

# Fishes in Vellayani Freshwater Lake, Kerala, Southwest Coast of India

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**Abstract:** Vellayani Lake is the largest fresh water lake in Thiruvananthapuram district, and is the second largest fresh water lake in Kerala, Southwest coast of India. This freshwater lake is well studied in the past for its water quality parameters but scarcely its biodiversity. The latest publication of Bijukumar and Pramod Kiran (2013), a study from the participatory fish census conducted at Vellayani Lake, reported that there were 42 species of Fishes there. But the present study (from 2013 to 2018) revealed a total of 69 Species of fishes present in this lake. Fishes were identified using standard keys.

**Keywords:** Small indigenous fishes, Vellayani fresh water Lake

## 1. Introduction

People have traditionally depended on various varieties of indigenous fish species are the source of nutritious food, which are easily available from nearby water bodies. Small fishes are the commonly consumed proteinaceous food items, forming the integral part of the everyday carbohydrate-rich diet of common people. They are the rich source of animal protein, fatty acids and essential vitamins and minerals (ICSF, 2010).

The lakes of Kerala are peculiar in a sense that a number of rivers open into them. The Western Ghats are also well known for their richness of biodiversity of fresh water fish species. Many rivers, rivulets, streams, etc., are originated from the Western Ghats which are the resources of these species. The most endangered ecosystems in the world are freshwater ecosystems (Sala *et al.* 2000). The aquatic ecosystems in Kerala are home to a vast variety of fish species. The home of different fish species are also the Paddy fields of this small state.

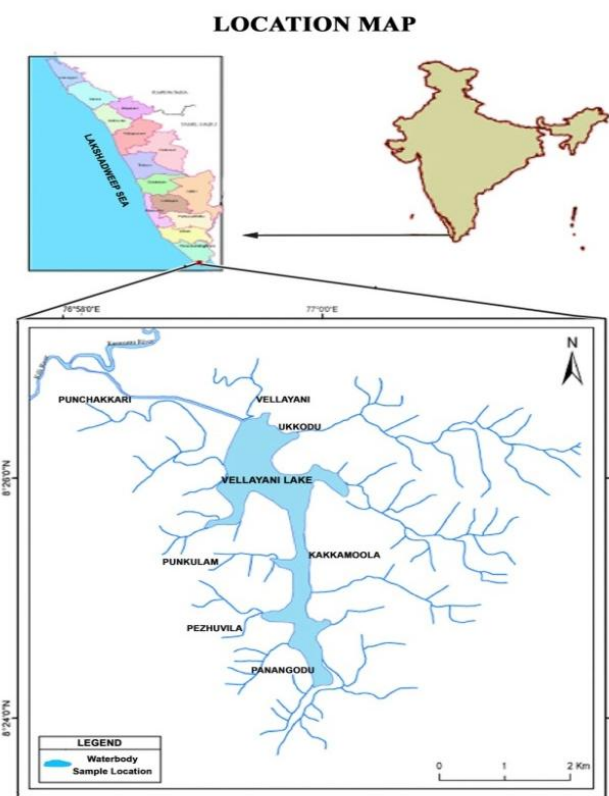
In 2013, about 42 species of fishes have been documented from the lake by Bijukumar *et al.*, from the Department of Aquatic Biology and Fisheries, University of Kerala, in a fish census study. This fish census of the lake was carried out to generate a baseline data to facilitate continuous monitoring of fish diversity. In this context, the present study on the fish diversity of the lake is an inevitable step forward to assess the present fish diversity status, more precisely on a long time basis.

## 2. Materials and Methods

### 2.1 Study Area

For the present study, the whole Vellayani fresh water Lake (8° 24' 09"- 8° 26' 30"N and 76° 59' 08"- 76° 59' 47" E) was selected as the study area. The livelihood of about 150 traditional fishermen depends on the fish resources of Vellayani Lake. The indirect benefits such as provision of drinking water and support to tourism notwithstanding, Vellayani Lake and associated wetland ecosystems supports a large human population that derives its income directly from activities like fishing, floriculture and agricultural

production. Special emphasis was made on the four selected stations, namely Panangodu, Vavvamoola, Kakkamoola and Oorkodu as the regions where fishing activities thrive.



