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An annotated checklist of Ichthyofaunal diversity of Janjhavathi Rubber Dam, A tributary of Nagavali River, Parvathipuram Manyam *Dt. of* Andhra Pradesh

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Abstract
The ichthyofaunal results of the present study revealed that the occurrence of 41 fish species belonging to 11 orders, 18 families, and 30 genera observed June 2021 to May 2023 at various landing stations. During the study period order cypriniformes was dominant with 17 species which contributed to 41.46% of the total species followed by Siluriformes 10 (24.39%), Channiformes 3 (7.31%), Anabantiformes, Synbranchiformes and Perciformes each 2 (4.87%), Anguilliformes, Osteoglossiforme, Cyprinodontiformes, Gobiiformes, and Cichliformes each with 01 (2.43%). In the present investigation omnivores fishes were highest to 48.78%, followed by carnivorous 31.71% and herbivorous represents to 19.51%. The number and Percentage composition of Population Status is 22 species were common which contributed to 53.65%, 12 species were Abundant which contributed to 29.26%, 3 species are moderate which contributed to 7.31% and 4 species were moderate which contributed to 9.75% in the total catch. IUCN-2023 status 35 species contributed to highest with 85.36% are least concern (LC) were observed the Jhanjhavathi Rubber Dam.

Keywords: Ichthyofauna, trophic level, herbivorous, omnivores, carnivorous, IUCN

Introduction

The Indian subcontinent has around 2500 fish species, 930 of which are freshwater and 1570 of which are marine [8]. In Asia 30,700 fish species are reported, whereas in India total 2500 including 801 freshwater fish species have been recorded [4]. It can refer to genotypes within life forms within a fish community as well as species or life forms that occur throughout aquaculture environments [2]. Ichthyofaunal diversity refers to the diversity of fish species that exist, depending on context and magnitude. 8,411 freshwater species and 11,650 marine species make up the world's estimated 21,723 existing fish species. According to Mittermeier & Mitemeir (1997) [11], India is one of the countries with the ninth-highest amount of freshwater mega-biodiversity in the world. One of the fascinating areas of biological research is the study of fish biodiversity and their identification, which provides information on the morphological variations and population diversity among fauna in polluted and unpolluted areas of any given environment [12]. Ichthyofaunal documentation is crucial to understanding the condition of fish species and aids in enabling us to prepare for the future while preserving biodiversity [1]. The first Rubber Dam in India, which was built over the Jhanjhavathi River at Parvathipuram, was officially inaugurated on January 1st, 2006, by Mr. Y.S. Rajsekhara Reddy, the former chief minister of Andhra Pradesh. The Jhanjhavathi Rubber Dam is situated in the hamlet of Rajyalakshmipuram in an Andhra Pradesh district along the northern coast. The Jhanjhavathi River catchment area is 325 sq. miles with 4 TMC of water. One of the primary tributaries of the Nagavali River is the Jhanjhavathi. The Andhra Government started the medium-sized Jhanjhavathi Project in 1976 for the benefit of 10,000 hectares of land in the underdeveloped Vizianagaram district. The purpose of this study is to provide current information on the fish species found in the Rubber Dam.

Fig 1

Fig 2

Fig 3

Fig 4

Fig 5

Fig 6

Jhanjhavathi Rubber Dam 18.863573 N and 83.435136 E (Google courtesy)

Materials and Methods

The Jhanjhavathi Rubber Dam is situated across the Jhanjhavathi River from Rajyalakshmipuram Village in the Parvathipuram Manyam District in northern coastal Andhra Pradesh. The dam is located between latitudes 18.863573 N and 83.435136 E. The entire stretch of the Dam area was the subject of the study, which extended from June 2021 to May 2023 (Figs. 1-6). With the help of local fishermen, the fish were collected from a number of sites using a variety of gear (drag nets, push nets, cast nets, and bamboo basket traps) [17], and the freshly caught fish were thoroughly cleaned and photographed. Before being preserved in a 10% formalin solution, these fish were brought to the lab and fixed in glass jars [7]. Using keys for fishes native to the Indian subcontinent, the fishes were identified up to the species level [22]. The species were identified primarily based on morphometric and meristematic characteristics [3, 7, 8, 10, 13, 14]. The IUCN conservation status of the fish species has been listed (2023).

