



Ichthyofaunal Diversity Of Akeru River - Khammam (D) Telangana, India.

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ABSTRACT

Ichthyofaunal diversity is a crucial component of global biodiversity and ecosystem health. Protecting and understanding fish diversity is vital for maintaining ecological balance, supporting human economies, and ensuring the resilience of aquatic environments in the face of environmental changes. Through concerted conservation efforts and sustainable practices, it is possible to preserve the rich diversity of fish species for future generations. It encompasses the different species, their abundance, and the overall ecological balance within aquatic environments at akeru river. Ichthyofaunal diversity plays a crucial role in maintaining the balance of aquatic ecosystems. Fish species contribute to nutrient cycling, control populations of prey species, and serve as indicators of environmental health. Species ranges may shift, leading to altered community compositions and potential loss of endemic species. Conservation strategies need to consider the long-term effects of climate change on ichthyofaunal diversity. his diversity is essential for maintaining ecological balance, supporting human livelihoods, and indicating the health of aquatic ecosystems.

Keywords: Ichthyofaunal diversity, Species, Aquatic ecosystem, compositions, akeru river

INTRODUCTION

The Akeru River starts from Nashkal in Warangal district. It flows through Mahabubabad and goes into Khammam. When it reaches Khammam, it joins the Akeru River (a left tributary of the Krishna) at Theerdhala village in Khammam Rural mandal. "Ichthyodiversity" is a scientific term which is used for fish diversity or referred to the variety of fish species (Burton et al., 1992) Fish are super important in and help humans indirectly or directly. They're a good source of proteins, vitamins, and minerals for our diets. Plus, they give lots of people jobs and money all around the world. In total, there are 8,411 different kinds of freshwater fish globally. India alone has recorded 930 kinds of fish in its freshwater spots. Also, freshwater fish make up 41% of all fishes and 20% of vertebrates that live in water bodies, Ganga has a bunch of different fishes because it has streams, rivers, dams, and an ocean nearby. There are about 179 types of freshwater fish spotted in Pakistan that belong to different groups - like 5 super orders, 10 orders, 26 families, and 82 genera. Some scientists say there are even more - around 193 freshwater fish species - in Pakistan. And one guy found 94 types just in Khyber Pakhtunkhwa province! Around 30 fish are fished commercially in Pakistan including *Tor macrolepis* and *Labeo rohita*. Sadly, factors like water pollution and building dams can mess up habitats for fishes so they can't move around properly. Some places have reported that about a fifth of all freshwater fish species are struggling or have gone extinct. The "Mahseer" group faces some big problems as well - especially *putitora* which is on the endangered list now. Mahseers usually hang out in Southeast Asian countries as well as areas near the Himalayas like Pakistan and India. Akeru River is home to seven nearly-threatened fish species like *Anguilla bengalensis* & *wallago attu* according to B. Saikumar & D.Ram kumar (2023). Loss of habitats due to changes we make harm freshwater fish diversity a lot. The Munneru River has about eighty types of fish from nine orders and twenty families with some being native, others exotic, or near-threatened according to Ayodhya et al. (2024). Fishes are considered as important because they are rich source of proteins, vitamins and minerals for human diet (Usman et al., 2017). Fishes are also vital for providing income and employment to millions of people across the world (Usman et al., 2017). There are about 30 fish species which are commercially exploited such as *Tor macrolepis*, *Cirrhinus mrigala*, *Cirrhinus reba*, *Labeo rohita*, *Gibelion catla*, *Clupisomanaziri*, *Channa straita*, *Channa marulius*, *Speratas arwari*, *Rita rita*, *Bagarius bagarius*, *Notopterus notopterus*, *Nemacheilus spp.*, *Tenualosa ilisha*, *Schizothorax spp.*, and *Wallago attu* (Usman et al., 2018). Ichthyodiversity is adversely affected by various factors like water pollution, over hunting, diversion of rivers and construction of dams which create hurdles in the migration of fishes from nestling zone to feeding zone. As regards the conservation status of the global freshwater fishes is concerned it has been assessed that 20% of freshwater fish species are mentioned either endangered or became extinct (Postle, 2002). Fish species distributed in Southeast Asian countries like Thailand, Malaysia, Vietnam, Cambodia, and Himalayan regions including trans-Himalayan countries like Pakistan, India, Myanmar and Nepal (Akhter et al.,)

