



# A Study Of Ichthyofaunal Diversity Of The Matsyagedda Stream, Eastern Ghats, India: A Historical Baseline From 1996 Data

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**Abstract:** This study presents historic ichthyofaunal data collected between July 1993 and June 1996 from the Matsyagedda stream, a hill stream located in the Eastern Ghats near Pedabayalu mandal, Visakhapatnam district (present its called as Alluri Sitharama Raju district), Andhra Pradesh, India. The data, gathered using traditional fishing methods, remained unpublished until now. A total of 31 fish species belonging to 17 genera, 10 families, and 8 orders were recorded. The order Cypriniformes showed the highest species richness (45.2%), followed by Siluriformes (22.6%). The presence of both predatory and weed fishes reflects a balanced aquatic ecosystem. IUCN status evaluation revealed that 80.65% of the species were of Least Concern, while 9.68% each were Near Threatened and Not Evaluated. This historic dataset provides a valuable baseline for assessing long-term ecological changes, offering critical insights for future conservation planning and biodiversity monitoring in the Eastern Ghats region.

**Index Terms - Ichthyofaunal Diversity, IUCN, Matsyagedda Stream, Pedabayalu mandal.**

## 1. INTRODUCTION

India is one of the richest countries in terms of freshwater fish diversity, owing to its vast network of rivers, streams, wetlands, and diverse ecological zones. Freshwaters support over 10% of all known species, including approximately one-third of vertebrates and one-half of fishes, while only covering less than 1% of the surface of the Earth (Sayer et al., 2025; Nimma et al., 2025; Zieritz et al., 2024). Ichthyofaunal diversity plays a crucial role in maintaining freshwater ecosystem health, supporting local livelihoods, and contributing to ecological balance. Documenting and monitoring fish diversity in freshwater systems is essential for understanding species distribution, assessing ecosystem changes, and guiding conservation efforts (Ray et al., 2022). Lack of knowledge about fish fauna is a major barrier to the popularization of lesser-known fish species in each environment (Sanapala et al., 2022).

Hill streams, in particular, represent unique and sensitive freshwater habitats with a distinct assemblage of fish species adapted to fast-flowing, oxygen-rich waters. These habitats are often under-documented and vulnerable to anthropogenic pressures such as pollution, habitat modification, and overexploitation.

The present study is based on ichthyofaunal data collected between July 1993 and June 1996 from the Matsyagedda stream, a hill stream located in the Alluri Sitharama Raju district of Andhra Pradesh, India. The data was collected but remained unpublished until now. Since there is no information on the stream fishes of Matsyagedda, this paper aims to formally document the ichthyofaunal diversity observed during that period, serving as a valuable historical baseline for future comparative studies and conservation assessments.

## 2. MATERIALS AND METHODS

### 2.1 Study area

Matsyagedda stream is located in Pedabayalu village of Visakhapatnam district, Andhra Pradesh, India. The stream is shallow, rainfed, and springfed originating in the hills of Eastern Ghats, situated between  $18^{\circ}16'$  and  $18^{\circ}18'$  N latitudes and  $18^{\circ}37'$  and  $18^{\circ}40'$  E longitudes in the vicinity of Pedabayalu village (Fig. 1). It is one of the major water source for the Jolaput reservoir, which was constructed across the river Manchkund at Jolaput village, nearly 200 km from Visakhapatnam. It often experienced flash floods due to their elevated terrain and rapid runoff. The region is influenced by both the South-West and North-East monsoons, with the South-West monsoon contributing the majority of annual rainfall, while the North-East monsoon brings comparatively less precipitation. During the study period, the mean monthly rainfall ranged from 87.33 mm to 127.41 mm, reflecting moderate to high precipitation levels. The atmospheric temperature during sampling was recorded at approximately  $30^{\circ}\text{C}$ , while the water temperature varied between  $28^{\circ}\text{C}$  and  $29^{\circ}\text{C}$ .

### 2.2 Sampling and Collection of Fishes

The study was conducted from July 1993 to June 1995 from different stations in the stream Matsyagedda was made with the help of a cast net, a drag net, a dip net, a gill net, a hook net, and a line. Immediately after collection, the colour and other distinct marks like spots and blotches were noted, and the fishes were preserved in 10% formalin solution. The identification was done with the help of a standard text (Day 1875; Srivastava 1988; Talwar 1991 and Jayaram 1994).