Result and Discussion

The results of the present study revealed that the occurrence of 41 fish species belonging to 11 orders, 18 families, and 30 genera observed June 2021 to May 2023 at various landing stations. Out of 41 species three are exotic species (*indicates). In the current study, a list of fishes were compiled, including their order, family, genus, species,

population status, trophic level and IUCN status. The listed species were given in Table 1. In the present investigation the number and percentage composition of families, genera and species under different orders are shown in Table 2 and Fig 7. Rama Rao, (2013c) [19] found 49 fish species from 12 orders, 19 families, and 33 genera from February 2021 to January 2023 at Gotta Barage, Hiramandalam. Rama Rao and Ramachandra Rao, (2021) [20] also noticed comparable study results at the Nagavali River near Narayanapuram, Anicut: 56 fish species from nine orders, 19 families, and 34 genera were recorded.

Order cypriniformes was dominant with 17 species which contributed to 41.46% of the total species followed by Siluriformes 10 (24.39%), Channiformes 3 (7.31%), Anabantiformes, Synbranchiformes and Perciformes each 2 (4.87%), Anguilliformes, Osteoglossiforme, Cyprinodontiformes, Gobiiformes, and Cichliformes each with 01 (2.43%). Recorded genera out of 30, Cypiniformies highest with 12 (40.00%), followed by Siluriformes contributed 6 (20.00%), Anabantiformes, Synbranchiformes and Perciformes each 2 (6.66%), Anguilliformes, Osteoglossiformes, Cyprinodontiformes, Channiformes, Gobiiformes, and Cichliformes each 01 (3.33%). Recorded families out of 18, Siluriformes 05 (27.77%), followed by Cypriniformes 03 (16.66%), Anabantiformes 02 (11.11), Anguilliformes, Osteoglossiformes, Cyprinodontiformes, Channiformes, Gobiiformies, Synbranchiformes, and Perciformes each with 01 (5.55%).

Priyanka *et al*., (2021) [16] reported to Cypriniformes dominated with 18 species, followed by the orders Siluriformes with 8, Channiformes with 4, Preciformeswith 3, Clupeiformes and Mastcembeliformes with 2, and the rest of the orders Angulliformes, Beloniformes, and Mugiliformes with a single species. The homogeneous percentage of Order Cypriniformes was contributed to 42.86% of the total species observed in Narayana puram anicut at Nagavali River (Rama Rao and Ramachandra Rao, 2021) [20], Rama Rao (2014b) [21].

In the present study fish species divided into three groups based on trophic level, namely, 2.0–2.5, 2.5–3.5, and 3.5–4.5 (Pauly and Palomeres, 2000) [15]. In the present investigation omnivores fishes were highest to 48.78%, followed by carnivorous 31.71% and herbivorous represents to 19.51% (Fig 8). The trophic level community structure of recorded fish species demonstrated the dominance of top-level carnivores (39%), followed by mid-level carnivores (28%), predators (17%), omnivores (14%), and herbivores or planktivores (2%) (Haojie Su, 2021) [5]. Most of the omnivorous finfish species observed during the research were determined to be protein-rich and suitable for basic human needs.

The number and Percentage composition of Population Status is 22 species were common which contributed to 53.65%, 12 species were Abundant which contributed to 29.26%, 3 species are moderate which contributed to 7.31% and 4 species were moderate which contributed to 9.75% in the total catch (Fig. 9). According to IUCN-2023 [6] status 35 species contributed to 85.36% are least concern (LC), Four species contributed to 9.75% are near threaten (NT), one species contributed to 02.43% are not evaluated (NE) and data deficient (DD) Fig 10. According to Priyanka *et al*., (2021) [16] represents the IUCN red list categories, 52.5% of the species are least concern, 20% are not evaluated, 10% are near threatened, 5 % are data deficient, 5% are lower risk near threatened and vulnerable, and2.5% are lower risk least concern [18-21].

Table 1: List of fishes and their order, family, genus, species, population status and IUCN status at Jhanjhavathi Rubber Dam