**Fig. 1**

**Figure 1:** Map of the Vellayani Freshwater Lake

### 2.2 Sample Collection

Most of the commercially important and almost large sized fish samples were collected from the 'Matsya Vipanana Kendram' situated at Kakkamoola, Kayalkara Junction, eastern side of the Lake under the control of 'Vellayani Kayal Matsyathozhilali Vikasanakshema Sahakarana Sangham, Kakkamoola' during a period of 4 years from 2013 to 2018. The fishermen bring their fish catches to this society. Very small sized species having ornamental value were collected by using cotton cloths from the fringe areas of the lake with the help of an assistant. The collected fishes were sorted, counted and measured using a graduated board,

in the field itself. Each sample from each species was preserved in 5% formalin.

### 2.3 Identification of Fishes

Fishes were identified using standard keys of Talwar & Jhingran (1991); Easa & Shaji (2003); Armbruster *et al.* (2006); Biju Kumar and Pramod Kiran (2013), Jayaram (2013) and the data available from the websites such as Wickipedia, Fish base, IUCN Red List and WORMS.

### 3. Results and Discussions

The present study reported that a total of 69 species under 49 genera comprising 30 families belonging to 13 Orders are present in the Lake. Systematic position including Order, Family, Genus and Species of all fishes are presented in the Table I.