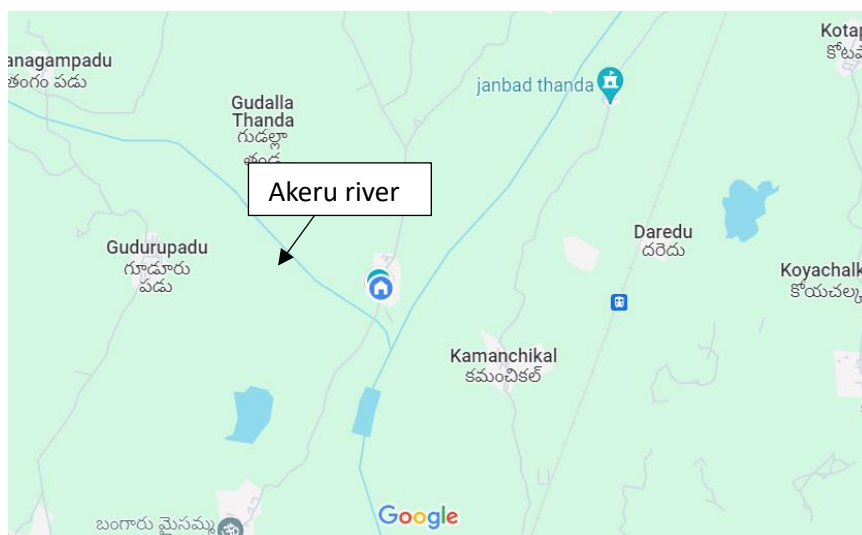


Fig: 1 Akeru River of Khammam District

Study area: - 17.325173, 80.130977

MATERIAL AND METHODS

Fish samples were collected from different areas of akeru river with the help of local fishermen, fish collectors, local fish market, with the help of Cast net and fishing gears.

Morphological Identification

- **Description:** Identifying fish based on physical characteristics such as body shape, fin structure, coloration, and scale pattern.
- **Tools:** Fish identification keys, field guides, and reference books.
- **Steps:**
 1. **Observation:** Examine external features like size, shape, and color.
 2. **Measurement:** Measure various body parts (e.g., total length, fork length, and fin lengths).
 3. **Comparison:** Compare observed features with identification keys.
- **Applications:** Widely used in field studies, biodiversity assessments, and fisheries management.



Fig 2: Systomus sarana



Fig 3: Cirrhinus fulungee

Meristic and Morphometric Analysis

- **Description:** Meristic analysis involves counting features such as fin rays and scales, while morphometric analysis involves measuring body parts.
- **Tools:** Rulers, calipers, and software for statistical analysis.
- **Steps:**
 1. **Count Meristic Traits:** Record counts of features like dorsal fin rays, gill rakers, and vertebrae.
 2. **Measure Morphometric Traits:** Take measurements of body parts such as head length, body depth, and fin lengths.
 3. **Analyze Data:** Use statistical methods to compare traits among species.
- **Applications:** Useful for distinguishing closely related species and subspecies.

Otolith Analysis

- **Description:** Otoliths, or ear stones, are calcium carbonate structures in the inner ear of fish, used for age and growth studies and species identification.

- **Tools:** Microscopes and image analysis software.
- **Steps:**
 1. **Extract Otoliths:** Carefully remove otoliths from the fish.
 2. **Examine Shape and Structure:** Analyze otolith shape, size, and growth rings.
 3. **Compare to Reference Collections:** Match observed otoliths with known species.

Fin and Scale Morphology

- **Description:** Examining the structure and pattern of fins and scales for identification.
- **Tools:** Microscopes, dissecting kits, and reference atlases.