No.	Order / Family	Scientific Name	Trophic level	Population Status	IUCN Status
1	Anguilliformes/ Anguillidae	*Anguilla bengalensis*	3.8	R	LC
2	Osteoglossiformes/ Notopteridae	*Notopterus notopterus*	3.5	C	LC
3	Cypriniformes/ Cyprinidae	*Cirrhinus mrigala*	2.4	A	LC
4*	Cypriniformes/ Cyprinidae	*Ctenopharyngodon idella*	2.0	C	LC
5*	Cypriniformes/ Cyprinidae	*Hypopthalmicthys molitrix*	2.0	R	NT
6	Cypriniformes/ Cyprinidae	*Labeo catla*	2.8	A	LC
7	Cypriniformes/ Cyprinidae	*Labeo calbasu*	2.0	C	LC
8	Cypriniformes/ Cyprinidae	*Labeo rohita*	2.2	A	LC
9	Cypriniformes/ Cyprinidae	*Osteobrama cotio*	2.9	C	LC
10	Cypriniformes/ Cyprinidae	*Puntius chola*	2.5	A	LC
11	Cypriniformes/ Cyprinidae	*Puntius ticto*	2.2	A	LC
12	Cypriniformes/ Cyprinidae	*Puntius sophore*	2.6	A	LC
13	Cypriniformes/ Cyprinidae	*Systomus sarana*	2.9	C	LC
14	Cypriniformes/ Danionidae	*Amblypharyngodon microlepis*	3.3	A	LC
15	Cypriniformes/ Danionidae	*Amblypharyngodon mola*	3.3	A	LC
16	Cypriniformes/ Danionida	*Salmostoma phulo*	3.2	C	LC
17	Cypriniformes/ Danionida	*Rasbora daniconius*	3.1	C	LC
18	Cypriniformes/ Danionidae	*Danio devario*	3.0	C	LC
19	Cypriniformes / Cobitidae	*Lepidocephalichthys guntea*	2.7	M	LC
20	Cyprinodontiformes/ Aplocheiidae	*Aplocheilus panchax*	3.8	C	LC
21	Channiformes/ Channidae	*Channa orienalis*	3.8	C	NE
22	Channiformes/ Channidae	*Channa panctata*	3.8	A	LC
23	Channiformes/ Channidae	*Channa striatus*	3.6	C	LC
24	Gobiiformies/ Gobiidae	*Glossogobius giuris*	3.7	C	LC
25	Siluriformes/ Bagridae	*Mystus bleekeri*	3.3	C	LC
26	Siluriformes/ Bagridae	*Mystus cavasius*	3.4	C	LC
27	Siluriformes/ Bagridae	*Mystus gulio*	4.0	R	LC
28	Siluriformes/ Bagridae	*Mystus tengara*	3.2	A	LC
29	Siluriformes/ Bagridae	*Mystus vittatus*	3.1	A	LC

30	Siluriformes/ Claridae	*Clarias batrachus*	3.4	C	LC
31	Siluriformes/ Heteropneustidae	*Heteropneustes fossilis*	3.6	A	LC
32	Siluriformes/ Siluridae	*Ompok bimaculatus*	3.9	C	NT
33	Siluriformes/ Siluridae	*Wallago attu*	3.7	C	NT
34	Siluriformes/ Schibeidae	*Eutropiichthys vacha*	3.9	C	LC
35	Anabantiformes /Anabantidae	*Anabas testudineus*	3.0	M	DD
36	Anabantiformes / Badide	*Badis badis*	3.3	R	LC
37*	Cichliformes / Cichlidae	*Oreochromis mossambicus*	2.2	M	NT
38	Synbranchiformes / Mastacembelidae	*Mastacembelus armatus*	2.8	C	LC
39	Synbranchiformes / Mastacembelidae	*Macrognathus pancalus*	3.5	C	LC
40	Perciformes / Ambassidae	*Chanda nama*	3.9	C	LC
41	Perciformes / Ambassidae	*Parambassis ranga*	3.6	C	LC

A= Abundant (76-100%); C = Common (51-75%); M = Moderate (26-50%); R = Rare (1-25%) of the total catch.

EN- Endangered; VU- Vulnerable: LC- Least concern; DD- Data deficient; NE- Not evaluated, NT: Near threaten.
*Exotic fishes No.s: 4, 5 and 37

Table 2: Number and percent composition of families, genera and species of fishes under various orders

S. No	Orders		% of families in an order		% of genera in an order		% of species in an order
1	Anguilliformes	1	5.55	1	3.44	1	2.43
2	Osteoglossiformes	1	5.55	1	3.44	1	2.43
3	Cypriniformies	3	16.66	12	41.37	17	41.46
4	Cyprinodontiformes	1	5.55	1	3.44	1	2.43
5	Channiformes	1	5.55	1	3.44	3	7.31
6	Gobiiformies	1	5.55	1	3.44	1	2.43
7	Siluriformes	5	27.77	6	20.68	10	24.39
8	Anabantiformes	2	11.11	2	6.89	2	4.87
9	Cichliformes	1	5.55	1	3.44	1	2.43
10	Synbranchiformes	1	5.55	1	3.44	2	4.87
11	Perciformes	1	5.55	2	6.89	2	4.87
		18		29		41	

