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Ichthyofaunal diversity of somasila reservoir, Nellore district, Andhra Pradesh

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Abstract

Present survey was undertaken to study ichthyofaunal diversity of the Somasila Reservoir situated in Nellore district, Andhra Pradesh, India and was carried out from January-2019 to December-2019. A total of 19 fish species belonging to 6 orders, 9 families and 14 genera were recorded. Based on species representation, Order Cypriniformes was the most dominant group (7 species) followed by orders Perciformes (5 species), Siluriformes (4 species), Osteoglossiformes (1 species), Anguilliformes (1 species) and Gobiiformes (1 Species). Along with these fish species, *Macrobrachium rosenbergii* was also encountered in catches. As usual in many instances, Cyprinidae was the most dominant family in this reservoir. The detailed taxonomic account of these species is documented in this paper.

Keywords: Somasila reservoir, ichthyofaunal diversity, Nellore district, Andhra Pradesh

1. Introduction

India is the second largest fish producer in the world with a total production of 13.7 million metric tonnes in 2018-19 of which 65 per cent was from inland sector. Almost 50 percent of inland fish production is from culture fisheries, which constitutes 6.5 per cent of global fish production. The inland fishery resources of the country are vast and comprise of the 'rivers and canals', reservoirs, 'tanks and ponds', estuaries, lakes, backwaters, floodplain lakes etc. Reservoirs in India are prime resources for inland fisheries. They cover a total area of 3.15 million ha, out of which small reservoirs occupy 1.49 million ha followed by large and medium reservoirs covering 1.14 million ha and 0.52 million ha respectively [6]. Reservoirs nicknamed as sleeping giants have been identified as the nearest possible alternative source of fish production. However, this vital resource is not contributing to the inland fish production of the country to the extent it should. The average productivity is nearly 30 Kg/ha against the production potential of 250 Kg/ha. The low fish yield from reservoirs is mainly due to unscientific management practices resulting from the inadequate knowledge of the ecology, production functions and biodiversity of the systems [2]. Andhra Pradesh is endowed with rich freshwater resources. It has second largest river delta consisting river systems of Krishna and Godavari rivers in the country. There are 110 reservoirs in Andhra Pradesh with an extent of 1, 90,204.05 ha with effective water spread area of 1, 20,235.28 ha. And average production is about 150 kg/ha.

Reservoirs conserve a variety of native riverine fish species as well as introduced species, thus supports commercial fisheries. The understanding of fish faunal diversity of reservoirs is a major aspect for the exploitation and the sustainable as well as economical management of these. The thorough knowledge of fishery resources, their availability and distribution in a particular water body is essential for proper utilization of its fishery resources [4]. Many studies have been made on ichthyofaunal diversity of various freshwater bodies in India during the last few decades. But, as far as Somasila Reservoir is concerned poor attention has been paid towards the systematic investigation on diversity of fish fauna. So, it is felt that there is a need to generate the information on diversity of fishes from Somasila Reservoir. Hence, to fill this gap, the present investigation on ichthyofaunal diversity of Somasila Reservoir was undertaken.

2. Materials and methods

2.1 Study site description

Somasila Reservoir is constructed across River Pennar near Somasila village of Ananthasagaram Mandal in Nellore District of Andhra Pradesh. It is mainly constructed for the purpose of irrigation and power generation. The construction of dam was commenced in the year 1976 and completed during the year 1989.

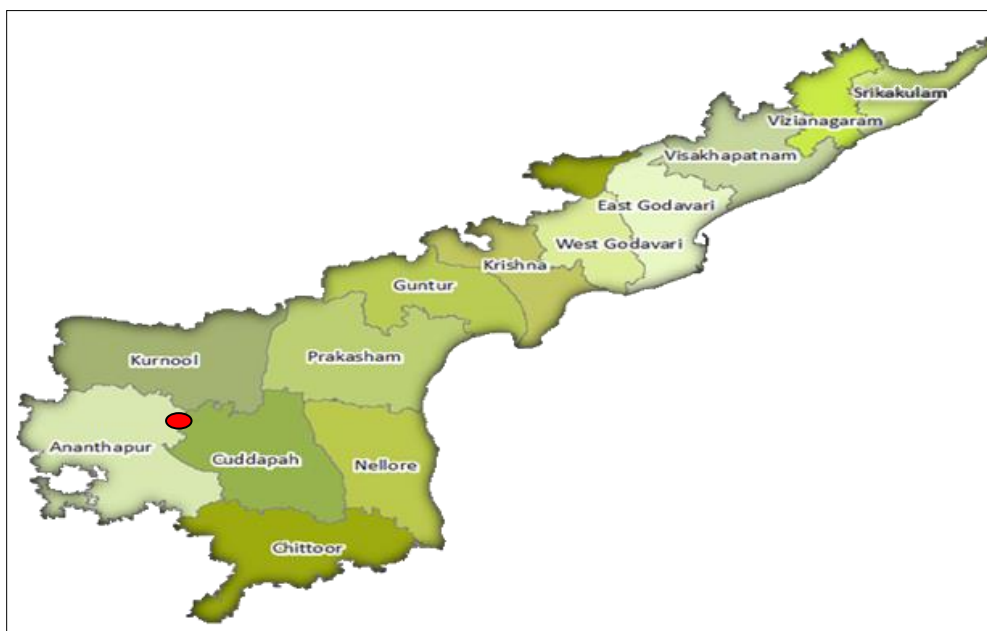
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Table 1: Salient features of Somasila Reservoir