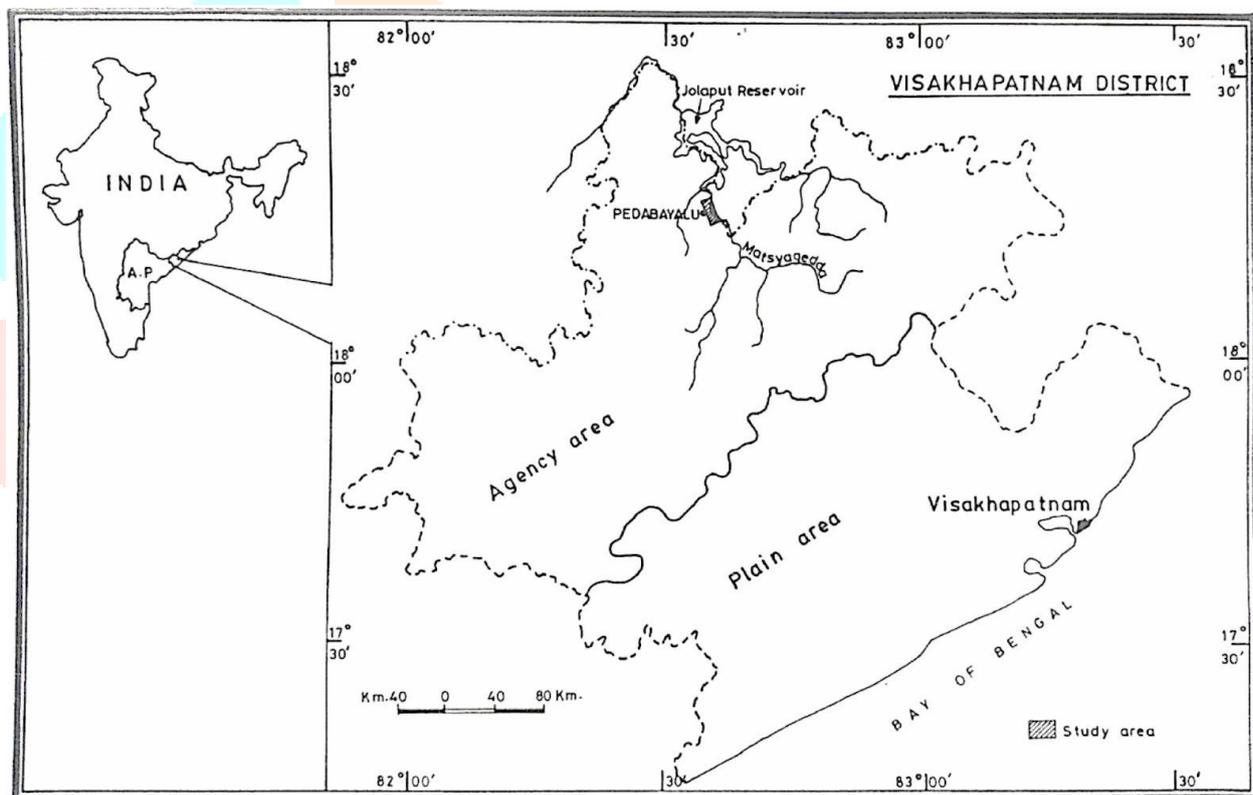


Figure 1: The map of Maatsyagedda stream, Visakhapatnam District, Andhra Pradesh, India



Figure 2: The view of Matsyagedda stream

### 3. RESULTS AND DISCUSSION

The fish fauna is an important aspect of the fishery potential of a water body. In this present study, the fish fauna of the Matsyagedda stream has been collected and identified. The stream has a rich potential for a variety of food fishes, and they are *Anguilla bengalensis bengalensis*, *Anabas testudineus*, *Catla catla*, *Cirrhinus mrigala mrigala*, *Cirrhinus reba*, *Cyprinus carpio*, *Labeo nukta*, *Labeo rohita*, *Puntius chola*, *Puntius sarana sarana*, *Puntius sophore*, *Puntius ticto*, *Puntius titius*, *Salmostoma bacaila*, *Salmostoma clupeoides*, *Amblypharyngodon mola*, *Channa orientalis*, *Channa punctatus*, *Channa striatus*, *Glossogobius giuris*, *Notopterus notopterus*, *Mystus cavasis*, *Mystus keletius*, *Mystus montanus*, *Mystus tengara*, *Mystus vittatus*, *Clarias batrachus*, *Heteropneustes fossilis*, *Macrognathus aral*, *Macrognathus pancalus*, and *Mastacembelus alboguttatus*.

