ISSN: 0976-3031

Available Online at http://www.recentscientific.com

CODEN: IJRSFP (USA)

International Journal of Recent Scientific Research
Vol.13, Issue, 10 (A), pp. 2438-2441, October, 2022

International Journal of Recent Scientific Research

DOI: 10.24327/IJRSR

Research Article

ICHTHYOFAUNAL DIVERSITY OF LAKHNAPUR FRESHWATER TANK AT VIKARABAD DISTRICT OF TELANGANA STATE, INDIA

K. Sugunavathi

Tara Government College (A), Sangareddy Dt., Telangana State, India.

DOI: http://dx.doi.org/10.24327/ijrsr.2022.1310.0497

ARTICLE INFO

Article History:

Received 15th September, 2022
Received in revised form 26th September, 2022
Accepted 16th October, 2022
Published online 28th October, 2022

Keywords:

Ichthyofauna, Family, Genera, Species, Population status, IUCN, CAMP status

ABSTRACT

Freshwater fish diversity in Lakhnapur tank at Parigi mandal, Vikarabad district, was observed from February 2021 to January 2022. The study stated that the occurrence of thirty-three fish species belonging to nine orders, 13 families, and 23 genera, including three exotic species. In the recorded 13families, Cypiniformies contributed 30.77% of species, followed by Siluriformes (15.38%), Osteoglossiformes, Cyprinodontiformes, Channiformes, Gobiiformes, Synbranchiformes, Cichliformes, and Perciformes, each with 2.94%. The generic composition of fishes belonging to different families shows that Cyprinidae and Danionidae contributed to 21.73%, Cichlidae and Ambassidae contributed to 8.69%, Notopteridae, Cobitidae, Xenocyprididae, Aplocheilidae, Bagridae, Siluridae, Channidae, Mastacembelidae, Cichlidae and Ambassidae contributed to 4.34%. The IUCN classifies 87.87% of species as least concern (LC), 6.06% as vulnerable (VU), and 3.03% as near threatened (NT) or not evaluated (NE).

INTRODUCTION

Telangana State has the third largest inland water resource in India with a 5.7 lakh ha water spread area suitable for fishing with 77 large, medium and minor reservoirs and about 24,189 tanks. Fishing is one of the fastest growing industries in the state, accounting for 0.5 percent of total GDP and providing employment, nutritional security, and income resources. The Lakhnapur freshwater tank is one of the most important for irrigation and fishing resources in the Parigi Mandal, Vikarabad district. It is located between the coordinates 17.211007 E and 77.834495 N. The total area of the tank is about 200 acres with a 0.3 TMC water storage capacity and is useful for 2645 acres of agricultural crops (Fig. 1& 2). It was constructed in the year 1965-68. India is one of the nine mega-freshwater biodiversity areas in the world. 2,500 species of fish have been identified, of which 930 species are freshwater and 1,570 species are marine (Jayaram, 2010). The freshwater fish diversity is drastically depleted by the influence of over-exploitation, habitat destruction, and invaded exotic fish species. Streams, canals, and rivers have a global impact on a variety of environmental issues that are largely caused by anthropogenic activities. Inland fishing based on canals and tanks is a major source of income for the fishing communities. There were no ichthyofaunal reports from Lakhnapur freshwater tank and its surrounding area of Parigi mandal.

Fig: 1. Google image of Lakhnapur Tank

Fig:2 Lakhnapur Tank

Corresponding author:* **K. Sugunavathi
Tara Government College (A), SangareddyDt., Telangana State, India.

Fig:3 Stationary gill net

MATERIALS AND METHODS

Study area:

The Ichthyafaunal study was carried out from February 2021 to January 2022 at various locations in the Lakhnapur freshwater tank area. The fish were collected from distant sites with the help of local fishermen by using different types of gear (Drag nets, Push nets, Cast nets, Stationary Gill Nets) Rama Rao (2014a) Fig: 3, 4, 5. Collected fish are washed thoroughly and photographed in their fresh condition. These fish were brought to the laboratory for fixing in glass jars and preserving in a 9–10% formalin solution (Jayaram, 1999). The fish were identified to the species level, including exotic fishes, with the help of the keys for fishes of the Indian subcontinent. Identification of the species was carried out mainly on the morphometric and meristematic characters (Day, 1958; Jayaram, 1999, 2011; Talwar and Jhingran, 1991; Nath and Dey, 2000; Biju Kumar, 2000; Munro 2000). The conservation status of the fish species has been listed based on IUCN (2022) and CAMP (1998).

