Journal of Aquatic Biology & Fisheries | 2024 | 12(1) | pp. 1-11
ISSN 2321–340X
OPEN ACCESS
http://www.jabf.in/
University of Kerala, INDIA

Fish diversity of Priyadarshini Jurala Project in erstwhile Mahabubnagar district, Telangana, India

Laxmappa Boini [1*] and Ravinder Rao Bakshi [2]

[1]*Department of Fisheries, Wanaparthy- 509103, Telangana, India*
[2] *Department of Zoology, Dr BRR Govt. Degree College, Jadcherla- 509301, Telangana, India*
**E.mail: laxmappaboini@gmail.com*

ABSTRACT

Fish diversity is a good indicator of the health of the aquatic ecosystem and represents a balanced ecosystem. Preliminary documentation of fish diversity of Priyadarshini Jurala Project in the erstwhile Mahabubnagar district of Telangana, India, was conducted from April 2021 to March 2022. For the study, eight sampling stations were selected from the dam, located in the vicinity of the Project. From each station, collected fish were identified with the help of standard keys. The fish samples were collected monthly with the help of local fishermen by using fishing craft and gear. The investigation revealed 88 fish species belong to 11 orders, 19 families and 48 genera in the Jurala Project. Order Cypriniformes was the most dominant group represented by 47 species followed by Siluriformes, Cicliformes, Beloniformes, Synbranchiformes, Anabantiformes, Perciformes, Osteoglossiformes, Gobiiformes, Mugiliformes and Anguilliformes. Among the families recorded, Cyprinidae was the most dominant followed by the Bagridae. The study revealed that this habitat is mostly stressed in nature due to anthropogenic activities and over exploitation of fishes throughout the year.

ARTICLE HISTORY

Received on: 29-01-2024
Revised on: 27-04-2024
Accepted on: 01-05-2024

KEYWORDS

Jurala Project, Telangana, Fish diversity, Craft and Gear

1. Introduction

In India, irrigation has always been the largest user of water. Irrigation projects mainly consist of engineering (or hydraulic) structures which collect, conveys, and delivers water to areas where crops are grown. The irrigation projects form the basis of domestic, agricultural, and industrial water supply, hydroelectricity, water transport, and fishing. The entire array of life in water is affected due to pollution in water. The problem of water quality deterioration is mainly due to human activities such as disposal of dead bodies, discharge of industrial and sewage wastes and agricultural runoff and pose serious health hazards (Meitei *et al.* 2004). Studies have been made on fish diversity of various freshwater bodies in India during the last few decades. The fish diversity of a water body has a crucial role in the food web and affects directly and indirectly in the stability of a particular ecosystem (Polis and Strong 1996).

The aquatic ecosystem is important and has a large number of economically valuable fish and for food source. Fishes are important vertebrates in Animal world, contributing to the biodiversity of animals. Fish is primarily used as a food source. Several studies were carried out related to fish diversity and water quality in rivers of India. Many workers have reported on the fish diversity of different reservoirs of Telangana State. Recently some studies have been made on the ichthyofaunal diversity of the reservoirs of the erstwhile Mahabubnagar district (Laxmappa *et al* 2014; Sreenivas Reddy & Satya Parameswar, 2015). Aquatic organisms are more prone to human activities and can reflect ecosystems' health. The fish diversity study can be an effective tool for monitoring ecosystem health. In recent years, sand mining, construction activities, local tourism activities, overfishing were increased tremendously to cause several environmental issues in the country. The literature survey found that the fish diversity of Jurala Project was not yet completely assessed. In this context, a study on fish diversity of the Jurala Project was conducted and checklist was prepared.

2. Materials and Methods

2.1 Study Area

Priyadarshini Jurala Project (PJP) is one of the important projects in Telangana, about 60 km from the district headquarters and 160 km from the state capital, Hyderabad. Jurala Project is a large size irrigation project located near Revulapally village of Dharoor Mandal (Tehsil) in Mahabubnagar district, Telangana state. The main purpose of the construction of this reservoir was for irrigation, power generation and drinking water in the district. Now, the Jurala Project has also become source of livelihood to more than 800 families residing in and around the vicinity of the project.

