Original Research Article

ICTHYOFAUNAL DIVERSITY OF KAVVAI BACKWATERS, MALABAR COAST OF INDIA: A PRELIMINARY STUDY.

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ABSTRACT

Fish faunal diversity studies are of great importance for the effective utilization of the valuable natural resources and to plan out different conservation strategies. Studies on the diversity and richness of fishes of Kavvai backwaters are very rare. Hence this study is aimed to explore the fish resources, diversity and species richness of the fish fauna of Kavvai back water nouthern Kerala coast, which has not received very little attention hither to. Monthly sample collections were made from five stations regularly for a period of one year and the collection was done by netting with cast net and gill net. A total of 65 species under 51 genera comprising 36 families belonging to 17 orders of fin fish fauna were recorded from Kavvai backwater . Further studies are required to identify other fish species's and to ascertain the reasons for variations in fish faunal diversity of the Kavvai backwater ecosystem.

Keywords: Kavvayi backwater; fish fauna; Back water fishery ;diversity

1. INTRODUCTION

Inland water resources, such as lakes, rivers, canals, reservoirs, ponds, streams , springs, cave waters, floodplain wetlands, estuaries, coastal lagoons, mangrove creeks, marshes, backwaters, and swamps, provide habitat for fish, amphibians, water birds, semi-aquatic animals and plants, as well as highly endemic and endangered taxa.Climate regulation, flood mitigation, nutrient recycling, water purification, and waste management are all supported by these dynamic ecosystems. Millions of people around the world rely on them for food, nutrition, and survival [1]. Proper understandings of the fish fauna and their habitats are of great importance for the effective utilization of the valuable ecosystem and to plan out developmental and successive Management Programmes for their conservation [2].Today, fishing remains the largest extractive use of wildlife in the world. In 2010, the annual capture, combining both wild capture and aquaculture, was 149 million tonnes [3]. Fish is widely regarded as a superfood around the world. Fisheries and aquaculture is one of the fastest expanding food sectors, and it has played an important part in economic development due to its contributions to food and nutritional security, national income, job possibilities, and livelihood options.Fisheries sector occupies a very important place in the socio-economic condition of a country[4]. The fisheries production has registered an excellent growth during the past half century in India. Information is a very important constituent for the development of the sector, especially education, extension, research and development[5]. Fisheries and aquaculture continue to be an important source of food, nutrition, income, and liveivelihood for millions of people in India, accounting for 6.56 percent of global production and

contributing about 1% of the country's Gross Value Added (GVA) and over 5.37 percent of the country's agricultural GVA[6].Fish from India's fresh and marine waterways number 3231 legitimate species, accounting for 9.7% of the world's total of 33,059 species of fish, with marine fish diversity accounting for 7.4%.Marine fishes account for 75.6 percent of India's total fish variety, with 2443 species divided into 927 genera and 230 families divided into 40 orders[7]. India is the world's third-largest fish producer and the world's second-largest aquaculture fish producer. India accounts for roughly 7% of global fish production. The country is also home to more than 10% of the world's fish biodiversity and is one of the 17 countries with the most biodiversity.Around 14 million people work in the fishing industry and related industries[8]. The backwaters of Kerala are a unique ecosystem in Kerala wherein lagoons, lakes, canals, estuaries and deltas of several rivers meet the Arabian Sea. The backwaters are made up of over 900km of interconnected waterways, rivers, lakes and inlets [9]. The Kavvayi backwaters, also known as the Kavvayi Kayal, is a 21-kilometer-long elongated water body produced by drainages from four rivers: the Karingote, Nileswar, Kavvayi, and Peruvarnba. It is possibly the most visible element of the lacustrine system in northern Kerala's coastal tract.Edayilakad, Madackal, Vadakkekad, Chembantemedu, Oari, The kkekad, Purathal, Kockal, and other significant islets can be found in the backwater system [10].The ichthyofaunal diversity is a good indicator of health of aquatic ecosystem. A good piscine diversity represents the balanced ecosystem[11]. Proper understandings of the fish fauna and their habitats are of great importance for the effective utilization of the valuable ecosystem and to plan out developmental and successive management programmes for their conservation. Studies on the diversity and richness of fishes of Kavvai backwaters are rare. Likewise,fishery resource of Kavvai back water,Malabar region of Kerala coast has received only little attention hither to. This paper aims to explore the fish faunal diversity of Kavvai back water. This study also aims to find out various threats to fish fauna in Kavvai back waters.