Fig. 4 Fishing at surplus gates

Fig. 5 Catching fish by Hooks

Fig: 6 Artificial fishing hooks

RESULTS

The results of the study of the ichthyofaunal diversity in Lakhnapur freshwater tank at Parigi mandal from February 2021 to January 2022 The study stated that the occurrence of thirty-three fish species belongs to nine orders, 13 families, and 23 genera, including three exotic species. Table 1 shows a list of Lakhnapur freshwater tank fishes recorded in the current study, including their order, family, genus, species, IUCN and CAMP status. In the present study, the number and percentage composition of families, genera, and species under different orders are shown in Table 2.

In the recorded 13families, Cypiniformies contributed 30.77% of species, followed by Siluriformes (15.38%), Osteoglossiformes, Cyprinodontiformes, Channiformes, Gobiiformes, Synbranchiformes, Cichliformes, and Perciformes, each with 2.94%. Recorded out of 23 genera, Cypiniformies contributed the highest with 52.17%, followed by Siluriformes with 8.69%, Osteoglossiformes, Cyprinodontiformes, Perciformes, Channiformes, Gobiiformes, Synbranchiformes, and Perciformes each with 4.34%. Recorded 33 ichthyofaunal species, Cypriniformes contributed to 51.51% of the total species, followed by Siluriformes with 15.15%, Channiformes with 9.09%, Cichliformes and Perciformes each with 6.06%, Osteoglossiformes, Cyprinodontiformes, Synbranchiformes, and Gobiiformes each with 3.03% (Table 2; Fig 7).

In the present investigation, it is revealed that the number and percent composition of genera and species under 13 families were recorded in Fig 8. The generic composition of fishes belonging to different families shows that Cyprinidae and Danionidae contributed to 21.73%, Cichlidae and Ambassidae contributed to 8.69%, Notopteridae, Cobitidae, Xenocyprididae, Aplocheilidae, Bagridae, Siluridae, Channidae, Mastacembelidae, Cichlidae and Ambassidae contributed to 4.34%. The species composition of fishes belonging to different families has revealed that the family Cyprinidae was the highest, making up 30.30%, followed by Danionidae that contributed to 15.15%, Bagridae contributed to 12.12%, Channidae contributed to 9.09%, Cichlidae and Ambassidae each contributed to 5.06%. Notopteridae, Cobitidae, Aplocheilidae, Xenocyprididae, Siluridae, Gobiidae, and Mastacembelidae constituted 3.03% of each of the total fish species (Fig 8).

The number of fish species and percentage composition of population status is highest for common, which contributed to 39.39%, followed by abundant, which contributed to 36.36%, rare, which contributed to 18.18%, and moderate, with 6.06% (Table. 3, Fig 9). According to the IUCN, 87.87% of species were classified as least concern (LC), 6.06% as vulnerable (VU), and 3.03% as near threatened (NT) or not evaluated (NE) (Table. 3, Fig 10). As per

CAMP status, low risk near threatened (LR nt) contributed to 42.42%, not evaluated (NE) contributed to 30.30%, 15.15% of species of fish are vulnerable (VU), 6.06% is data deficient (DD), and 3.03% is low risk least concerned (LRlc) and near threatened (Table. 3, Fig. 11).

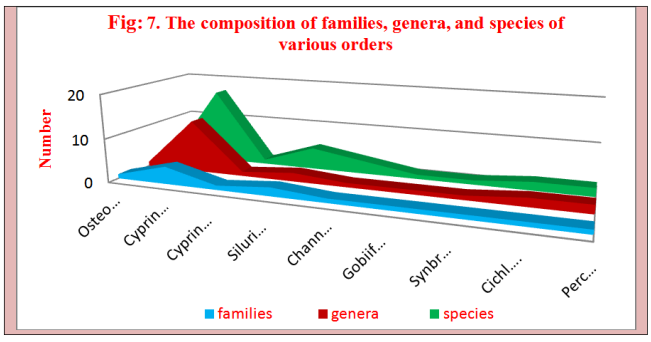
Table 1 The list of fishes in the Lakhnapur freshwater tank includes their order, family, scientific name, population status, IUCN and CAMP status