A total of eight fish orders were recorded in the present study, comprising 10 families, 17 genera, and 31 species. Among these, the order Cypriniformes exhibited the highest diversity, encompassing 2 families, 7 genera, and 14 species, which accounts for 45.2% of the total species recorded. The order Siluriformes followed with 2 families, 3 genera, and 7 species, contributing 22.6%. Moderate diversity was observed in Channiformes and Synbranchiformes, each representing 3 species and contributing 9.7% respectively. In contrast, the orders Anguiliformes, Anabantiformes, Gobiiformes, and Osteoglossiformes were each represented by a single family, genus, and species, contributing 3.2% individually to the total species count (Figure 3 and 36). Of the thirty-one species, the predatory fishes from the stream include *Channa orientalis*, *C. punctatus*, *C. striatus*, *Clarias batrachus*, *Glossogobius giuris*, *Heteropneustes fossilis*, *Mystus cavasius*, *M. keletius*, *M. montanus*, *M. tengara*, and *M. vittatus*. The weed fishes which grow to a small size include *Puntius sarana*, *P. sophore*, *P. ticto*, *Salmostoma bacaila*, *S. clupeoides*, and *Amblypharyngodon mola*.

Table 1: List of collected and identified fish species in the Matsyagadda stream

Sl. No.	Order	Family	Species name	Telugu name	English name	Conservation Status (IUCN, 2024)
1	Anguiliformes	Anguillidae	<i>Anguilla bengalensis bengalensis</i>	Malumgulu, Malugu	Indian longfin eel	NT
2	Anabantiformes	Anabantidae	<i>Anabas testudineus</i>	Gorasa	Climbing perch	LC
3	Cypriniformes	Cyprinidae	<i>Catla catla</i>	Bocha	Catla	LC
4			<i>Cirrhinus mrigala mrigala</i>	Ballalamosa	Mrigal	LC
5			<i>Cirrhinus reba</i>	Rewa	Reba carp	LC
6			<i>Cyprinus carpio</i>	Bangaru teega	Common carp	LC
7			<i>Labeo nukta</i>	Nukta Macha	Orange-fin Labeo	NE
8			<i>Labeo rohita</i>	Bocha, Gandumenu	Rohu	LC
9			<i>Puntius chola</i>	Parigi	Swamp barb	LC
10			<i>Puntius sarana sarana</i>	Paraga	Olive barb	LC
11			<i>Puntius sophore</i>	Budda Pakke	Spotfin swamp barb	NT
12			<i>Puntius ticto</i>	Chenaputhi	Two spot barb	LC
13			<i>Puntius titius</i>	Parigi	Twospot barb	NT
14		Danionidae	<i>Salmostoma bacaila</i>	Badisa	Large razorbelly minnow	LC
15			<i>Salmostoma clupeoides</i>	Badisa	Bloch razorbelly minnow	LC
16			<i>Amblypharyngodon mola</i>	Tella maya	Mola carplet	LC
17	Channiformes	Channidae	<i>Channa orientalis</i>	Erramatta, Mattagudisa	Asiatic snakehead	NE
18			<i>Channa punctatus</i>	Burdamatta	Spotted snakehead	LC
19			<i>Channa striatus</i>	Korramenu	Stripped snakehead	LC
20	Gobiiformes	Gobiidae	<i>Glossogobius giuris</i>	Bulla kokku	Tank goby	LC
21	Osteoglossiformes	Notopteridae	<i>Notopterus notopterus</i>	Mangalikatti, Ulakatta	Grey featherback	LC
22	Siluriformes	Bagridae	<i>Mystus cavasis</i>	Jella	Striped dwarf catfish	LC
23			<i>Mystus keletius</i>	Jella	Keletius mystus	LC
24			<i>Mystus montanus</i>	Jella	Wynnad mystus	LC

