

RESEARCH ARTICLE

Ichthyofaunal diversity in contaminated site and normal site of Nagaram Lake, Warangal.

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ABSTRACT

In the present study we made an attempt to assess the fish diversity in polluted region and normal regions of the Nagaram lake, Warangal district, Telangana. The complete drainage water of Warangal urban area passed away from the city and entering into the Nagaram Lake from the past three decades. During the study period 28 different fish species belongs to six orders were observed in this lake. The fish dominance order is cypriniformes, siluriformes, perciformes, channiformes osteoglossiformes and antheriformes respectively. Among the 28 species *Catla catla*, is the dominant fish species followed by *Labeo rohita*, and *Cirrhinus mrigala* in normal region. *Clarias batracus*, is dominant fish species in drainage blending region followed by *Heteropneustus fossilis*, *Channa punctatus* and *Anabas*.

Key words: Nagaram, Fish, Drainage, Warangal, Ichthyofauna.

INTRODUCTION

Wetlands play a major role in the earth by providing unique habitats for a wide variety of flora and fauna. The shallow fresh water habitats are the most productive systems on the earth and support natural communities of great beauty and diversity. These wetlands are subjected to pollution mainly from domestic sewage as well as other solid and liquid pollutants generated by human and anthropogenic activities. Nagaram lake is one of the biggest lake in this area and it spread over the area of 24 kilometers. This lake was constructed by Kakatiya rulers for the purpose of irrigation and human consumption. It is 12 km far away from Warangal city. Warangal city is second largest city in Telangana state, spreading across 158 sq. miles with a population of 9 lakhs above. Nowadays this lake becoming gradually polluted due to drainage discharge of Warangal city.

It is estimated that around 20% of the dry lands of the planet are already completely desertified and that the desertified areas will increase considerably in the coming decades (Balakrishna *et al.*, 2013). Aquatic pollution mainly affect on fish species. Fish are relatively sensitive to

changes in their surrounding aquatic environment including an increase in pollution. The main resource to the pollution an aquatic fauna in especially lakes is agricultural runoff and domestic discharge. The basic objective of the present study is made an attempt to observe fish species diversity in both normal and drainage whisking cites.

MATERIAL AND METHODS

Fishes were collected by using the gill net, drag net, hand net, cast net and purely help of local fishermen society of Nagaram village during the 2015-16. Collected fish photographed immediately and the specimen were preserved in 10 % formalin after

giving abdominal cut then brought to laboratory for identification. The fish were identified with standard identification keys (Days volumes- 1875, 1878; Jayaram, 1991; Talwar and Jhingran, 1991 and Gupta, 2006).

RESULTS AND DISCUSSION

The present study involves the ichthyofaunal diversity of nagaram lake in two different regions during the year 2015-2016. The marked regions are one is drainage water blending site and another one is agricultural water irrigated site. The agricultural water runoff site is considered as normal site. The ichthyofaunal diversity represented in seasonally.

Table 1: Showing the ichthyofaunal diversity of Nagaram lake, Warangal Urban district

ORDER	FAMILY	SCIENTIFIC NAME	LOCAL NAME
Cypriniformes	Cyprinidae	<i>Catla catla</i>	Bocha
		<i>Labeo rohita</i>	Rohu
		<i>Cirrhinus mrigala</i>	Merigelu
		<i>Cirrhinus reba</i>	Argu
		<i>Cyprinus carpio carpio</i>	Bangaru teega
		<i>Labeo calbasu</i>	Kaki botcha
		<i>Puntius chola</i>	Parka
		<i>Puntius sarana sarana</i>	Gunda parka
		<i>Esomus denricus</i>	Atta pakka
		<i>Rasobora elanga</i>	Katte kodipe
	Cobitidae	<i>Amblypharyngodon microlepis</i>	Kodipe
		<i>Lepidocephalus guntea</i>	Ulshe
Siluriformes	Bagridae	<i>Mystus bleeker</i>	Jella
		<i>Mystus vittatus</i>	Erra jella
	Siluridae	<i>Wallago attu</i>	Waluga chepa
		<i>Ompok bimaculatus</i>	Buggadomma
	Claridae	<i>Clarius batracus</i>	Marpoor chepa
Osteoglossiformes	Heteropneustidae	<i>Heteropneustus fossilis</i>	Inglikam
	Notoptiridae	<i>Notopterus notopterus</i>	Vollenka
Channiformes	Channidae	<i>Channa striatus</i>	Murrel
		<i>Channa orientalis</i>	Malapankidi
		<i>Channa punctatus</i>	Motta pilla
	Belontidae	<i>Xenontodon cancilla</i>	Nainikuntalu
Perciformes	Nandidae	<i>Nandus nandus</i>	Pandi parka
	Anabanctidae	<i>Anabas testudineus</i>	Burkalu
	Gobidae	<i>Glossogobius giuris giuris</i>	Ushkedanthi
	Mastacembilidae	<i>Mastacembelus punctatus</i>	Chinni papera
		<i>Mastacembelus armatus</i>	Papera