SI. No.	Attribute	Value
1	Location of the Reservoir	14°29'15'' North latitude and 79°18'25'' East longitude.
2	Nearest city	Nellore 90 km
3	District	Nellore
4	State	Andhra Pradesh
5	River	Pennar
6	Villages benefited	101
7	Mandals benefited	15
8	Purpose	Irrigation
9	Dam type	Earth-filled gravity dam
10	Height above lowest foundation (m)	39
11	Length of Dam (m)	760.75
12	Catchment area (Sq.Km)	48,645
13	Total Water Spread Area (Km ²)	212.28
14	Full Reservoir Level (FRL) (m)	100.58
15	Maximum water level (m)	101.80
16	Gross storage capacity (TMC)	77.988
17	Designed spillway capacity (m ³ /sec)	22375.00
18	Average Monsoon rainfall (cm)	103.17

**Fig 1:** Location of Somasila Dam in Andhra Pradesh**Fig 2:** Somasila reservoir**Fig 3:** Aerial view of Somasila dam

2.2 Fish sampling design

Fishes were collected from Somasila reservoir, Nellore district with the help of local fisherman using different types

of nets like gill net, cast net and hooks at monthly intervals from January 2019 to December 2019. After collection, fishes were preserved in 10% formaldehyde solution. The fishes

were identified on the basis of morphometric characters, meristic counts and descriptive characters. Morphometric characters include measurable characters such as Total length of the body, Standard length of the body, Length and depth of the head, Diameter of the eye, Length of snout, Maximum and minimum girth, length of dorsal fin, depth of dorsal fin, depth of anal fin, length of pectoral fin, length of ventral fin, distance between pectoral and ventral fin, length of caudal fin etc. Meristic characters include Dorsal fin rays, Pectoral fin rays, Ventral fin rays, anal fin rays, caudal fin rays, Lateral line scales, Lateral line transverse scales and so on. Descriptive Characters includes Profile and Shape of the body, Skin texture and coloration, Position and shape of the mouth, lips and snout, Barbels and jaws, Scales and lateral line system, Origin, shape, size and type of median, paired and caudal fins and special markings. The detailed

examination and identification of species were carried out with the help standard keys mentioned in the taxonomic literature [1, 3, 5].

3. Results and discussion

During the present study a total of 19 fish species belonging to 9 families and 14 genera were recorded from Somasila Reservoir. On the basis of percentage composition and species richness, order Cypriniformes was dominant (7 species) followed by Perciformes (5 species), Siluriformes (4 species), Osteoglossiformes, Anguilliformes and Gobiiformes (1 species each) (Table 2). The sequence of dominance of encountered fish orders is, Cypriniformes (36.84%) > Perciformes (26.31%) > Siluriformes (21.05%) > Anguilliformes (5.26%) = Osteoglossiformes (5.26%) = Gobiiformes (5.26%) (Fig. 4).