- **Steps:**

1. **Collect Fins and Scales:** Carefully remove fins and scales for analysis.
2. **Examine Under Magnification:** Look for distinctive patterns, shapes, and structures.
3. **Compare with References:** Use atlases or guides to identify species.

List of fish species , order and families of akeru river

S.No	Scientific name	Common name	order	Family	IUCN Status
1	<i>Catla catla</i>	Katla	Cypriniformes	Cyprinidae	LC
2	<i>Labeo rohita</i>	Rohu	Cypriniformes	Cyprinidae	LC
3	<i>Cirrhinus mrigala</i>	Mrigal	Cypriniformes	Cyprinidae	LC
4	<i>Labeo calbasu</i>	Kalbasu	Cypriniformes	Cyprinidae	LC
5	<i>Amblypharyngodon mola</i>	Indian carplet	Cypriniformes	Cyprinidae	LC
6	<i>Amblypharyngodon microlepis</i>	Indian carplet	Cypriniformes	Cyprinidae	LC
7	<i>Cirrhinus cirrhosa</i>	White carp	Cypriniformes	Cyprinidae	LC
8	<i>Systomus sarana</i>	Olive barb	Cypriniformes	Cyprinidae	LC
9	<i>Cirrhinus fulungee</i>	Deccan white carp	Cypriniformes	Cyprinidae	LC
10	<i>Cirrhinus reba</i>	Reba carp	Cypriniformes	Cyprinidae	LC
11	<i>Ctenopharyngodon Idella</i>	Grass carp	Cypriniformes	Cyprinidae	I
12	<i>Cyprinus carpio</i>	Common carp	Cypriniformes	Cyprinidae	I
13	<i>Devario devario</i>	Sind danio	Cypriniformes	Cyprinidae	LC
14	<i>Garra lamta</i>	Stone sucker	Cypriniformes	Cyprinidae	LC
15	<i>Garra mullya</i>	Stone sucker	Cypriniformes	Cyprinidae	LC
16	<i>Labeo bata</i>	Bata	Cypriniformes	Cyprinidae	LC
17	<i>Osteobrama belangeri</i>	Manipur Osteobrama	Cypriniformes	Cyprinidae	NT
18	<i>Osteobrama cunma</i>	Cunma Osteobrama	Cypriniformes	Cyprinidae	NE
19	<i>Puntius chola</i>	Swamp barb	Cypriniformes	Cyprinidae	LC
20	<i>Puntius sophore</i>	Spot fin barb	Cypriniformes	Cyprinidae	LC
21	<i>Puntius ticto</i>	Fire-fin barb	Cypriniformes	Cyprinidae	LC
22	<i>Rasbora daniconius</i>	Slender barb	Cypriniformes	Cyprinidae	LC
23	<i>Salmophasia bacaila</i>	Large razor belly minnow	Cypriniformes	Cyprinidae	LC
24	<i>Salmophasia untrahi</i>	Mahanandi razor belly minnow	Cypriniformes	Cyprinidae	LC
25	<i>Mystus cavasius</i>	Gangetic mystus	Siluriformes	Bagridae	LC
26	<i>Mystus tengra</i>	Tengra cat fish	Siluriformes	Bagridae	LC
27	<i>Mystus vittatus</i>	Stripped dwarf catfish	Siluriformes	Bagridae	LC
28	<i>Clarias batrachus</i>	Air breathing catfish	Siluriformes	Clariidae	LC
29	<i>Pterygoplichthys pardalis</i>	Amazon sail fin catfish	Siluriformes	Loricariidae	I
30	<i>Ompok bimaculatus</i>	Butter cat fish	Siluriformes	Siluridae	NT
31	<i>Ompok pabda</i>	Pabda catfish	Siluriformes	Siluridae	NT
32	<i>Ompok pabo</i>	Pabo catfish	Siluriformes	Siluridae	NT
33	<i>Wallago attu</i>	Freshwater shark	Siluriformes	Siluridae	LC