Jurala was the first major project in the district and was constructed in 1996. It is an alluring project and was constructed in a picturesque location across the Krishna River in the erstwhile Mahabubnagar district (Fig. 1). The catchment area of the project is 1, 29,499 Sq. Km. Total water spread area of the project at FRL is 6770 ha. The salient features of the Jurala Project are furnished in Table 1.

2.2 Sampling stations

A detailed field survey was carried out for the sampling. The fish samples were collected from 8 different stations of the Jurala Project, from April 2021 to March 2022. The sampling stations are Revulapally (S1), Uppair (S2), Garlapad (S3), Mustipally (S4), Muslaipally (S5), Peddakadmur (S6), Ellampally (S7), and Nandimalla (S8). The location map of the study area and sampling stations are given in Fig. 1.

2.3 Methodology

The fish samples were collected from selected sample stations of Jurala Project mainly by fishermen, fish collectors, local fish markets, and fish sellers. The fishes were collected with the help of local fishermen using fish traps, cast nets and gill nets. The morphometric characters of species identification were carried out using standard keys (Talwar and Jhingran, 1991; Jayaram, 2012). The collected fishes were immediately taken photographs in fresh condition, preserved in 10% formalin without any post-mortem stages, and recorded vernacular names. Classification was carried out on lines of Jayaram (2012), and Nelson *et al*. (2016). All identified specimens were preserved in formalin and deposited at the Department of Zoology, Dr. BRR Govt. Degree College, Jadcherla of Mahabubnagar district in Telangana state. Assuming that fishing efforts were common for given type of fishing net, the relative abundance of the fish was classified in to four categories, namely: abundant (76-100% of the total catch), common (51- 75% of the total catch), moderate (26-50% of the total catch) and rare (1-25% of the total catch).

Table 1. Salient features of the Jurala Project in the erstwhile Mahabubnagar district

Attribute	Value
Name of Dam	Priyadarshini Jurala Project
River Name	Krishna
Basin	Krishna
Type of Dam	Earthen + Masonry
Purpose of Dam	Multi-Purpose
Year of Completion	1996
Catchment Area	1,29,499 Sq. Km
Length of Dam (m)	4534
Maximum Height above foundation	40 mt
Minimum Draw Down Level (MDDL)	314.86 mi
Gross Storage Capacity at FRL	11.941 TMC
Dead Storage Capacity (below MDDL)	5.143 TMC
Type of Spillway	Ogee
Length of Spillway	927 mt
Number of Spillway Gates	62

Source: Irrigation Dept.

3. Results and Discussion

The present investigation results revealed that the occurrence of 88 fish species belong to 11 orders, 19 families and 48 genera. List of these fishes including their order, family, genus, species, and IUCN status is given in Table 3. Based on percentage composition and species richness, order Cypriniformes was dominant (47 species) followed by Siluriformes (23 species), Cicliformes (4 species), Beloniformes (3 species), Synbranchiformes (3 species), Anabontiformes (2 species), Perciformes (2 species), Anguilliformes (1 species each), Gobiiformes (1 species), Mugiliformes (1 species), and Osteoglossiformes (1 species). The number and percent composition of species under 11 orders were represented in Table 3 and Fig. 3.

The fish diversity of Jurala Project comprises 19 families namely, Anguillidae, Hemiramphidae, Belonidae, Cyprinidae, Notopteridae, Ambassidae, Danionidae, Channidae, Cichlidae, Gobiidae, Mugilidae, Bagridae, Clariidae, Heteropneustidae, Pangasidae, Schilbedae, Siluridae, Sisoridae and Mastacembelidae. The number and percent composition of species under 19 families are represented in Table 4 and Fig. 4.

The species composition of different families recorded that 39 species belong to family Cyprinidae that made up to 44.32%, 10 species to the family Bagridae which contributed to 11.36%, 8 species to Danionidae which contributed to 9.09%, 5 species to Schilbeidae that contributed to 5.68%, 4 species to family Cichlidae that contributed to 4.55%, 3 species each to families Mastacembelidae, and Siluridae contributed to 3.41%, 2 species each to families Ambassidae, Channidae, Claridae, and Hemiramphidae contributed to 2.27%. 1 species to families Anguillidae, Belonidae, Gobiidae, Heteropneustidae, Mugilidae, Notopteridae, Pangasidae, and Sisoridae contributed 1.14% each of total fish species.