2. MATERIALS AND METHODS

2.1.STUDY AREA : The Kavvai backwater (12.0929° N and 75.1677° E) is situated in the northern part of Kerala, in Kannur and Kasargod District of Kerala and has a permanent connection with the Arabian Sea on both in northern and southern side (Fig.1)[12]. The Karyamkode river, Peruvamba river, Kuniayan river and Valapattanam river drains into this water system .The backwater Kavvayi connected to Arabian Sea with the river mouth at the north at Azhithala, Nileswaram and connected to Palakkode river mouth in the south. There are 7 islands in the Kavvayi backwaters. Five (Kavvayi, Madakkal, Edayilekkad, Thekkekad and Vadakkekad) among them are having human settlements and two (Kocha Thuruthi and Kurippad Thuruthi) are not human settlements.

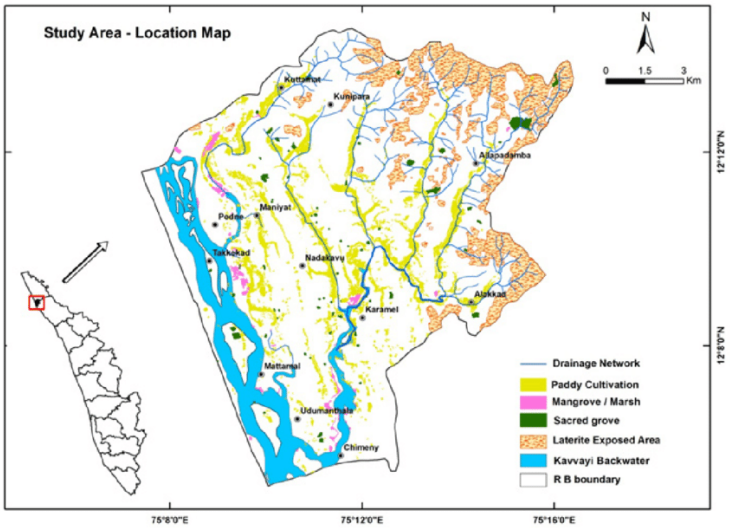

Figure 1 : Map showing study location

2.2.COLLECTION AND IDENTIFICATION OF FISHES

Fishes were collected from four sites of Kavvayi backwater (Fig.2) with the help of local fishermen using different type of nets namely gill nets, cast nets, and dragnets.Monthly collections were taken from five stations regularly for a period of one year. The collected fishes were washed and then stored in 7% formalin. Small fishes were directly placed in the 10% formalin solution. While large fishes were given an incision in their abdomen and preserved in the laboratory. Specimens were examined in detail characters were measured and fishes were identified up to the species level, with the help of standard keys given by Day (1878) [13]., Munro (1955) [14]., Talwar and Jhingran (1991) [15]., Jayaram (1981) [61]. , and Fischer and Bianchi (1984) [17].

a.

b.

c. d.

Fig.2. a,b,c and d Collection sites

3. RESULTS AND DISCUSSION

In the present study 65 species of fishes belonging to 36 families were found to occur in the study area. Among fishes Engraulidae was the most dominant family followed by Lutjanidae , Platycephalidae , Leiognathidae, Cichlidae and Clupeidae .The information collected in the present study are expected to act as a baseline data for future studies on the impact of the various factors, on the aquatic environment.The common name ,scientific name and family, in which the fish belongs ,is given in the Table -1. Percentage composition of various orders of fishes in Kavvai back water is showed in Fig. 3.

Table-1.Table showing common name ,scientific name and family of identified fish species

Sl No	COMMON NAME	SCIENTIFIC NAME	FAMILY
1	Asiatic glassfish.	*Ambassis ambassis (Lacepède, 1802)*	Ambassidae
2	Bald glassy	*Ambassis gymnocephalus (Lacepède 1802)*	Ambassidae
3	Thread fin sea catfish	*Arius arius (Hamilton 1822)*	Ariidae
4	Kerala mystus	*Mystus armatus (Day 1865)*	Bagridae
5	Long whiskered mystus	*Mystus seengtee (Sykes 1839)*	Bagridae
6	Coastal trevally	*Carangoides coeruleopinnatus (Rüppell 1830)*	Carangidae
7	Milkfish	*Chanos chanos (Forsskål 1775)*	Chanidae
8	Orange chromide	*Pseudetroplus maculatus (Bloch 1795)*	Cichlidae
9	Mozambique tilapia	*Oreochromis mossambicus (Peters 1852)*	Cichlidae
10	Pearlspot	*Etroplus suratensis (Bloch 1790)*	Cichlidae
11	Toli shad	*Tenualosa toli (Valenciennes 1847)*	Clupeidae
12	Arabian gizzard shad	*Nematalosa arabica Regan 1917*	Clupeidae
13	White sardine	*Escualosa thoracata (Valenciennes 1847)*	Clupeidae
14	Malabar tonguesole	*Cynoglossus macrostomus Norman 1928*	Cynoglossidae
15	Bengal tongue sole	*Cynoglossus cynoglossus (Hamilton 1822)*	Cynoglossidae