34	<i>Macrognathus aral</i>	One stripe spiny eel	Synbranchiformes	Mastacembelidae	LC
35	<i>Macrognathus pacalus</i>	Barred spiny eel	Synbranchiformes	Mastacembelidae	LC
36	<i>Macrognathus armatus</i>	Zigzag spiny eel	Synbranchiformes	Mastacembelidae	LC
37	<i>Chanda nama</i>	Indian glassy fish	Perciformes	Ambassidae	LC
38	<i>Parambassis ranga</i>	Indian glassy fish	Perciformes	Ambassidae	LC
39	<i>Anabas testudineus</i>	Climbing perch	Anabantiformes	Anabantidae	DD
40	<i>Channa gachua</i>	Dwarf snakehead	Perciformes	Channidae	LC
41	<i>Channa marulius</i>	Giant snakehead	Perciformes	Channidae	LC
42	<i>Channa punctata</i>	Spotted snakehead	Perciformes	Channidae	LC
43	<i>Channa striata</i>	Striped snakehead	Perciformes	Channidae	LC
44	<i>Etroplus maculatus</i>	Orange chromide	Perciformes	Cichlidae	LC
45	<i>Etroplus suratensis</i>	Green chromide	Perciformes	Cichlidae	LC
46	<i>Oreochromius mossambicus</i>	Mosombique tilapia	Perciformes	Cichlidae	I
47	<i>Oreochromius niloticus</i>	Nile tilapia	Perciformes	Cichlidae	I
48	<i>Glossogobius giuris</i>	Bar-eyed goby	Gobiiformes	Gobiidae	LC
49	<i>Anguilla bengalensis</i>	Long finned eel	Anguilliformes	Anguillidae	NT
50	<i>Xenentodon cancilla</i>	Freshwater gar fish	Beloniformes	Belonidae	LC
51	<i>Notopterus notopterus</i>	Bronze feather back S	Osteoglossiformes	Notopteridae	LC

*NT-Near threatened, *NE-Not Evaluated, *DD-Data Deficient, *LC-Least concern, *I-Introduced, *VU-Vulnerable.

RESULT & DISCUSSION:

The present study results were revealed that the occurrence of 51 fish species belonging to 07 orders and 14 families list of fishes including their order family, genus, species, common name & IUCN status of the above species are mentioned as per as. Due to seasonal variations' some fishes migrate from akeru to Kirshna River through munneru river.



Discussion:

Regarding the data of the ichthyofaunal diversity in the akeru river the most dominant fishes are the major carps and minor carps are largely found during the study period of this ichthyofaunal diversity.

Dr.Ayodhya Reddy, et all (2024) A study on ichthyofaunal diversity of munneru river , concluded that munneru river has species richness having 80 fishes following by 09 orders and 20 families.

G.Paramesh, et al (2023) reported the ichthyofaunal diversity of Ranganayaka , in this study the authors identified 41 fish species following following 8 orders and 15 families , among these cypriniformes are dominant 14 species belonging to this cyprinidae family.

Kante Krishna prasad, chelmala srinivasulu (2021) a checklist of fishes of Telangana state , india they had concluded 143 species of freshwater following 14 order and 34 families are recored in Telangana state in this study while 39 are endemic to india

T.Jagadeeshwara Chari, Prof. A.V.Rajashekar (2020) reported the species abundance in the Singaraya reservoir and the occurrence of 33 species belonging to 6 orders,the cypriniformes 15 species ,siluriformes 8 species , osteoglossiformes 2 species , channiformes 3 species, perciformes 4 species , anthriformes 1 species were identified . order wise percentage wise composition

Conclusion:

We here by conclude that the akeru river has 51 different fish species , the present study will help to the fisheries department and fisheries students to know about the distribution of the fishes at akeru river and easy to implement fishery mesh size regulations and conservation strategies at different seasons to overcome from the loss of some rare fishes and easy to study the relation between different fishes and migration of fishes ,The diversity of fish is more in akeru river and dominant by order cypriniformes having 24 fishes and second dominant by perciformes 12 and least distributions is occupied by Anguilliformes, Beloniformes, Osteoglossiformes each having a single numbered distributions’.

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