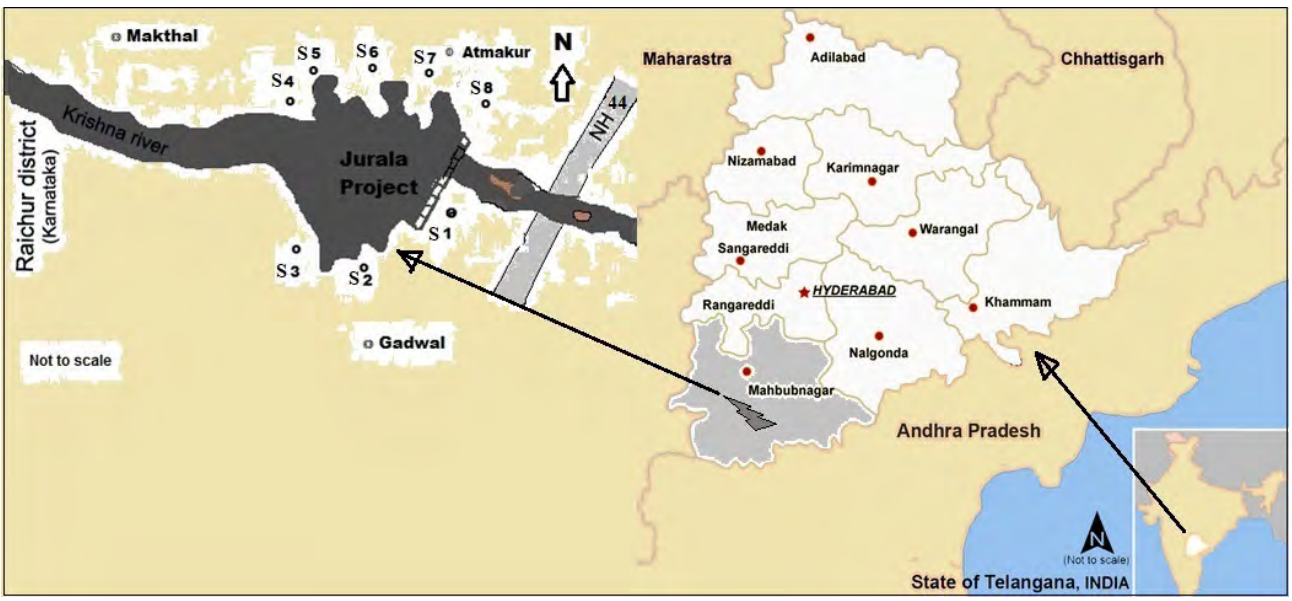


Fig. 1. Location map of Jurala Project with sampling stations

Table 2. List of fishes and their order, family, species, population status and IUCN status at Jurala Project