25			<i>Mystus tengara</i>	Jella	Tengra catfish	LC
26			<i>Mystus vittatus</i>	Erra jella	Stripped dwarf catfish	LC
27			<i>Clarias batrachus</i>	Marpu	Magur	LC
28		Heteropneustida	<i>Heteropneustes fossilis</i>	Singhi, Mapujena	Stinging catfish	LC
29	Synbranchiformes	Matacembelidae	<i>Macrognathus aral</i>	Bommiday	One-stripe spiny eel	LC
30			<i>Macrognathus pancalus</i>	Bommidai	Stripped spiny eel	LC
31			<i>Mastacembelus alboguttatus</i>	Haavu-meenu	Sittang spinyeel	NE

EN-Endangered; VU-Vulnerable; LC-Least concern; DD-Data deficient; NE-Not evaluated, NT: Near threatened.

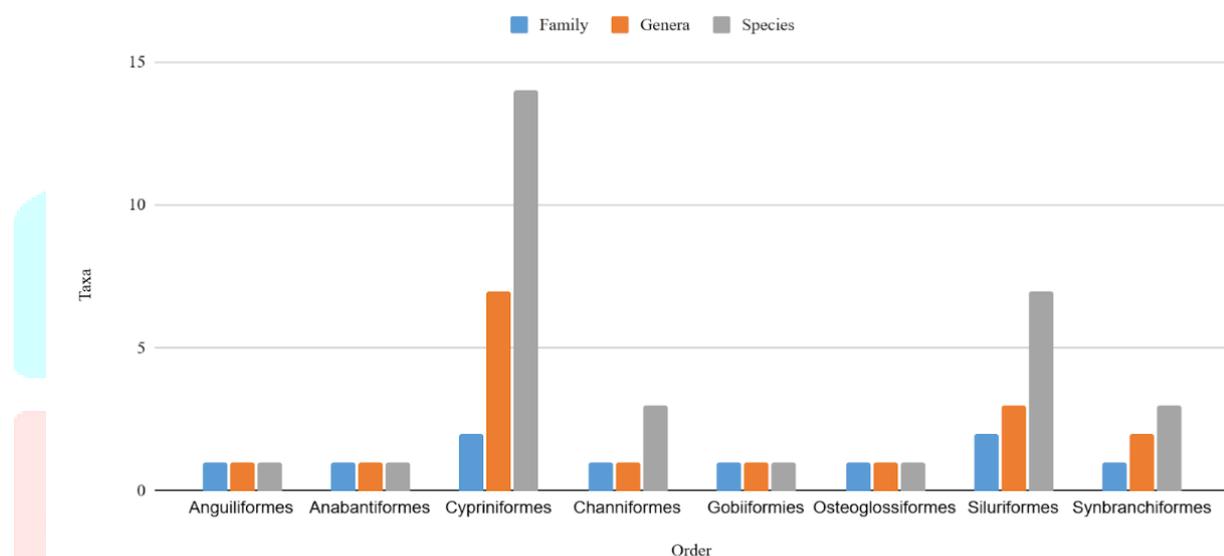


Figure 3: Graphical representation of the number of taxa reported in the Maatsyagedda stream

Several studies have been reported on fish diversity in different waterbodies across India and other countries; a total of 32 species of finfishes belonging to 26 genera, 14 families and 6 orders were recorded in Upper Mullamari Reservoir, Basavakalyan, Karnataka (India). Among them Cypriniformes represented 17 species followed by Siluriformes (9), Perciformes (3) and order Symbbranchiformes, Osteoglossiformes and Clupiformes contributed one species each (Kumar 2021); a total of 63 species of freshwater, estuary, and marine fishes belonging to 13 orders and 37 families were identified in the Sasihithlu Estuary of Dakshina Kannada, Karnataka, India (Bharadwaj R & A.G, 2021); a total of 12 fish species belonging to 6 orders and 7 families were recorded during the present study in Beas River Near Nadaun Region of Himachal Pradesh, India (Banyal and Sharma 2023); a study reported that the presence of 49 fish species from 12 orders, 19 families, and 33 genera from February 2021 to January 2023 at Gotta Barrage's four landing points (Rao 2023); a total of 102 fish species belonging to 2 classes, 22 orders, 53 families, and 72 genera were recorded in Sikka Coast, Gulf of Kachchh, Gujarat (Parmer et al., 2023); a survey revealed the occurrence of great range of diversity of fishes representing 106 species distributed under 10 orders and 31 families in Tipkai River in Assam, India (Ahmed et al., 2023); 95 fish specimens were collected, 13 fish species belonging to 1 class, 4 orders, 4 families, 9 genera were recorded from the river Asan in the Garhwal Himalaya, India (Chaudhary et al., 2024); a total of 47 finfish species belonging to 11 orders, 19 families and 34 genera were recorded from Gosthani River (Rao et al., 2024); a total of 47 species of fishes belonging to 12 orders 19 families 35 genera were identified in Lakshmipuram Lake Andhra Pradesh, India (Pratap et al., 2025).



