Cypriniformes> Cyprinidae> Cyprininae	<i>Puntius chola</i> (Hamilton, 1822) ◊	Swamp barb	3	F	6 - 15	Ornamental	C	NT	LC	NE	
Cypriniformes> Cyprinidae> Cyprininae	<i>Dawkinsia tamberparniei</i> (Silas, 1954) #	Arulius Barb	35	F	6 - 15	Ornamental	MC	LC	LC	NE	
Cypriniformes> Cyprinidae> Cyprininae	<i>Hypselobarbus kurali</i> (Menon&Rema Devi, 1995)	Kurali barb	5	F	7 - 17	Ornamental	MC	NT	LC	NE	
Cypriniformes> Cyprinidae> Cyprininae	<i>Hypselobarbus micropogon</i> (Valenciennes, 1842)	Korhi barb	2	F	6 - 16	Ornamental	MC	NT	LC	NE	
Cypriniformes> Cyprinidae> Cyprininae	<i>Cirrhinus cirrhosus</i> (Bloch, 1795)◊	Mrigal carp	10	F, B	40	Food fish	C	EN	VU	NE	
Cypriniformes> Cyprinidae> Cyprininae	<i>Cirrhinus mrigala</i> (Hamilton, 1822)	Mrigal	100	F	10 - 99	Food Fish	C	LC	LC	NE	
Cypriniformes> Cyprinidae> Cyprininae	<i>Catla catla</i> (Hamilton, 1822)	Catla	26	F	20 - 184	Food fish	C	LC	LC	NE	
Cypriniformes> Cyprinidae> Cyprininae	<i>Labeo calbasu</i> (Hamilton, 1822)	Orange fin labeo	45	F, B	12 - 90	Food fish	C	VU	LC	NE	
Cypriniformes> Cyprinidae> Cyprininae	<i>Labeo fimbriatus</i> (Bloch, 1795)	Fringed lipped peninsula carp	50	F	34-91	Food fish	C	DD	LC	NE	
Cypriniformes> Cyprinidae> Cyprininae	<i>Labeo rohita</i> (Hamilton, 1822)	Rohu	35	F	20 - 200	Food fish	C	LC	LC	NE	
Cypriniformes> Cyprinidae> Garrinae	<i>Garra mullya</i> (Sykes, 1839)	Sucker fish	2	F	7 - 17	Ornamental	NI	NT	LC	NE	
Cypriniformes> Cyprinidae> Garrinae	<i>Garra gotyla</i> (Gray, 1830) ◊	Sucker head	2	F	8 - 18	Ornamental	MC	EN	LC	NE	
Cyprinodontiformes> Aplocheilidae> Aplocheilinae	<i>Aplocheilus panchax</i> (Hamilton, 1822)	Blue panchax	39	F & B	5 - 9	Ornamental	MC	LC	LC	NE	

Cyprinodontiformes> Aplocheilidae> Aplocheilinae	<i>Aplocheilus lineatus</i> (Valenciennes, 1846)	Striped panchax	19	F & B	5 - 12	Ornamental	NI	LC	LC	NE
Cyprinodontiformes> Poeciliidae> Poeciliinae	<i>Gambusia affinis</i> (Baird & Girard, 1853) ***	Mosquito fish	120	F & B	3 - 7	Ornamental	MC	LC	LC	NE
Cyprinodontiformes> Poeciliidae> Poeciliinae	<i>Poecilia reticulata</i> (Peters, 1859) ***	Guppy	56	F & B	3 - 7	Ornamental	NI	NE	NE	NE
Cyprinodontiformes> Poeciliidae> Poeciliinae	<i>Poecilia sphenops</i> (Valenciennes, 1846) ***	Molly	40	F & B	3 - 6	Ornamental	NI	NE	NE	NE
Mugiliformes> Mugilidae	<i>Rhinomugil corsula</i> (Hamilton, 1822) ◊	Corsula	1	F & B	10 - 45	Food fish	C	NT	LC	NE
Perciformes>Percoidei> Ambassidae	<i>Ambassis ambassis</i> (Lacepède, 1802)	Commerson's glassy fish	5	F, B & M	4 - 12	Ornamental	NI	LC	LC	NE
Perciformes>Percoidei> Ambassidae	<i>Chanda nama</i> (Hamilton, 1822)	Elongate glass perchlet	12	F & B	5 - 11	Ornamental	MC	LC	LC	NE
Perciformes> Labroidei> Cichlidae	<i>Etilopius maculatus</i> (Bloch, 1795)	Orange chromidae	120	F & B	5 - 9	Ornamental	C	LC	LC	NE
Perciformes>Labroidei> Cichlidae	<i>Etilopius suratensis</i> (Bloch, 1790)	Pearl spot / Green chromidae	130	F & B	5 - 25	Food fish / Ornamental	C	LC	LC	NE
Perciformes> Labroidei> Cichlidae	<i>Oreochromis mossambicus</i> (Peters, 1852) ***	Mozambique tilapia	200	F & B	5 - 40	Food fish / Ornamental	C	LC	NT	NE
Perciformes> Labroidei> Cichlidae	<i>Oreochromis niloticus</i> (Linnaeus, 1758) ***	Nile tilapia	20	F & B	5 - 60	Food fish / Ornamental	C	NE	NE	NE
Perciformes> Gobioidei> Gobiidae> Gobiinae	<i>Glossogobius giuris</i> (Hamilton, 1822)	Tank goby	45	F, B & M	10 - 50	Food fish / Ornamental	MC	LC	LC	NE
Perciformes> Channoidei> Channidae	<i>Channa striata</i> (Bloch, 1793)	Striped snakehead	10	F & B	15 - 100	Food fish	C	LC	LC	NE
Perciformes> Channoidei> Channidae	<i>Channa punctata</i> (Bloch, 1793)	Spotted snakehead	5	F & B	10 - 35	Food fish / Ornamental	C	NT	LC	NE
Siluriformes> Bagridae	<i>Mystus armatus</i> (Day, 1865)	Kerala mystus	1	F & B	10 - 14.5	Ornamental	C	VU	LC	NE