Sl. No.	Order & Species	Family	Population Status	IUCN Status
I	**Order ANABONTIFORMES**			
1	*Channa marulius* (Hamilton, 1822)	Channidae	M	LC
2	*Channa striata* (Bloch, 1793)	Channidae	M	LC
II	**Order ANGUILLIFORMES**			
3	*Anguilla bengalensis* (Gray, 1831)	Anguillidae	R	NT
III	**Order BELONIFORMES**			
4	*Hyporhamphus limbatus* (Valenciennes, 1847)	Hemiramphidae	C	LC
5	*Rhynchorhamphus georgii* (Valenciennes, 1847)	Hemiramphidae	M	LC
6	*Xenentodon cancila* (Hamilton, 1822)	Belonidae	C	LC
IV	**Order CICHLIFORMES**			
7	*Etroplus suratensis* (Bloch, 1790)	Cichlidae	C	LC
8	*Oreochromis mossambicus* (Peters 1852) *	Cichlidae	M	VU
9	*Oreochromis niloticus* (Linnaeus, 1758) *	Cichlidae	A	LC
10	*Pseudetroplus maculatus* (Bloch, 1795)	Cichlidae	R	LC
V	**Order CYPRINIFORMES**			
11	*Cirrhinus cirrhosus* (Bloch, 1795)	Cyprinidae	R	VU
12	*Cirrhinus fulungee* (Sykes, 1839)	Cyprinidae	M	LC
13	*Cirrhinus mrigala* (Hamilton, 1822)	Cyprinidae	M	LC
14	*Cirrhinus reba* (Hamilton, 1822)	Cyprinidae	C	LC
15	*Crossocheilus latius* (Hamilton, 1822)	Cyprinidae	C	LC
16	*Ctenopharyngodon idella* (Valenciennes, 1842) *	Cyprinidae	R	LC
17	*Cyprinus carpio* (Linnaeus, 1758) *	Cyprinidae	R	VU
18	*Garra lamta* (Hamilton, 1822)	Cyprinidae	M	LC
19	*Garra mullya* (Sykes, 1839)	Cyprinidae	C	LC
20	*Gibelion catla* (Hamilton, 1822)	Cyprinidae	A	LC
21	*Hypselobarbus curmuca* (Hamilton, 1822)	Cyprinidae	R	EN
22	*Hypselobarbus dobsoni* (Day, 1869)	Cyprinidae	M	DD
23	*Hypselobarbus jerdoni* (Jerdon, 1849)	Cyprinidae	M	LC
24	*Hypselobarbus kolus* (Sykes, 1839)	Cyprinidae	R	VU
25	*Hypselobarbus mussullah* (Sykes, 1839)	Cyprinidae	R	EN
26	*Labeo ariza* (Hamilton, 1822)	Cyprinidae	**R**	**LC**
27	*Labeo bata* (Hamilton, 1822)	Cyprinidae	C	LC
28	*Labeo boga* (Hamilton, 1822)	Cyprinidae	M	LC
29	*Labeo boggut* (Sykes, 1839)	Cyprinidae	M	LC
30	*Labeo calbasu* (Hamilton, 1822)	Cyprinidae	C	LC
31	*Labeo fimbriatus* (Bloch, 1795)	Cyprinidae	M	LC
32	*Labeo gonius* (Hamilton, 1822)	Cyprinidae	M	LC
33	*Labeo rohita* (Hamilton, 1822)	Cyprinidae	A	LC
34	*Osteobrama belangeri* (Valenciennes, 1842)	Cyprinidae	R	NT
35	*Osteobrama cotio* (Hamilton, 1822)	Cyprinidae	M	LC
36	*Osteobrama vigorsii* (Sykes, 1839)	Cyprinidae	C	LC
37	*Osteochilus thomassi* (Day, 1869)	Cyprinidae	M	LC
38	*Osteochilus vittatus* (Valenciennes, 1842)	Cyprinidae	M	LC
39	*Puntius amphibius* (Valenciennes, 1842)	Cyprinidae	M	DD
40	*Puntius carnaticus* (Jerdon, 1849)	Cyprinidae	M	LC
41	*Puntius chola* (Hamilton, 1822)	Cyprinidae	C	LC
42	*Puntius dorsalis* (Jerdon, 1849)	Cyprinidae	M	LC
43	*Puntius parrah* Day, 1865	Cyprinidae	M	LC
44	*Puntius sophore* (Hamilton, 1822)	Cyprinidae	C	LC
45	*Puntius terio* (Hamilton, 1822)	Cyprinidae	C	LC
46	*Pethia ticto* (Hamilton, 1822)	Cyprinidae	C	LC
47	*Rohtee ogilbii* (Sykes, 1839)	Cyprinidae	C	LC
48	*Schismatorhynchos nukta* (Sykes, 1839)	Cyprinidae	R	EN
49	*Tor khudree* (Sykes, 1839)	Cyprinidae	R	LC
50	*Amblypharyngodon microlepis* (Bleeker, 1853)	Danionidae	C	LC
51	*Amblypharyngodon mola* (Hamilton, 1822)	Danionidae	C	LC
52	*Chela laubuca* (Hamilton, 1822)	Danionidae	R	NT