In the present study the total 28 different species belongs to fourteen families belongs to six orders were observed. The observed families belongs to Cypriniformes order were Cyprinidae and Cobitidae. The Cyprinidae family species are *Catla Catla*, *Labeo rohita*, *Labeo calbasu*, *Cirrihinus reba*, *Cirrihinus mrigala*, *Cyprinus carpio carpio*, *Puntius sarana sarana*, *Puntius Chola*, *Esmos denricus*, *Amblypharyngodon microlepis*, *Rosbora elanga* and Cobitidae family species is *Lepidocephalus guntea*. The observed families belong to Siluriformes order were Bagridae, Siluridae, Clariidae and Heteropnuestidae. The Bagridae family species are *Mystus bleekar* and *Mystus vittatus*, The Siluridae family species are *Wallago attu* and *Ompak bimaculatus*. The Clariidae family species is *Clarius batracus* and the Heteropnuestidae family species is *Heteropneustus fossilis*. Only one species is observed belongs to Osteoglossiformis order and Notopteridae family is *Notopterus notopterus*. *Channa orientalis*, *Channa punctatus* and *Channa sriatus* species were observed belongs to Channidae family of Chenniformes order. During the present investigation the four different family species were observed belongs to Perciformis order. The observed species is *Nandus nandus* belongs to Nandidae family, *Glossogobius giuris giuris* belongs to Gobidae family, *Anabaus testudineus* belongs to Anabantidae family and *Mastacembulus armatus* and *Mastacembulus punctatus* species were belongs to Mastacembelidae family Only one species is observed from Belonidae family of Antheriformes order, *Xenontodon cancilla*.

During the summer season the total twenty five fish species were observed throughout the study period in normal site and twenty one species were observed in drainage mixing site. In normal site the dominated species order is *Catla catla*, *Labeo rohita*, *Cirrihinus mrigala*, *Cyprinus carpio carpio*. The following species are not observed in summer season in normal site, *Lepidocephalus guntea*, *Mystus vittatus* and *Esmos denricus*. In drainage blending site the fishes dominance order is *Clarius batracus*, *Heteropnustus fossilis* and *Channa punctatus*. The following species are not observed in summer season in drainage blending site, *Glossogobius giuris giuris*, *Lepidocephalus guntea*, *Mystus vittatus*, *Esmos denricus*, *Mastacembulus punctatus*, *Ompak bimaculatus* and *Puntius Chola*. The intra-annual environmental differences, short-term changes, such as those of the day/night cycle, can also affect the interactions between the distribution and abundance of fish communities (Noakes, 1992;

Halfman, 1993; Axenrot et al., 2004). The ichthyofaunal diversity is partially depends on the environmental variables which always affect the competing populations. Estuaries are areas of physical and biological transition between the land, freshwaters, and the sea (Chowdhury et al., 2009). The main reasons for reduction in species diversity are long term change in hydrological and meteorological parameters. Heavy fresh water discharge from the lake brings sediment and causes siltation and makes water turbid which ultimately affects on the number of fish species.

During the South west monsoon season the total twenty eight species were observed throughout the study period in normal site and twenty five species were observed in drainage mixing site. In normal site the dominated species order is *Catla catla*, *Labeo rohita*, *Cirrihinus mrigala*, *Cyprinus carpio carpio*. In drainage blending site the fishes dominance order is *Clarius batracus*, *Heteropneustus fossilis* and *Channa punctatus*. The following species are not observed in summer season in drainage blending site, *Lepidocephalus guntea*, *Cirrinus mrigala* and *Channa sriatus*. Heavy fresh water discharge from the lake brings sediment and causes siltation and makes water turbid which ultimately effects on the number of fish species. Reasons for the variation were ascribed to the large volume of water during the wet season, available fish were now dispersed over a wider area, and fishing became more difficult. Similar results were observed by Srinivasa Reddy et al., (2015).

During the North east monsoon season the total twenty eight species were observed throughout the study period in normal site and twenty six species were observed in drainage mixing site. In normal site the dominated species order is *Catla catla*, *Labeo rohita*, *Cirrihinus mrigala*, *Cyprinus carpio carpio*. In drainage blending site the fishes dominance order is *Clarius batracus*, *Heteropneustus fossilis* and *Channa punctatus*. The following species are not observed in summer season in drainage blending site, *Cirrihinus mrigala* and *Lepidocephalus guntea*. Temperature is the important factor for the aquatic biota. According to FAO report (FAO., 2010), the increase of temperature directly or indirectly impacts species distribution and the seasonality of production in fishes. The present lake water temperature is ranges between 22°C to 30°C throughout the study period and this is greatly suitable for fish culture. Similar results were observed by Srikanth et al.,(2009).

During the study period the most abundant species in the normal site is *Catla Catla*, *Labeo rohita*, *Cirrihinus reba*, *Cirrihinus mrigala*, *Cyprinus carpio carpio*, *Amblypharyngodon microlepis*, *Mysus bleekar* and *Channa striatus*. The most abundant species in the drainage blending site is *Lebeo calbasu*, *Puntius sarana sarana*, *Rasobora elanga*, *Wallago attu*, *Clarius batracus*, *Heteropneustus fossilis*, *Channa punctatus*, *Mastacembelus armatus* and *Anabaus testudineus*.

CONCLUSION

The present study shows distinguished variation of fishes in both normal selected site and drainage blending site. In drainage blending site the ichthyofaunal diversity is very low when compared to normal selected site. This may be due to entry of different chemicals and metals in to the lake and availability of low quantity of dissolved oxygen in drainage blending site. Continuing of this process leads to extension of drainage blending region and it will affects on ichthyofaunal diversity.

Conflicts of interest: The authors stated that no conflicts of interest.

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