16	Surf perch	*Amphistichus sp.*	Embiotocidae
17	Moustached thryssa	*Thryssa mystax (Bloch & Schneider 1801)*	Engraulidae
18	Indian anchovy	*Stolephorus indicus (van Hasselt 1823)*	Engraulidae
19	Malabar thryssa	*Thryssa malabarica (Bloch 1795)*	Engraulidae
20	Hamilton's thryssa	*Thryssa hamiltonii Gray 1835*	Engraulidae
21	Orangemouth anchovy	*Thryssa vitrirostris (Gilchrist & Thompson 1908)*	Engraulidae
22	Short anchovy	*Anchoa curta (Jordan & Gilbert 1882)*	Engraulidae
23	long-rayed silver biddy	*Gerres filamentosus*	Gerreidae
24	Deep-bodied mojarra	*Gerres erythrourus (Bloch 1791)*	Gerreidae
25	Racer goby	*Babka gymnotrachelus*	Gobiidae
26	Yellowfin goby	*Acanthogobius flavimanus (Temminck & Schlegel 1845)*	Gobiidae
27	Lutke's halfbeak	*Hemiramphus lutkei (Valenciennes, 1847)*	Hemiramphidae
28	Günther's catfish	*Horabagrus brachysoma (Günther 1864)*	Horabagridae
29	False trevally	*Lactarius lactarius (Bloch & Schneider 1801)*	Lactaridae
30	Barramundi	*Lates calcarifer (Bloch 1790)*	Latidae
31	Deep pugnose ponyfish	*Secutor ruconius (Hamilton, 1822)*	Leiognathidae
32	Common Ponyfish	*Leiognathus equulus (Forsskal, 1775)*	Leiognathidae
33	Twoblotch ponyfish	*Nuchequula blochii (Valenciennes 1835)*	Leiognathidae
34	Shortnose ponyfish	*Leiognathus brevirostris (Valenciennes 1835)*	Leiognathidae
35	Mangrove red snapper	*Lutjanus argentimaculatus (Forsskål 1775)*	Lutjanidae
36	John's snapper	*Lutjanus johnii (Bloch 1792)*	Lutjanidae
37	Blacktail snapper	*Lutjanus fulvus (Forster 1801)*	Lutjanidae
38	Mangrove red snapper	*Lutjanus argentiventris (Peters1869)*	Lutjanidae
39	Onespot Snapper	*Lutjanus monostigma (Cuvier 1828)*	Lutjanidae
40	Indo-Pacific tarpon	*Megalops cyprinoides (Broussonet, 1782)*	Megalopidae
41	Flat-tail mullet	*Gracilimugil argenteus (Quoy & Gaimard, 1825)*	Mugilidae
42	Flat head grey mullet	*Mugil cephalus Linnaeus 1758*	Mugilidae
43	Bluespot mullet	*Crenimugil seheli (Forsskål 1775)*	Mugilidae
44	Sulphur goatfish	*Upeneus sulphureus Cuvier 1829*	Mullidae
45	Indian pike conger	*Congresox talabonoides (Bleeker 1853)*	Muraenesocidae
46	Serpent eel	*Ophisurus serpens (Linnaeus 1758)*	Ophichthidae
47	snake eel	*Muraenichthys gymnopterus (Bleeker 1853)*	Ophichthidae
48	Bartail flathead	*Platycephalus indicus (Linnaeus 1758)*	Platycephalidae
49	Bartail flathead	*Platycephalus indicus (Linnaeus 1758)*	Platycephalidae
50	Dusky flathead	*Platycephalus fuscus Cuvier 1829*	Platycephalidae
51	Southern bluespotted flathead	*Platycephalus speculator Klunzinger 1872*	Platycephalidae
52	Small-eyed flathead	*Cymbacephalus bosschei (Bleeker 1860)*	Platycephalidae
53	Peppered flounder	*Paralichthodes algoensis Gilchrist 1902*	Pleuronectidae
54	Indian pellona	*Pellona ditchela Valenciennes, 1847*	Pristigasteridae
55	Spotted scat	*Scatophagus argus (Linnaeus)*	Scatophagidae
56	Spotbanded scat	*Selenotoca multifasciata (Richardson 1846)*	Scatophagidae
57	Southern meagre	*Argyrosomus hololepidotus (Lacepède, 1801)*	Sciaenidae
58	Indo-Pacific king mackerel	*Scomberomorus guttatus (Bloch & Schneider 1801)*	Scombridae