**Table 1:** Systematic position of the fishes from Vellayani Fresh water Lake

Sl. No.	Order	Family	Genus	Species
1	Anguilliformes	Anguillidae	<i>Anguilla</i>	<i>Anguilla bengalensis</i>
2	Anguilliformes	Anguillidae	<i>Anguilla</i>	<i>Anguilla bicolor</i>
3	Beloniformes	Adrianichthyidae	<i>Oryzias</i>	<i>Oryzias setnai</i>
4	Beloniformes	Belonidae	<i>Xenentodon</i>	<i>Xenentodon cancula</i>
5	Beloniformes	Hemiramphidae	<i>Hyporhamphus</i>	<i>Hyporhamphus xanthopterus</i>
6	Characiformes	Characidae	<i>Piaractus</i>	<i>Piaractus brachypomus</i>
7	Clupeiformes	Clupeidae	<i>Dayella</i>	<i>Dayella malabarica</i>
8	Cypriniformes	Cobitidae	<i>Lepidocephalichthys</i>	<i>Lepidocephalichthys thermalis</i>
9	Cypriniformes	Cyprinidae	<i>Amblypharyngodon</i>	<i>Amblypharyngodon melettinus</i>
10	Cypriniformes	Cyprinidae	<i>Amblypharyngodon</i>	<i>Amblypharyngodon microlepis</i>
11	Cypriniformes	Cyprinidae	<i>Catla</i>	<i>Catla catla</i>
12	Cypriniformes	Cyprinidae	<i>Cirrhinus</i>	<i>Cirrhinus cirrhosus</i>
13	Cypriniformes	Cyprinidae	<i>Cyprinus</i>	<i>Cyprinus carpio</i>
14	Cypriniformes	Cyprinidae	<i>Dawkinsia</i>	<i>Dawkinsia filamentosus</i>
15	Cypriniformes	Cyprinidae	<i>Devario</i>	<i>Devario malabaricus</i>
16	Cypriniformes	Cyprinidae	<i>Garra</i>	<i>Garra mullya</i>
17	Cypriniformes	Cyprinidae	<i>Horadandia</i>	<i>Horadandia attukoralai</i>
18	Cypriniformes	Cyprinidae	<i>Labeo</i>	<i>Labeo rohita</i>
19	Cypriniformes	Cyprinidae	<i>Pethia</i>	<i>Pethiaticto</i>
20	Cypriniformes	Cyprinidae	<i>Puntius</i>	<i>Puntius vittatus</i>
21	Cypriniformes	Cyprinidae	<i>Puntius</i>	<i>Puntius dorsalis</i>
22	Cypriniformes	Cyprinidae	<i>Puntius</i>	<i>Puntius mahecola</i>
23	Cypriniformes	Cyprinidae	<i>Pethia</i>	<i>Puntius parrah</i>
24	Cypriniformes	Cyprinidae	<i>Systemus</i>	<i>Systemus sarana subnasutus</i>
25	Cypriniformes	Cyprinidae	<i>Rasbora</i>	<i>Rasbora dandia</i>
26	Cyprinodontiformes	Aplocheilidae	<i>Aplocheilus</i>	<i>Aplocheilus lineatus</i>
27	Cyprinodontiformes	Aplocheilidae	<i>Aplocheilus</i>	<i>Aplocheilus panchax</i>
28	Cyprinodontiformes	Aplocheilidae	<i>Aplocheilus</i>	<i>Aplocheilus parvus</i>
29	Elopiformes	Megalopidae	<i>Megalops</i>	<i>Megalops cyprinoides</i>
30	Gonorynchiformes	Chanidae	<i>Chanos</i>	<i>Chanos chanos</i>
31	Mugiliformes	Mugilidae	<i>Mugil</i>	<i>Mugil cephalus</i>
32	Perciformes	Ambassidae	<i>Ambassis</i>	<i>Ambassis ambassis</i>
33	Perciformes	Ambassidae	<i>Ambassis</i>	<i>Ambassis nalua</i>
34	Perciformes	Ambassidae	<i>Ambassis</i>	<i>Ambassis gymnocephalus</i>
35	Perciformes	Ambassidae	<i>Parambassis</i>	<i>Parambassis dayi</i>
36	Perciformes	Ambassidae	<i>Parambassis</i>	<i>Parambassis thomassi</i>
37	Perciformes	Anabantidae	<i>Anabas</i>	<i>Anabas testudineus</i>
38	Perciformes	Belontiidae	<i>Pseudosphromenus</i>	<i>Pseudosphromenus cupanus</i>
39	Perciformes	Belontiidae	<i>Pseudosphromenus</i>	<i>Pseudosphromenus dayi</i>
40	Perciformes	Carangidae	<i>Caranx</i>	<i>Caranx ignobilis</i>
41	Perciformes	Carangidae	<i>Caranx</i>	<i>Caranx tille</i>
42	Perciformes	Cichlidae	<i>Etroplus</i>	<i>Etroplus maculatus</i>
43	Perciformes	Cichlidae	<i>Etroplus</i>	<i>Etroplus suratensis</i>
44	Perciformes	Cichlidae	<i>Oreochromis</i>	<i>Oreochromis mossambicus</i>
45	Perciformes	Channidae	<i>Channa</i>	<i>Channa marulius</i>
46	Perciformes	Channidae	<i>Channa</i>	<i>Channa orientalis</i>
47	Perciformes	Channidae	<i>Channa</i>	<i>Channa striata</i>
48	Perciformes	Eleotridae	<i>Eleotris</i>	<i>Eleotris fusca</i>
49	Perciformes	Gerreidae	<i>Gerres</i>	<i>Gerres filamentosus</i>
50	Perciformes	Gobiidae	<i>Awaous</i>	<i>Awaous grammepomus</i>
51	Perciformes	Gobiidae	<i>Glossogobius</i>	<i>Glossogobius giuris</i>
52	Perciformes	Gobiidae	<i>Pseudogobius</i>	<i>Pseudogobius javanicus</i>
53	Perciformes	Gobiidae	<i>Stenogobius</i>	<i>Stenogobius gymnopomus</i>
54	Pleuronectiformes	Soleidae	<i>Brachirus</i>	<i>Brachirus orientalis</i>

55	Siluriformes	Bagridae	<i>Mystus</i>	<i>Mystus bleekeri</i>
56	Siluriformes	Bagridae	<i>Mystus</i>	<i>Mystus montanus</i>
57	Siluriformes	Bagridae	<i>Mystus</i>	<i>Mystus oculatus</i>
58	Siluriformes	Clariidae	<i>Clarias</i>	<i>Clarias gariepinus</i>
59	Siluriformes	Heteropneustidae	<i>Heteropneustes</i>	<i>Heteropneustes fossilis</i>
60	Siluriformes	Heteropneustidae	<i>Heteropneustes</i>	<i>Heteropneustes microps</i>
61	Siluriformes	Loricariidae	<i>Pterigoplichthys</i>	<i>Pterigoplichthys pardalis</i>
62	Siluriformes	Loricariidae	<i>Pterigoplichthys</i>	<i>Pterigoplichthys disjunctivus</i>
63	Siluriformes	Pangasiidae	<i>Pangasianodon</i>	<i>Pangasianodon hypophthalmus</i>
64	Siluriformes	Siluridae	<i>Ompok</i>	<i>Ompok bimaculatus</i>
65	Siluriformes	Siluridae	<i>Ompok</i>	<i>Ompok malabaricus</i>
66	Siluriformes	Siluridae	<i>Wallago</i>	<i>Wallago attu</i>
67	Synbranchiformes	Mastacembelidae	<i>Mastacembelus</i>	<i>Mastacembelus armatus</i>
68	Synbranchiformes	Synbranchidae	<i>Monopterus</i>	<i>Monopterus albus</i>
69	Synbranchiformes	Synbranchidae	<i>Ophisternon</i>	<i>Ophisternon bengalense</i>