Table 2: Ichthyofaunal diversity of Somasila reservoir

S. N	Scientific name	Local name	Family	Global conservation status		Remarks
				IUCN	CITES	
Order: Cypriniformes						
1	<i>Catla catla</i> (Hamilton, 1822)	<i>Bochha</i>	Cyprinidae	LC	NE	Food fish
2	<i>Cirrhinus mrigala</i> (Hamilton, 1822)	<i>Yerra mosa</i>	Cyprinidae	LC	NE	Food fish
3	<i>Cirrhina reba</i> (Hamilton, 1822)	<i>Arju</i>	Cyprinidae	LC	NE	Food fish
4	<i>Labeo calbasu</i> (Hamilton, 1822)	<i>Kaki bontha</i>	Cyprinidae	LC	NE	Food fish
5	<i>Labeo fimbriatus</i> (Bloch, 1795)	<i>Gandu menu</i>	Cyprinidae	LC	NE	Food fish
6	<i>Labeo rohita</i> (Hamilton, 1822)	<i>Gandi</i>	Cyprinidae	LC	NE	Food fish
7	<i>Puntius sarana</i> (Hamilton, 1822)	<i>Kanuga pakki</i>	Cyprinidae	LC	NE	Food fish/ Ornamental fish
Order: Perciformes						
8	<i>Etroplus suratensis</i> (Bloch, 1754)	<i>Karimeen</i>	Cichlidae	LC	NE	Food fish
9	<i>Oreochromis niloticus</i> (Linnaeus, 1758)	<i>Nile tilapia</i>	Cichlidae	LC	NE	Food fish
10	<i>Oreochromis mossambicus</i> (Peters, 1852)	<i>Mozambique tilapia</i>	Cichlidae	NT	NE	Food fish
11	<i>Channa striata</i> (Bloch, 1793)	<i>Korra menu</i>	Channidae	LC	NE	Food fish
12	<i>Channa marulius</i> (Hamilton, 1822)	<i>Matta</i>	Channidae	LC	NE	Food fish
Order: Siluriformes						
13	<i>Clarius batrachus</i> (Linnaeus, 1758)	<i>Magur</i>	Clariidae	LC	NE	Food fish
14	<i>Heteroneustes fossilis</i> (Bloch, 1794)	<i>Ingilayee</i>	Heteropneustidae	LC	NE	Food fish / Game fish
15	<i>Ompok bimaculatus</i> (Bloch, 1794)	<i>Theenuva</i>	Siluridae	NT	NE	Food fish/ Ornamental fish
16	<i>Wallago attu</i> (Bloch & Schneider, 1801)	<i>Valuga</i>	Siluridae	NT	NE	Food fish / Game fish
Order: Anguilliformes						
17	<i>Anguilla bengalensis</i> (Gray, 1834)	<i>Maluga</i>	Anguillidae	NT	NE	Food fish/Game fish
Order: Osteoglossiformes						
18	<i>Notopterus notopterus</i> (Pallas, 1769)	<i>Ulakathatta</i>	Notopteridae	LC	NE	Food fish
Order: Gobiiformes						
19	<i>Glosogobius giuris</i> (Hamilton, 1822)	<i>Isika dondu</i>	Gobiidae	LC	NE	Food fish

LC: Least Concern, NT: Near Threatened, NE: Not Evaluated,

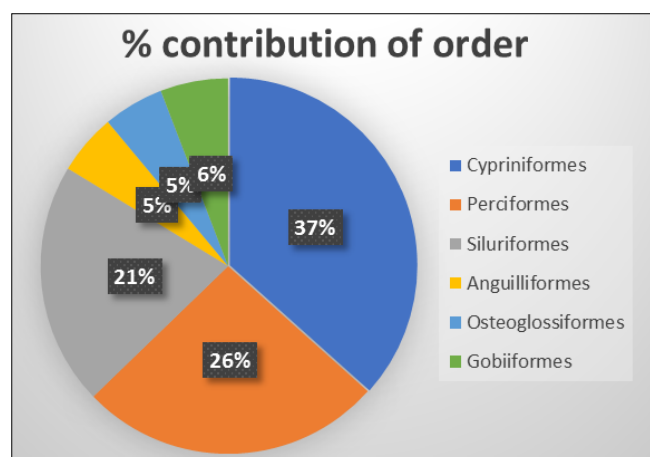


Fig 1: Order – wise fish species composition and dominance in Somasila Reservoir.

4. Conclusion

The present study is conducted for the detailed documentation of ichthyofauna in the Somasila Reservoir of Nellore district in Andhra Pradesh state. Somasila Reservoir has good potential for fish fauna represented by 19 species of fish. The fish community in this reservoir include invasive species such as *Clarius batrachus*, *Oreochromis mossambica* and *Oreochromis niloticus*. These may affect the production of major carp species; hence necessary steps need to be taken to control the proliferation of these species and enhancement of fishery productivity pertaining to other species and especially the Indian Major Carps. Fishing holiday during the breeding season and mesh size regulation should be strictly followed to conserve spawning stock and also to increase the long-term sustainable yield. The enhanced production of fisheries may be obtained through implementing stock enhancement, species enhancement, and nutrient enhancement programmes.

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