59	Malabar grouper	*Epinephelus malabaricus (Bloch & Schneider, 1801)*	Serranidae
60	Vermiculated spinefoot	*Siganus vermiculatus (Valenciennes 1835)*	Siganidae
61	Silver sillago	*Sillago sihama (Forsskål 1775)*	Sillaginidae
62	Oriental sole	*Brachirus orientalis (Bloch & Schneider 1801)*	Soleidae
63	TheYellowtail Barracuda	*Sphyraena obtusata Cuvier, 1829*	Sphyraenidae
64	Jarbua terapon	*Terapon jarbua (Forsskål 1775)*	Terapontidae
65	Largehead hairtail	*Trichiurus lepturus Linnaeus 1758*	Trichiuridae

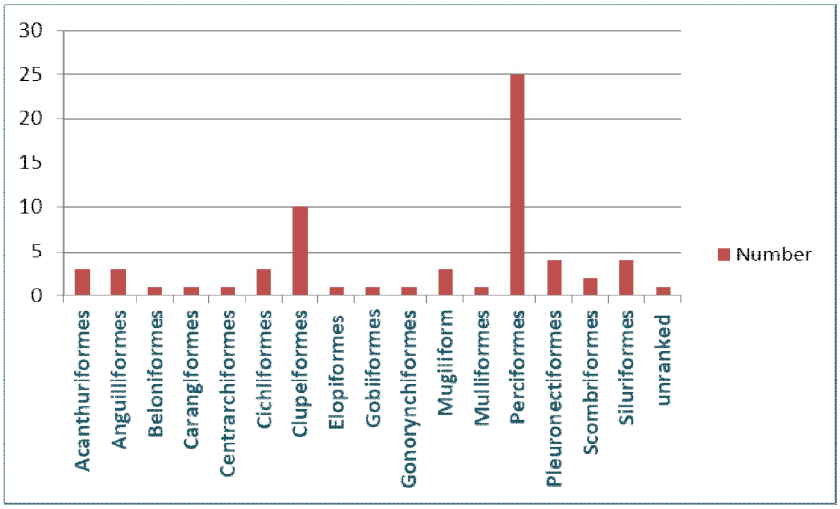

Fig.3.Percentage composition of various orders of fishes in Kavvai backwater

SI.No.	FAMILY	Number
1	Ambassidae	2
2	Ariidae	1
3	Bagridae	2
4	Carangidae	1
5	Chanidae	1
6	Cichlidae	3
7	Clupeidae	3
8	Cynoglossidae	2
9	Embiotocidae	1
10	Engraulidae	6
11	Gerreidae	2
12	Gobiidae	2
13	Hemiramphidae	1
14	Horabagridae	1

15	Lactaridae	1
16	Latidae	1
17	Leiognathidae	4
18	Lutjanidae	5
19	Megalopidae	1
20	Mugilidae	3
21	Mullidae	1
22	Muraenesocidae	1
23	Ophichthidae	2
24	Platycephalidae	5
25	Pleuronectidae	1
26	Pristigasteridae	1
27	Scatophagidae	2
28	Sciaenidae	1
29	Scombridae	1
30	Serranidae	1
31	Siganidae	1
32	Sillaginidae	1
33	Soleidae	1
34	Sphyraenidae	1
35	Terapontidae	1
36	Trichiuridae	1

Table.2.Composition of various family of fishes in Kavvai back water

4. CONCLUSION

The kavvayi backwater, is kerala's third largest and the largest in north kerala and are rich in religious, ecological, genetic, environmental, and economic potentials.

This backwater in northern Kerala, known as Kavvayi Kayal, is supplied by five rivers: the River Kavvayi and its tributary streams Kankol, Vannathichal, Kuppithodu, and Kuniyan.The backwater of Kavvayi and its surrounding region are deemed ecologically significant. The current study was carried out to establish an inventory of fishfaunal diversity in Kavvayi backwater, a major ecological variety rich location in Payyanur in the Indian state of Kerala.The diversity of the ichthyofauna is a reliable measure of the health of the aquatic ecosystem. A diverse population of fish indicates a healthy ecosystem.In the present study 65 species of fishes belonging to 36 families were found to occur in the study area. Among fishes Engraulidae was the most dominant family followed by Lutjanidae , Platycephalidae , Leiognathidae ,Cichlidae and Clupeidae.The data gathered in this study will serve as a baseline for future research on the effects of numerous influences on the aquatic environment.Effective use of this data in policy creation, management, research, and conservation could, at many levels, assist to alleviate the current situation in light of the growing pressure that diverse human activities are placing on water resources. The current

research and development plan is insufficient for the conservation, development, and management of this complex aquatic environment.Fish life can be harmed by changes in the environment. Human activities affect backwater fish fauna in a variety of ways. Chemical pollution and littering, as well as urbanization, industrialization, dam construction, river diversion, and sand mining, have all been discovered to have a substantial impact on the fate of thousands of back water fish species. More knowledge on this aquatic ecosystem in sustaining fisheries is required.To maintain the fish faunal diversity of this aquatic ecosystem continuous monitoring is needed.

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