The present study reported a total of 69 Species under 49 Genera comprising 30 Families belonging to 13 Orders. The latest publication of Bijukumar and Pramod Kiran (2013), a study from the participatory fish census conducted at Vellayani Lake, reported that there were 42 species of Fishes there. Of these, Indian mottled eel (*Anguilla bengalensis*), Valenciennes clariid or Mushi (*Clarias dussumieri*) and Crocodile tooth pipefish (*Microphis cunclus*) were absent at the time of participatory fish census, which were earlier reported from the lake. These species were absent in the present study also.

The present study showed that all the 69 species of fishes belonged in 13 different Orders. Twenty two species dominated in the Order Perciformes, followed by 18 species in Cypriniformes, 12 in Siluriformes, 3 each in Beloniformes, Cyprinodontiformes and Synbranchiformes, 2 in Anguilliformes and 1 species each in Characiformes, Clupeiformes, Elopiformes, Gonorynchiformes, Mugiliformes and Pleuronectiformes.

#### 4. Conclusion

The ichthyofaunal diversity of the lake is comparatively rich with a total of 69 species under 49 Genera comprising 30 Families belonging to 13 Orders. In the present context of deterioration of inland water bodies and the consequent population reduction of indigenous species of fishes across most parts of the country, it is important to conserve Vellayani Lake with proper management strategies, especially to prevent the population reduction of the fairly good number of indigenous species in the lake. Vellayani Lake is important for its fish biodiversity and its great socioeconomic value to the local community.

#### References

- [1] Armbruster, J.W. and Page, L.M. 2006. Redescription of *P. punctatus* and description of a new species of *Pterigoplichthys* (Siluriformes: Loricariidae). *Neotrop. Ichthyol.*, 4: 401-409.
- [2] Biju Kumar, A and Pramod Kiran, R.B. 2013. *Fish Diversity of Vellayani Lake: A Field Guide*. Dept. of Aquatic Biology and Fisheries, University of Kerala, TVPM, Kerala.
- [3] Easa, P.S. and Shaji, C.P. 2003. *Division of Wildlife Biology, Biodiversity Documentation for Kerala*. Part 8:

Freshwater Fishes, Kerala Forest Research Institute, An Instruction of State Council for Science, Technology and Environment Peechi – 680 653, Kerala, India.

- [4] ICSF, 2010. International Collective in Support of Fishworkers. *Recasting the Net: Defining a Gender Agenda for Sustaining Life and Livelihoods in Fishing Communities*. Report. www.icsf.net
- [5] Jayaram, K.C., 2013. *The Freshwater Fishes of the Indian Region. Revised second edition*. Narendra Publishing House, Delhi, India. ISBN:978-81-907952-1-0.
- [6] Sala, O.E., Chapin, F.S., Armesto, J.J., Berlow, E., Bloomfield, J., Dirzo, R., Huber-Sanwald, E., Huenneke, L.F., Jackson, R.B., Kinzig, A., Leemans, R., Lodge, D.M., Mooney, H.A., Oesterheld, M., Poff, N.L., Sykes, M.T., Walker, B.H., Walker, M. and Wall, D.H. 2000. Biodiversity – global biodiversity scenarios for the year 2000. *Science.*, 287 : 1770 - 1774.
- [7] Talwar, P.K and Jhingran, A.G., 1991. *Inland Fishes of India and Adjacent Countries*, Vol. I and II, Oxford and IBH Pub. Co PVT LTD. New Delhi.

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