53	*Rasbora daniconius* (Hamilton, 1822)	Danionidae	M	LC
54	*Salmostoma bacaila* (Hamilton, 1822)	Danionidae	C	LC
55	*Salmostoma boopis* (Day, 1874)	Danionidae	M	LC
56	*Salmostoma phulo* (Hamilton, 1822)	Danionidae	M	LC
57	*Salmostoma untrahi* (Day, 1869)	Danionidae	C	LC
VI	**Order GOBIIFORMES**			
58	*Glossogobius giuris* (Hamilton, 1822)	Gobiidae	C	LC
VII	**Order MUGILIFORMES**			
59	*Rhinomugil corsula* (Hamilton, 1822)	Mugilidae	C	LC
VIII	**Order OSTEOGLOSSIFORMES**			
60	*Notopterus notopterus* (Pallas, 1769)	Notopteridae	C	LC
IX	**Order PERCIFORMES**			
61	*Chanda nama* Hamilton, 1822	Ambassidae	A	LC
62	*Parambassis ranga* (Hamilton, 1822)	Ambassidae	C	LC
X	**Order SILURIFORMES**			
63	*Hemibagrus maydelli* (Rössel, 1964)	Bagridae	R	LC
64	*Mystus bleekeri* (Day, 1869)	Bagridae	C	LC
65	*Mystus cavasius* (Hamilton, 1822)	Bagridae	C	LC
66	*Mystus tengara* (Hamilton, 1822)	Bagridae	M	LC
67	*Mystus vittatus* (Bloch, 1794)	Bagridae	C	LC
68	*Rita chrysea* (Day, 1869)	Bagridae	M	LC
69	*Rita gogra* (Sykes, 1839)	Bagridae	M	LC
70	*Rita kuturnee* (Sykes, 1839)	Bagridae	C	LC
71	*Sperata aor* (Hamilton, 1822)	Bagridae	M	LC
72	*Sperata seenghala* (Sykes, 1839)	Bagridae	C	LC
73	*Clarias gariepinus (*Burchell, 1822) *	Clariidae	R	LC
74	*Clarias magur* (Linnaeus, 1758)	Clariidae	R	EN
75	*Heteropneustes fossilis* (Bloch, 1794)	Heteropneustidae	R	LC
76	*Pangasianodon hypophthalmus* (Sauvage, 1878)	Pangasiidae	R	EN
77	*Eutropiichthys goongwaree* (Sykes, 1839)	Schilbeidae	C	DD
78	*Neotropius atherinoides* (Bloch, 1794)	Schilbeidae	C	LC
79	*Proeutropiichthys taakree* (Sykes, 1839)	Schilbeidae	C	LC
80	*Pseudeutropius atherinoides* (Bloch, 1794)	Schilbeidae	C	LC
81	*Silonia childreni* (Sykes, 1839)	Schilbeidae	R	EN
82	*Ompok bimaculatus* (Bloch, 1794)	Siluridae	C	NT
83	*Ompok pabda* (Hamilton, 1822)	Siluridae	M	NT
84	*Wallago attu* (Bloch & Schneider, 1801)	Siluridae	M	VU
85	*Bagarius bagarius* (Hamilton, 1822)	Sisoridae	R	VU
XI	**Order SYNBRANCHIFORMES**			
86	*Macrognathus aral* (Bloch & Schneider, 1801)	Mastacembelidae	M	LC
87	*Macrognathus guentheri* (Day, 1865)	Mastacembelidae	M	LC
88	*Mastacembelus armatus* (Lacepède, 1800)	Mastacembelidae	C	LC