Figure 5: *Notopterus notopterus*



Figure 6: *Anguilla bengalensis bengalensis*

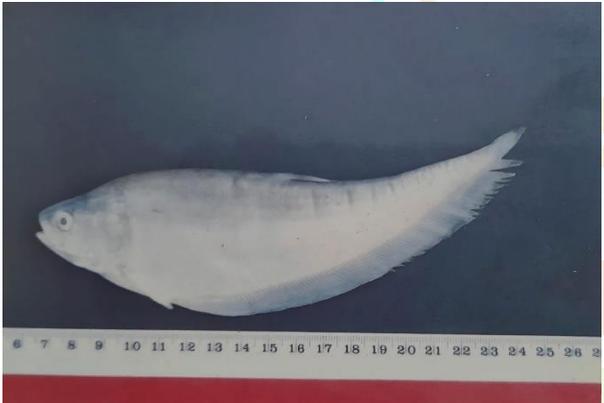


Figure 7: *Catla catla*



Figure 8: *Cirrhinus mrigala mrigala*



Figure 9: *Cyprinus carpio*



Figure 10: *Cirrhinus reba*

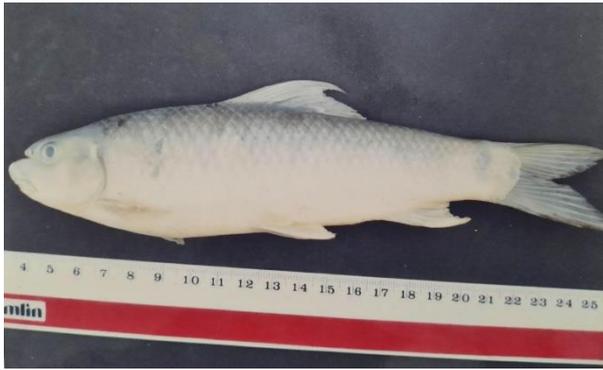


Figure 11: *Labeo nukta*



Figure 12: *Labeo rohita*

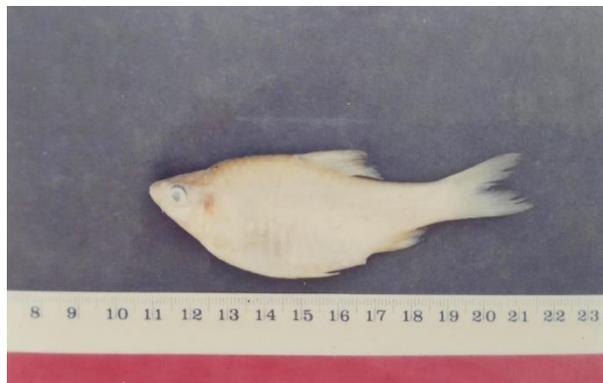


Figure 13: *Puntius chola*



Figure 14: *Puntius sarana sarana*



Figure 15: *Puntius sophore*

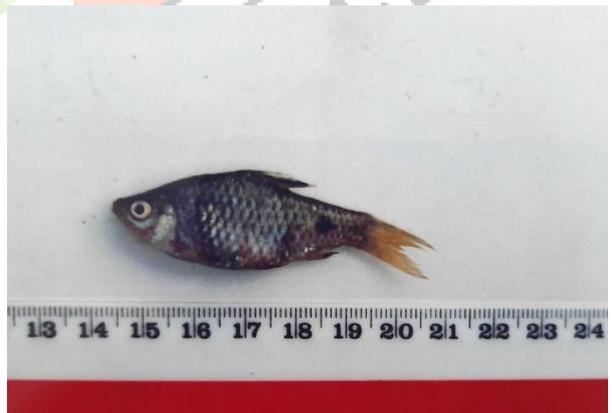


Figure 16: *Puntius ticto*



Figure 17: *Puntius titius*



Figure 18: *Salmostoma bacaila*



Figure 19: *Salmostoma clupeioides*



Figure 20: *Amblypharyngodon mola*



Figure 21: *Mystus cavasis*



Figure 22: *Mystus keletius*



Figure 23: *Mystus montanus*



Figure 24: *Mystus tengara*



Figure 25: *Mystus vittatus*



Figure 26: *Clarias batrachus*



Figure 27: *Heteropneustes fossilis*



Figure 28: *Glossogobius giuris*



Figure 29: *Anabas testudineus*



Figure 30: *Channa orientalis*



Figure 31: *Channa punctatus*



Figure 32: *Channa striatus*



Figure 33: *Macrognathus aral*



Figure 34: *Macrognathus pancalus*



Figure 35: *Mastacembelus alboguttatus*

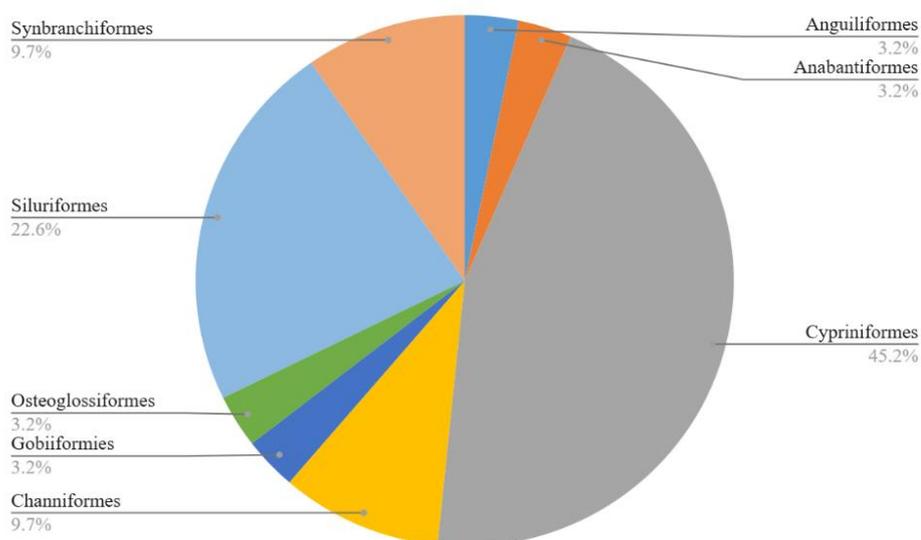


Figure 36: Pie chart showing the percentage of species contribution in different orders