Order / Family	No.	Scientific Name	Population Status	IUCN Status (2022)	CAMP Status 1998
Osteoglossiformes/	**I**				
1. Notopteridae (1)	1	*Notopterus notopterus*	C	LC	LRnt
Cypriniformes/	**II**				
2. Cyprinidae (10)	2	*Catla catla*	A	LC	LRnt
	3	*Labeo ariza*	C	LC	NE
	4	*Labeo calbasu*	C	LC	LRnt
	5	*Labeo rohita*	A	LC	LRnt
	6	*Cirrhinus mrigala*	A	LC	LRnt
	7*	*Cyprinus carpio*	M	VU	NE
	8	*Garra gotyla*	A	LC	VU
	9	*Puntius ticto*	A	LC	LRnt
	10	*Puntius sarana*	C	LC	VU
	11	*Puntius sophore*	A	LC	LRnt
3. Cobitidae (1)	12	*Lepidocephalichthys guntea*	M	LC	LRnt
1. Danionidae (5)	13	*Amblypharyngodon mola*	A	LC	LRlc
	14	*Danio devario*	C	LC	NE
	15	*Salmostoma bacaila*	A	LC	DD
	16	*Salmostoma phulo*	C	LC	NE
	17	*Rasbora daniconius*	C	LC	LRnt
2. Xenocyprididae (1)	18*	*Ctenopharyngodon idella*	R	NE	NE
Cyprinodontiformes/	**III**				
6. Aplocheiidae (1)	19	*Aplocheilus panchax*	C	LC	DD
Siluriformes/	**IV**				
7. Bagridae (4)	20	*Mystus bleekeri*	C	LC	VU
	21	*Mystus cavasius*	C	LC	LRnt
	22	*Mystus tengara*	A	LC	NE
	23	*Mystus vittatus*	A	LC	VU
8. Siluridae (1)	24	*Wallago attu*	R	VU	NT
Channiformes/	**V**				
9. Channidae (3)	25	*Channa marulius*	R	LC	LRnt
	26	*Channa panctata*	A	LC	LRnt
	27	*Channa striatus*	C	LC	LRnt
Gobiiformes/	**VI**				
10. Gobiidae (1)	28	*Glossogobius giuris*	C	LC	LRnt
Synbranchiformes/					
11. Mastacembelidae (1)	29	*Mastacembelus armatus*	R	LC	VU
Cichliformes	**VII**				
12. Cichlidae (2)	30	*Etroplus suratensis*	A	LC	NE
	31*	*Oreochromis mossambicus*	C	NT	NE
Perciformes/					
13. Ambassidae (2)	32	*Chanda nama*	R	LC	NE
	33	*Parambassis ranga*	R	LC	NE

A= Abundant (76-100%); C = Common (51-75%); M = Moderate (26-50%); R = Rare (1-25%) of the total catch.
EN- Endangered; VU- Vulnerable: LRnt- Lower risk near threatened; LRlc- Lower risk least concern; LC- Least concern; DD- Data deficient; NE- Not evaluated, NT: Near threaten.
*Exotic fishes No.s: 7, 18 and 31.

Table 2 The number and percentage composition of fish families, genera, and species in various orders

S.No	Orders	% of families in an order	% of genera in an order	% of species in an order
1	Osteoglossiformes	7.69	4.34	3.03
2	Cypriniformies	30.77	52.17	51.51
3	Cyprinodontiformes	7.69	4.34	3.03
4	Siluriformes	15.38	8.69	15.15
5	Channiformes	7.69	4.34	9.09
6	Gobiiformes	7.69	4.34	3.03
7	Synbranchiformes	7.69	4.34	3.03
8	Cichliformes	7.69	8.69	6.06
9	Perciformes	7.69	8.69	6.06



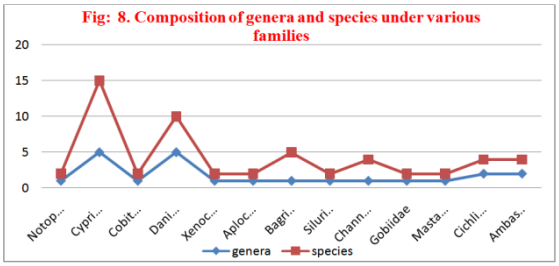
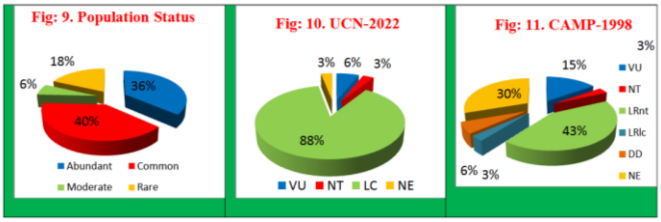


Table 3 The percentage occurrence of population status, IUCN (2022), and CAMP (1998)

Population Status		Abundant	Common	Moderate	Rare	-	-	-
	% contribution	36.36	39.39	6.06	18.18	-	-	-
Category		**VU**	**NT**	**LRnt**	**LRlc**	**LC**	**DD**	**NE**
IUCN (2022)	% contribution	6.06	3.03	-	-	87.87	-	3.03
CAMP (1998)	% contribution	15.15	3.03	42.42	3.03	-	6.06	30.30