Note: *Exotic, A- Abundant, C- Common, M- Moderate, R- Rare



Channa marulius



Channa striata



Anguilla bengalensis



Hyporhamphus limbatus



Xenentodon cancila



Etroplus suratensis



Oreochromis mossambicus



Oreochromis niloticus



Pseudetroplus maculates



Cirrhinus cirrhosus



Cirrhinus fulungee



Cirrhinus mrigala



Cirrhinus reba



Crossocheilus latius



Cyprinus carpio



Ctenopharyngodon idella



Garra lamta



Gibelion catla



Hypselobarbus dobsoni



Hypselobarbus jerdoni



Hypselobarbus mussullah



Labeo ariza



Labeo bata



Labeo boga



Labeo calbasu



Labeo fimbriatus



Labeo rohita



Osteobrama belangeri



Osteobrama vigorsii



Osteochilus thomassi



Osteochilus vittatus



Puntius amphibious



Puntius chola



Puntius sophore



Puntius terio



Pethia ticto



Tor khudree



Amblypharyngodon mola



Chela laubuca



Rasbora daniconius



Salmostoma bacaila



Salmostoma phulo



Salmostoma untrahi



Glossogobius giuris



Rhinomugil corsula



Notopterus notopterus



Chanda nama



Parambassis ranga



Hemibagrus maydelli



Mystus bleekeri



Mystus cavasius



Mystus tengara



Rita gogra



Sperata aor



Sperata seenghala



Clarias gariepinus



Clarias magur



Heteropneustes fossilis



Pangasianodon hypophthalmus



Silonia children



Ompok bimaculatus



Ompok pabda



Wallago attu



Bagarius bagarius



Macrognathus aral



Macrognathus guentheri



Mastacembelus armatus

Fig. 2. Fishes of Jurala Project

Table 3. Number and per cent composition of species of fishes under various orders

Sl. No.	Order	Number of Species	% of species in an Order
1	Cypriniformes	47	53.41
2	Siluriformes	23	26.14
3	Cichliformes	4	4.55
4	Beloniformes	3	3.41
5	Synbranchiformes	3	3.41
6	Anabontiformes	2	2.27
7	Perciformes	2	2.27
8	Anguilliformes	1	1.14
9	Gobiiformes	1	1.14
10	Mugiliformes	1	1.14
11	Osteoglossiformes	1	1.14

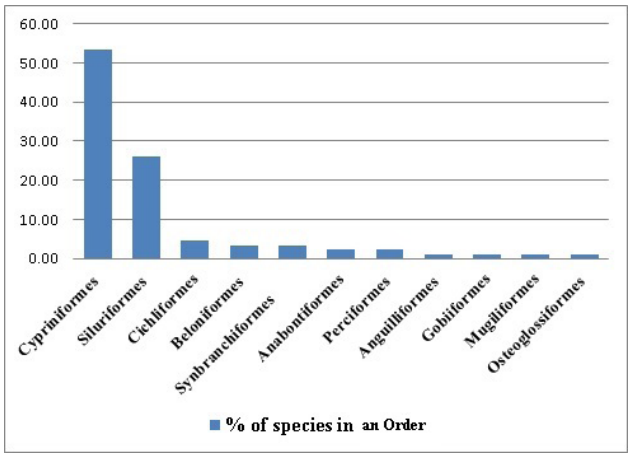


Fig. 3. Percent composition of species of fish under various orders

Table 4. Number and percentage composition of species under various families

Sl. No.	Family	Number of Species	% of species in a Family
1	Ambassidae	2	2.27
2	Anguillidae	1	1.14
3	Bagridae	10	11.36
4	Belonidae	1	1.14
5	Channidae	2	2.27
6	Cichlidae	4	4.55
7	Clariidae	2	2.27
8	Cyprinidae	39	44.32
9	Danionidae	8	9.09
10	Gobiidae	1	1.14
11	Hemiramphidae	2	2.27
12	Heteropneustidae	1	1.14
13	Mastacembelidae	3	3.41
14	Mugilidae	1	1.14
15	Notopteridae	1	1.14
16	Pangasidae	1	1.14
17	Schilbedae	5	5.68
18	Siluridae	3	3.41
19	Sisoridae	1	1.14