An attempt has been made to bring out the classification of fishes on the basis of economic importance by the proforma given by Lagler(1956), adopted by Ramana and Sreeramulu (1994) (Table 3).

It was discovered that nine species were prolific breeders. They are commercially significant, have a high market value, and can be cultivated. Some 14 species of fish have been identified as fine food fish due to their high protein content and flavor. Eight species have been classified as coarse food, even though they are not very important as food, they form a significant amount of protein. *Puntius* species like as *Amblypharyngodon mola*, *P. titius*, *P. ticto*, *P. chola*, and *P. sophore* can be kept in aquariums for their aesthetic and recreational value because of their small size. Some species, such as *P. ticto*, *S. bacaila*, and *S. clupeioides*, are categorized as forage fishes because they provide food for larger fish.

Fishes like *N. notopterus*, *P. chola*, *P. sarana*, *P. sophore*, *P. ticto*, *P. titius*, *C. catla*, *A. mola*, *M. cavasius*, *M. montamus*, *M. tengara*, *M. vittatus*, *H. fossilis*, *C. orientalis*, and *C. punctatus* are known to be effective in controlling mosquito population by feeding mosquito larvae and are useful in controlling some diseases; therefore useful in public health. Some species like *N. notopterus*, *H. fossilis*, and *C. punctatus* have been found to be of medicinal value.