DISCUSSION

The present survey of the ichthyofaunal diversity was conducted in the Lakhnapur freshwater tank at Parigi mandal from February 2021 to January 2022. The results stated that the occurrence of thirty-three fish species belongs to nine orders, 13 families, and 23 genera, including three exotic species. recorded 33 ichthyofaunal species in the Lakhanapur tank Cypriniformes contributed most to 51.51% of the total species, followed by Siluriformes with 15.15%, Channiformes with 9.09%, Cichliformes and Perciformes each with 6.06%, and Osteoglossiformes, Cyprinodontiformes, Synbranchiformes, and Gobiiformes each with 3.03%. Sanjay Paunikar et al. (2012) represented 16 species of Cypriniformes, 7 species of Siluriformes, 3 species of Synbranchiformes, 6 species of Perciformes, and 1 species of Beloniformes, have been recorded. Laxmappa et al. (2014) conducted a survey in the Koilsagar Reservoir and reported a total of 30 fish species belonging to 6 orders, 12 families, and 22 genera were recorded during the study. The Cyprinidae were the most dominant group. Biju Kumar (2000) explained the impact of exotic fishes on aquatic biodiversity in India and the freshwater community. Kante Krishna Prasad et al. (2020) recorded 57 fish species belonging to 42 genera within 20 families and 11 orders of Manjeera Reservoir. Similar results were earlier obtained by Vijayalaxmi *et al.* (2010), Renuka and Heena Mubeen (2014).

Of the 19 families represented, the Siluriformes contributed the most, with 31.57%, followed by the other represented families. The ichthyofaunal diversity of Saralasagar Reservoir comprises of 13 families. The dominance of encountered was Cyprinidae with 36.36% > Bagridae (15.15%) > Channidae (12.12%) > Cichlidae (9.09%) > Siluridae, Claridae, Heteropneustidae, Ambassidae, Gobiidae, Notopteridae, Hemiramphidae, Anguillidae and Mastacembelidae each with 3.03% reported by Sreenivas Reddy and Satya Parameshwar (2015) and Renuka and Heena Mubeen (2014). Similar results were reported in the present Lakhanapur freshwater tank.

During the study period, 23 genera were reported. The Cypiniformies contributed the highest with 52.17%, followed by Siluriformes with 8.69%, Osteoglossiformes, Cyprinodontiformes, Perciformes, Channiformes, Gobiiformes, Synbranchiformes, and Perciformes each with 4.34%. Most of the investigators repoted to equal results at various reservoirs like Rama Rao et al. (2019). reported genera out of 31, Cypiniformies contributed 38.71% of species followed by Siluriformes and Perciformes with 22.58%,Osteoglossiformes, Anguilliformes, Beloiniformes, Channiformes, and Mogiliformes each with 3.23% in Wyra reservoir. Rachamalla Shyamsundar et al. (2017) reported a total of 38 species of fish belonging to seven orders, 15 families, and 32 genera were identified. Cypriniformes dominated with 14 species, followed by Perciformes with 10 species, Siluriformes with nine species, and Beloniformes with two species.

As part of our study, we observed the number of fish species and percentage composition of population status was represented highest for common, which contributed to 39.39%, abundant 36.36%, rare 18.18%, and moderate 6.06%. According to the IUCN, progressive species are classified as progressive like least concern (LC), vulnerable (VU), near threatened (NT), and not evaluated (NE). The CAMP status is low risk near threatened, vulnerable, data deficient, and low risk least concerned (LRlc) and near threatened. The other investigators reported the fish faunal diversity at various reservoirs in south and north India (Srinivas Kumar and Rajender (2021), Rama Rao 2014b).

CONCLUSIONS

The present work provides the latest database of the 33 fish species and is the first ever documentation of the fish fauna of the Lakhnapur freshwater tank at Parigi mandal, Vikarabad district. The study reveals that there are a sufficient number of species contributing significantly towards the river fishery. All the species have high edible value and are in high abundance in the monsoon period when fish species become highly captured. The study revealed that the most dominant species are minnows and major carps.

Acknowledgements

The author would like to thank the Commissioner, Commissionerate of Collegiate Education, Telangana State, and Smt. M. Praveena, FAC principal,Tara Government College (A), Sangareddy Dt., for providing necessary facilities.