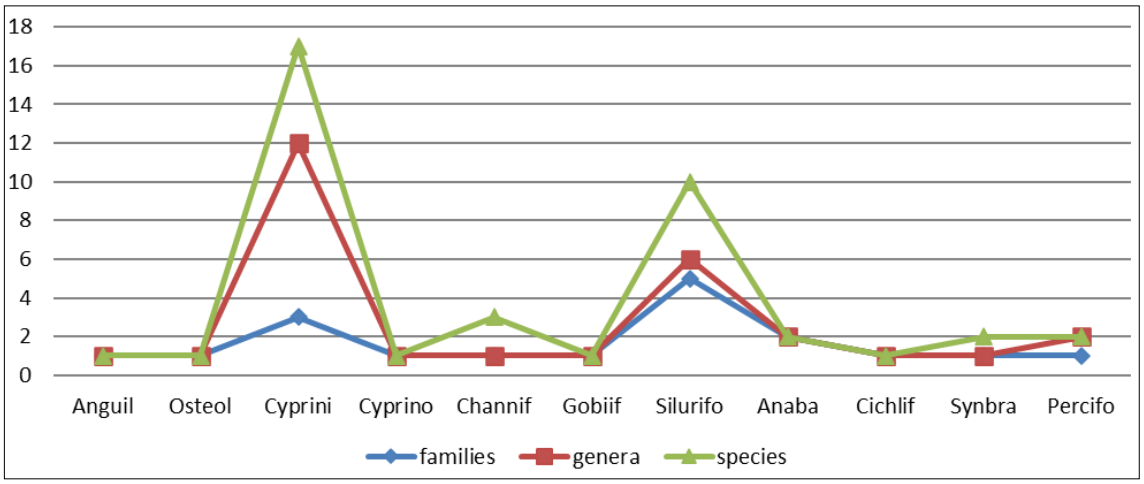


Fig 7: percent composition of fishes under various orders

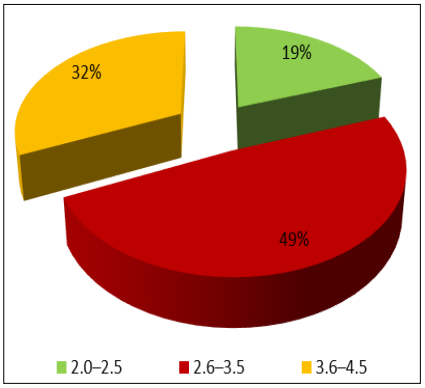


Fig 8: Trophic level

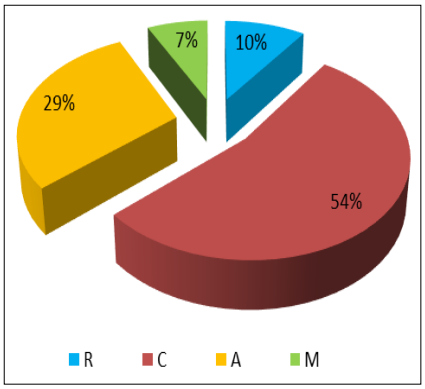


Fig 9: Population status

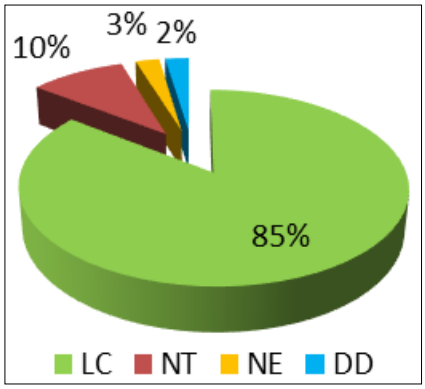


Fig 10: IUCN status

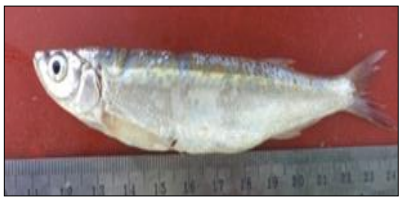
Notopterus notopterus

Labeo catla

Labeo rohita

Cirrhinus mrigala

Labeo calbasu



Salmostoma phulo

Cyprinus carpio

Ctenopharyngodon Idella

Systomus sarana

Channa panctata

Channa striatus

Mastacembelus armatus

Macrognathus pancalus

Anguilla bengalensis

Glossogobius giuris

Mystus cavasius

Mystus vittatus

Mystus tengara

Ompok bimaculatus

Heteropneustes fossilis

Anabas testudineus

Oreochromis niloticus

Frequently available edible fish species at Janjhavathi Rubber Dam

Conclusion

Order cypriniformes was dominant fishery of the total catch at monsoon periods followed by Siluriformes and Channiformes. Artisanal fishing includes a wide range of low-tech, low-investment, small-scale fishing methods. The water level lowers substantially throughout the summer months.