Siluriformes> Bagridae	<i>Mystus cavasius</i> (Hamilton, 1822)	Gangetic mystus	5	F & B	15 - 40	Food fish	C	DD	LC	NE
Siluriformes> Bagridae	<i>Mystus gulio</i> (Hamilton, 1822)	Long whiskers catfish	8	F & B	15 - 45.6	Food fish	C	NE	LC	NE
Siluriformes> Bagridae	<i>Mystus vittatus</i> (Bloch, 1794)	Striped dwarf catfish	1	F & B	10 - 21	Food fish	MC	EN	LC	NE
Siluriformes> Loricariidae> Hypostominae	<i>Pterygoplichthys disjunctivus</i> (Weber, 1991)***	Vermiculated sail fin catfish	2	F	15 - 20.9	Ornamental	C	LC	NE	NE
Siluriformes> Siluridae	<i>Ompok bimaculatus</i> (Bloch, 1794)	Butter catfish	30	F & B	12 - 45	Food fish / Ornamental	MC	LC	NT	NE
Siluriformes> Siluridae	<i>Ompok malabaricus</i> (Valenciennes, 1840) #	Goan catfish	15	F	15 - 51	Food fish	MC	LC	LC	NE
Siluriformes> Siluridae	<i>Ompok pabda</i> (Hamilton, 1822) ◇	Pabdah catfish	4	F	13 - 45	Food fish	C	NT	NT	NE
Siluriformes> Siluridae	<i>Wallago attu</i> (Bloch & Schneider, 1801)	Wallago	1	F & B	50 - 250	Food fish / Game fish	C	EN	NT	NE
Siluriformes> Clariidae	<i>Clarias magur</i> (Linnaeus, 1758)	Philippine catfish / Indian walking catfish	3	F & B	15 - 55	Food fish	C	EN	EN	NE
Siluriformes> Clariidae	<i>Clarias gariepinus</i> (Burchell, 1822) ***	North African catfish	8	F	25 - 180	Food fish / Game fish	C	LC	LC	NE
Siluriformes> Heteropneustidae	<i>Heteropneustes fossilis</i> (Bloch, 1794) ◇	Stinging catfish	15	F & B	12 - 31	Food fish / Game fish	C	LC	LC	NE
Synbranchiformes> Mastacembeloidei> Mastacembelidae	<i>Macrognathus aral</i> (Bloch & Schneider, 1801)	One stripe spiny eel	3	F & B	10 - 63.5	Food fish / Ornamental	C	VU	LC	NE
Synbranchiformes> Mastacembeloidei> Mastacembelidae	<i>Mastacembelus armatus</i> (Lacepède, 1800)	Zigzag eel	2	F & B	25 - 90	Food fish / Ornamental	C	VU	LC	NE

**Abbreviations:**

\*\*\* Non endemic species; **F**: Freshwater, **B**: Brackish water; **M**: Marine water (Habitat); **C**: Commercial, **MC**: Minor Commercial, **NI**: of No Interest (Fishery Status); **NT**: Near Threatened, **LC**: Least Concern, **NE**: Not evaluated, **VU**: Vulnerable, **DD**: Data Deficient (Global Conservation Status); ◇: Vulnerable and #: Endangered fishery status reported by National Bureau of Fish Genetic Resources, India.