References

1. Biju Kumar, A. 2000. Exotic fishes and freshwater fish diversity. Zoos' print journal, 15 (11), 363-367.
2. CAMP. 1998. Conservation and Management Plan for Freshwater Fishes of India". Organized by Zoo Outreach Organisation, NBFGR, Lucknow.
3. Day, F. 1958. 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., pp 195-198.
4. IUCN Red List of threatened species, version 2022. www.iucnredlist.org down loaded on June 2022.
5. Jayaram, K. C. 1981. The freshwater fishes of India, Pakistan, Bangladesh, Burma and Sri Lanka- A Handbook. Zoological Survey of India, Culcutta, 475.
6. Jayaram, K.C. 1999. The Freshwater Fishes of the Jhingran, A.G. and Pathak. 1987. Ecology.
7. Jayaram, K.C. 2010. The freshwater fishes of the Indian region. Narendra Publishing House, Delhi, 614.
8. Jayaram K.C., 2011. The Freshwater Fishes of Indian Region Narendra Publication House, New Delhi, 2nd Edition.
9. Laxmappa B, S. Jithender Kumar Naik and S. Vamshi. 2014. Ichthyofaunal diversity of Koilsagar reservoir in Mahbubnagar district, Telangana, India International Journal of Fisheries and Aquatic Studies, 2(3): 23-30.
10. Kante Krishna Prasad, Mohammad Younus, and Chelmala Srinivasulu,. 2020. Ichthyofaunal diversity of Manjeera Reservoir, Manjeera Wildlife Sanctuary, Telangana, India. 12 (10), Pp: 16357–16367.
11. Munro, I. S. R. 2000. The Marine and Freshwater Fishes of Ceylon. Biotech Books, Delhi.
12. Nath, P. and S. C. Dey. 2000. Fish and fisheries of North Eastern India (Arunachal Pradesh). New Delhi. Narendra Publishing House, pp. 217.
13. Prasad, K.K., M. Younus and C. Srinivasulu. 2020. Ichthyofaunal diversity of Manjeera Reservoir, Manjeera Wildlife Sanctuary, Telangana, India. Journal of Threatened Taxa 12(10), 16357–16367.
14. Rama Rao. K. (2014a). A Study on Fishing Craft and Gear nn Lower Manair Dam, Karimnagar Dt. Andhra Pradesh, India. International Journal of Multidisciplinary Educational Research. 3: 5(2).
15. Rama Rao K., (2014b). Ichthyo faunal bio diversity in the Lower Manair Dam at Karimnagar district; Telangana State: India. Advances in Applied Science Research, 5(5):237-248.
16. Rama Rao K. Srinivasulu Ch, Ravi Shankar V, Srinivas Kumar G,Venkateswararao M, Amaravathi D, Glory B. 2019. Studies on Ichthyofaunal Diversity of Wyra reservoir in Khammam District, Telangana State, India. Trends in Biosciences 12 (4).
17. Renuka K., and Heena Mubeen. 2014. Checklist on Ichthyofaunal Diversity of Katisanghavi (Bhima river) and Tntni (Krishna river) of Northern Karnataka. *Int.J.Enviorn.* 3 (.4), Pp. 183-184; 2014.
18. Rachamalla Shyamsundar, Kante Krishna Prasad and Chelmala Srinivasulu. 2017. Ichthyofauna of Udayasamudram Reservoir in Nalgonda District, Telangana State, India, 9 (12), Pp. 11087–11094.
19. Sanjay Paunikar, Ashish Tiple, S.S. Jadhav and S.S. 2012. Talmale. Studies on Ichthyofaunal Diversity of Gour River, Jabalpur, Madhya Pradesh, Central India. World Journal of Fish and Marine Sciences, 4 (4), 356-359.
20. Sreenivas Reddy B., K Satya Parameshwar. 2015. Ichthyofaunal Diversity of Saralasagar Reservoir in Mahabubnagar District, Telangana, India. International Journal of Fauna and Biological Studies, 2(5), 33-41.
21. Srinivas Kumar G and G. Rajendar, 2021. Ichthyofaunal diversity of Kinnerasani Reservoir in Bhadradri Kothagudem District ff Telangana, India. *Uttar Pradesh Journal ff Zoology*, Volume 42, (22), pp 138-149.
22. Talwar.P.K., and A.G. Jhingran. 1991. Inland fishes of India and adjacent countries, Vol. 1&2. Oxford and IBH Publishing Co. Pvt.Ltd., 1158pp.
23. Vijayalaxmi ,C.,Rajasekhar, M and Vijaykumar, K. 2010. Fresh water fishes distribution and diversity status of Mullameri River, a minor tributary of Bheema River of Gulbarga District,Karnataka.*Int.J.Syst.Biol*., 2(2):1-9.