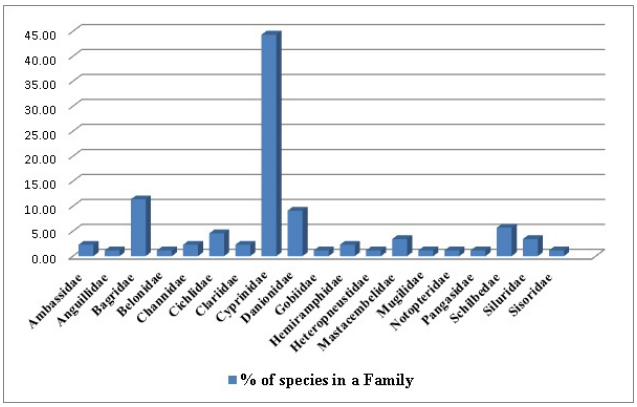


Fig. 4. Percentage composition of species under various families

The number and percentage composition of population status in this reservoir indicated 4 species were abundant which contributed to 4.55%, 33 species were common which contributed highest to 37.50%, 31 species moderate which contributed to 35.23%, and 20 species were rare which contributed to 22.73% in the total catch (Table 5 and Fig. 5).

According to IUCN (2022-1), 3 species contributed to 3.41% are Data Deficient (DD), 68 species contributed to 77.27% are Least Concern (LC), 5 contributed to 5.68% are Near Threatened (NT), and 6 species each contributed to 6.82% are Vulnerable (VU) and Endangered (EN) during the study period (Table 6 and Fig. 6).

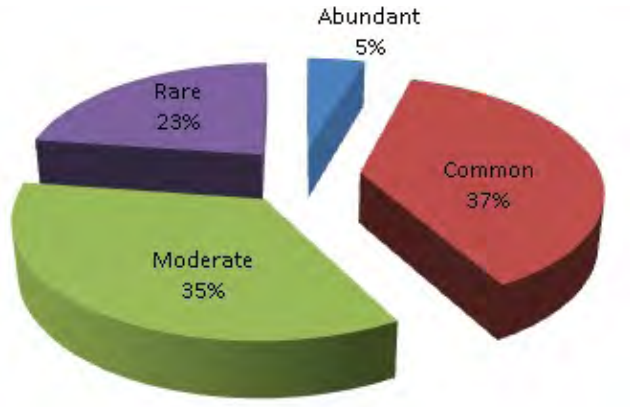


Fig. 5. Population Status of species in Jurala Project

Table 5. Number and percentage composition of population status in the total catch

Species Status	Abundant (A) (76-100%)	Common (C) (51-75%)	Moderate (M) (26-50%)	Rare (R) (1-25%)
Number of species	4	33	31	20
% Composition	4.55	37.50	35.23	22.73

Table 6. Percentage contribution of fish species under the conservation status IUCN

Category	Number of species	% Contribution
DD	3	3.41
LC	68	77.27
NT	5	5.68
VU	6	6.82
EN	6	6.82

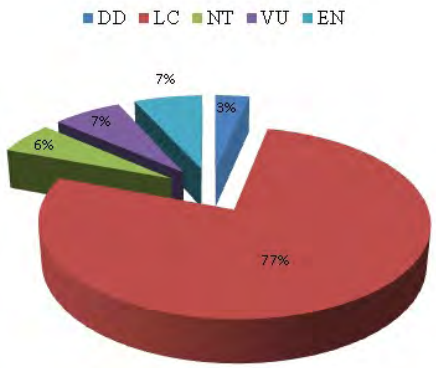


Fig. 6. Percentage of fish species under IUCN Red list status

The fish diversity has been studied by different researchers in the Telangana State and in India. Srikanth *et al.* (2009) reported 22 species from Ramappa Lake in Warangal district Cyprinidae was dominant with 9 species. Sreenivas Reddy and Satya Parameswar (2015) recorded 33 fish species belonging to 7 orders, 22 genera of 13 families from Sarala Sagar reservoir, Telangana. Laxmappa *et al.* (2014) reported 30 species from the Koilsagar Reservoir of Mahabubnagar district in Telangana and Cyprinidae was dominant with 13 species. The similar observations were made represented by Rama Rao and Leela (2016) reported a total of 66 species of fish in Lower Manair Dam (LMD) belonging to 9 orders such as Cypriniformes 27, Siluriformes 13, Perciformes 15, Channiformes 4, Beloniformes 2, Anguilliformes 2, and others 3. Rama Rao *et al.* (2019) reported 48 fish species belonging to 8 orders, 16 families and 31 genera from Wyra reservoir, Telangana. Many investigators represented the similar results such as the number and percentage composition of population status supporting the results of present study.