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References

1. Bose AK, Jha BC, Suresh VR, Das AK, Parashar A, Ridhi. Fishes of the middle stretch of river Tawa, Madhya Pradesh, India. Journal of Chemical, Biological and Physical sciences,2013:3(1):706-716.
2. Burton PJ, AE Balisky, LP Coward, SG Cumming, DD Kneshwaw. The value of managing biodiversity. The Forestry Chronicle,1992:68(2):225-237.
3. Day F. The fishes of India, being a natural history of the fishes known to inhabit the seas and freshwater of India, Burma and Ceylon, text and atlas, London, William Dawson and Sons Ltd, 1958, 195-198.
4. Fish Base. Concepts, design and data sources. ICLARM, Los Baños, Laguna, Philippines, 2000, 344.
5. Haojie Su, Yuhao Feng, Jianfeng Chen, Jun Chen, Suhui Ma, Jingyun Fang, *et al*. Determinants of trophic cascade strength in freshwater ecosystems: a global analysis Ecology,2021:0(0):e03370.
6. IUCN Red List of threatened species, version 2023. www.iucnredlist.org**.**
7. Jayaram KC. The freshwater fishes of the Indian region. Narendra Publicatin New Delhi, India, 1999, 551.
8. Jayaram KC. The Freshwater Fishes of Indian Region Narendra Publication House, New Delhi, 2nd Edition**,** 2011.
9. Kaur H, Datta SN, Singh. A Fish Catch Composition and Biodiversity Indices at Harike Wetland- A Ramsar Site in India. J. Anim. Res.,2017:7(5):935-941.
10. Menon AGK. Check list - freshwater fishes of India, Records of the Zoological Survey of India, Occasional, 1999, 175-366.
11. Mittermeier RA, CG Mitemeir. Megadiversity Earth's biologically wealthiest Nation. In mc Allister, D.E. A Lttamiltion and B. Harvery (Eds)., Global S.V. Rankhamb /Rec Res Sci Tech 3 (2011) 11-1313 fresh water Biodiversity sea wind Cemex, Mexico city, 1997, 1-140.
12. Mukesh Kumar Napit. Study of fish fauna of Bundelkhand region with special reference to Damoh district. International journal of advance research,2013:1(4):24-30.
13. Munro ISR. The Marine and Freshwater Fishes of Ceylon. Biotech Books, Delhi, 2000.
14. Nath P, Dey SC. Fish and Fisheries of North Eastern India (Arunachal Pradesh). Narendra Publishing House, Delhi, 2000, 217.
15. Pauly D, Palomeres ML. Approaches for dealing with three sources of bias when studying the fishing down marine food web Phenomenon. Proceedings of a CIESM Workshop, Kerkyra, Greece, 2000, 61-66.
16. Priyanka S, Patode BS, Salve, Pawar RT. Ichthyofaunal diversity and conservation status of Siddheshwar reservoir district Hingoli, Maharashtra, India. International Journal of Zoology and Applied Biosciences,2021:6(6):293-298.
17. Rama Rao K. A study on fishing craft and gear in Lower Manair Dam, Karimnagar Dt. Andhra Pradesh, India. International Journal of Multidisciplinary Educational Research,2014a:35(2):56-68.
18. Rama Rao K. Ichthyo faunal bio diversity in the lower Manair Dam at Karimnagar district; Telangana State: India Pelagia Research Library. Advances in Applied Science Research,2014b:5(5):237-248..
19. Rama Rao K. Ichthyofaunal diversity of Gotta Barrage at Hiramandalam, Vamsadhara River, Srikakulam Dt. Andhra Pradesh, India. International Journal of Zoology Studies,2023c:8(2):23-28.
20. Rama Rao K, Ramachandra Rao R. Ichthyofaunal Diversity of Narayanapuram Anicut at Nagavali River, Srikakulam District of Andhra Pradesh, India. Uttar Pradesh Journal of Zoology,2021:42(19):24-35.
21. Rama Rao K, Vinod Kumar Mudumala. Ichthyofaunal biodiversity in the Sunamudi Gedda a tributary of Mahendratanaya, Eastren Ghats at Venkatavarada Rajapuram, Mandasa, Srikakulam Dt. Andhra Pradesh, India. International Journal of Multidisciplinary Educational Research,2017:8(2):35-61.
22. Talwar PK, Jhingran AG. Inland fishes of India and Adjacent Countries, Balkemra, Rotterdam, Vol. A, 1991.