Based on the IUCN Red List assessment, the conservation status of the recorded fish species reveals that a majority, 25 species (80.65%), are categorized as Least Concern, indicating a relatively stable population in the study area. Three species (9.68%) fall under the Not Evaluated category, and another three species (9.68%) are classified as Near Threatened, suggesting the need for monitoring due to potential risks. Notably, no species were recorded under the Data Deficient category. The dominance of Least Concern species suggests a healthy fish diversity, though the presence of Near Threatened species highlights the importance of continued conservation efforts and habitat protection.

Table 2: Taxa composition as per IUCN status

IUCN Status	Least Concern	Data deficient	Not Evaluated	Near Threatened
No. of Species	25	0	3	3
Percentage of Species %	80.64516129	0	9.677419355	9.677419355

#### 4. CONCLUSION

The present study provides the first systematic documentation of fish diversity from the Matsyagedda stream using historical data collected between 1993 and 1996. A total of 31 species were identified, with Cypriniformes and Siluriformes representing the most diverse orders. The dominance of species categorized as Least Concern under the IUCN Red List suggests a relatively healthy fish community during the study period. The presence of both predatory and weed fishes indicates a varied trophic structure in the stream ecosystem. This research serves as a valuable historical baseline for monitoring ecological changes, evaluating anthropogenic impacts, and guiding conservation strategies in the Eastern Ghats region of Andhra Pradesh.

Table 3: Economic classification of fishes

Sl. No.	Name of the Fish	Commercial	Fine food	Coarse food	Aquarium	Forage	Others
1	<i>Anguilla bengalensis bengalensis</i>						
2	<i>Anabas testudineus</i>	-	*	-	-	-	-
3	<i>Catla catla</i>	*	*	-	-	-	-
4	<i>Cirrhinus mrigala mrigala</i>	*	*	-	-	-	-
5	<i>Cirrhinus reba</i>	*	*	-	-	-	-
6	<i>Cyprinus carpio</i>	*	*	-	-	-	-
7	<i>Labeo nukta</i>	*	-	-	-	-	-
8	<i>Labeo rohita</i>	*	*	-	-	-	-
9	<i>Puntius chola</i>	-	-	*	*	-	B
10	<i>Puntius sarana sarana</i>	*	*	-	-	-	-
11	<i>Puntius sophore</i>	-	-	-	*	-	B
12	<i>Puntius ticto</i>	-	-	-	*	-	B
13	<i>Puntius titius</i>	-	-	-	*	*	-
14	<i>Salmostoma bacaila</i>	-	*	-	-	*	-
15	<i>Salmostoma clupeoides</i>	-	-	-	-	*	-
16	<i>Amblypharyngodon mola</i>	-	-	-	-	-	L.V.
17	<i>Channa orientalis</i>	-	-	*	-	-	-
18	<i>Channa punctatus</i>	*	-	-	-	-	L.V.
19	<i>Channa striatus</i>	*	*	-	-	-	L.V.
20	<i>Glossogobius giuris</i>	-	-	*	-	-	-
21	<i>Notopterus notopterus</i>	-	-	*	-	-	M.V.
22	<i>Mystus cavasis</i>	-	*	-	-	-	-
23	<i>Mystus keletius</i>	-	-	*	-	-	-
24	<i>Mystus montanus</i>	-	-	*	-	-	-
25	<i>Mystus tengara</i>	-	-	*	-	-	-
26	<i>Mystus vittatus</i>	-	-	*	-	-	-
27	<i>Clarias batrachus</i>	*	*	-	-	-	B.P. & S.V.
28	<i>Heteropneustes fossilis</i>	*	*	-	-	-	M.V.
29	<i>Macrognathus aral</i>	-	*	-	-	-	-
30	<i>Macrognathus pancalus</i>	-	*	-	-	-	-
31	<i>Mastacembelus alboguttatus</i>	-	*	-	-	-	-

‘\*’ = In use    ‘-’ = Not in use

Commercial : Prolific breeders can be cultured, have high market value

Fine food : Having high protein value and good taste

Coarse food : Taken as food by the poor people

Aquarium : Can be maintained for aesthetic and recreational value

Forage : Food for predatory fishes

Others : Having some extra qualities such as

M.V. = Medicinal value; B= as a bait

S. V. = Scientific value; B.P. = By-product; L.V. Larvivorous

## 5. ACKNOWLEDGMENT

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