In the present context of study, it is noticed that indiscriminate harvesting of fish species from their natural habitat is regularly done by the rural people, which may lead to a serious decline in fish population. About 23% of fish species availability was rare; about 7% of species vulnerable and endangered in the project. Through interviewing the local people, it is clear that some commercial and economically important fishes of high market value are currently in very threatened condition.

The emergence of *Clarias gariepinus*, a voracious and carnivorous feeding habit, established itself in this project and became a serious threat to the smaller indigenous fish species. Besides the above factor, overfishing, dynamiting, rampant killing of brood fishes, spawn, fry, fingerlings and juveniles violating Fishery Laws and Act, were assessed to be responsible for the declining trend of fishery in the project. Pesticides washing from agricultural, and sand mining have also created a detrimental environment for fish life in the project. Therefore, the present study indicates that to save this diversity; there is an urgent need for conservation of the fish denizens to conserve the productivity potential of the project through the promulgation of fisheries legislation in future. Thus, some steps and awareness programme is needed to educate people about the importance of the project, its biodiversity and fish productivity.

4. Conclusion

The present study revealed that 88 fish species including 5 exotic species in the Jurala Project, of these 4 species are abundant, 33 are common, 31 are moderate and 20 are rare species in the project. The present work will provide the latest database for reservoir authorities and fisheries department to help them conserve the fish diversity of the Jurala Project. Fishing of threatened species should also be restricted for fishermen. Conservation steps have been found during present investigation that the stopping illegal fishing, identifying crucial breeding habitats and creating mass awareness are needed to save the threatened fish fauna of this reservoir, fishermen and protect divers fish resources.

Acknowledgements

The authors are very grateful to the fisher folk of the various villages of the Jurala Project for their cooperation in the field survey, data and species collection.

5. References

IUCN 2022: The IUCN Red List of Threatened Species. Version 2022-1.

Jayaram KC. 2012: The Freshwater Fishes of Indian Region, Narendra Publication House, New Delhi, 2nd Edition.

Laxmappa B, Jithender Kumar Naik and Vamshi S. 2014: Ichthyofaunal diversity of Koilsagar reservoir in Mahabubnagar District, Telangana, India. International Journal of Fisheries and Aquatic Studies. 2 (3): 23- 30.

Meitei N S, Bhargava V and Patil P M. 2004: Water quality of Purnariver in Purna town, Maharastra state. J. Aqua. Biol., 19: 77-78.

Nelson JS, Grande TC, Mark VH and Wilson MVK. 2016: Fishes of the World. 5th Edn. John Wiley and Sons, New York.

Polis G A, Strong D R, 1996: Food web complexity and community dynamics. Am. Nat., 147 (5): 813-846.

Rama Rao K, Srinivasulu Ch, Ravi Shankar V, Srinivas Kumar G, Venkateswararao M, Amaravathi D and Glory B. 2019: Studies on Ichthyofaunal Diversity of Wyra reservoir in Khammam District, Telangana State, India. Trends in Biosciences 12 (4).

Rama Rao K. 2014: Ichthyo faunal biodiversity in the lower Manair Dam at Karimnagar district; Telangana State: India. Advances in Applied Science Research. 5(5): 237- 248.

Sreenivas Reddy B and Satya Parameshwar K. 2015: Ichthyofaunal Diversity of Saralasagar Reservoir in Mahabubnagar District, Telangana, India. International Journal of Fauna and Biological Studies 2015; 2 (5): 33-41.

Srikanth K, Ramu G, Benarjee G. 2009: The study on Ichthyofaunal diversity of Ramappa lake, Warangal District. A.P. India. J Aqua Biol.; 24 (2): 57-60.

Talwar PK and Jhingran AG. 1999: Inland Fishes of India and adjacent countries. Vols. I and II. Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi.