International Journal of Zoology Studies
ISSN: 2455-7269; Impact Factor: RJIF 5.14
www.zoologyjournals.com
Volume 2; Issue 3; May 2017; Page No. 25-28

A check list of fishes in freshwater lentic ecosystem of Shrungarbandh Lake District Gondia MS

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Abstract
In Gondia district many of water bodies are being exploited for aquaculture through fishermen's co-operative societies supported by state fisheries department. The present study is made one of such water body, the beautiful Shrungarbandh Lake. The Shrungarbandh Lake (33 ha) is situated at Bondgaon (Surban) near Bagh-Itiadoh water irrigation Project. In present investigation the fishes were collected by fisherman and identified during 2015-2016. Total 22 fish species were collected & identified belongs to 5 orders, 13 families & 21 genera. The order cypriniformes consists of family Cyprinidae, was the most dominant family having 8 species, order Perciformes consists of 6 families i.e. family Centropomidae (1 species), family Nandidae (1 species), family Gobidae (1 species), Anabantidae (1 species), Ophicephalidae (2 species) and family Mastacembalidae (1 species), order Siluriformes consists of 4 families i.e. family Bagridae (1 species), family Siluridae (2 species), family Claridae (1 species) and family Heteropneustidae (1 species), order Steoglossiformes consists of family Notopteridae (1 species) and order Atheriniformes consists of family Belonidae (1 species). It reveals that the Shrungarbandh Lake is rich in fish population. The proper management, conservation of native fish fauna and utilization is essential for sustenance of a heritage like Shrungarbandh Lake.

Keywords: fish diversity, Shrungarbandh Lake, conservation, management

Introduction
Lakes are dynamic inland aquatic systems that supports & maintain a balanced adaptive community of organisms having diverse species composition and the functional organization of all the organisms supports a unique biotic integrity. These major life support systems are facing ecological degradation today due to undesirable anthropogenic activities. Fish is responsive to alterations in water quality due to various anthropogenic processes from their catchment. It has been recognized as suitable for biological assessment due to its easy identification and economic value (Siligato & Bohmer, 2001). Fish assemblies have widely been used as ecological monitors to assess & determine the level of degradation and health of water bodies at different scales (Vijayalaxmi *et al*., 2010) [25]. Plafkin *et al*., (1989) [22] monitored that there are many advantages of using fish diversity as a biological indicator. Earlier studies have been made in fresh water fish diversity in India notably by Hamilton (1822) [6]; Hora (1943, 1951, 1953) [8, 9, 10]; Misra (1959) [18]; Menon (1999) [16]; Dey (1973) [5]; Jayaram (1999); Talwar & Jhingran (1991) [24]. Many authors also were described the fish diversity in Maharashtra. Kulkarni *et al*., (2008) studied fish & fisheries of Derala tank, district Nanded, Nikam *et al*., (2014) studied fish diversity at Asthi Lake, Sholapur, Mirgane *et al*., (2016) [17] reported 210 fish species from Katphal Lake, Solapur, Kalbande *et al*., (2007) [13] noticed 29 fish species from Rawanwadi Lake, Bhandara, Bobdey (2014) [3] collected 63 species from Bhandara. Paliwal *et al*., (2013) [20, 21] recorded 35 fish species from Bagh-Itiadoh Dam Reservoir, Gondia, Paliwal, G. T., (2013) [20, 21] reported 51 fish species from Navegaonbandh Reservoir of district Gondia, Maharashtra. The main objective of the present study was to know the knowledge regarding fish diversity in Shrungarbandh Lake with reference to their economic importance. Some remedial measures for the improvement in the fishery are suggested to maintain the health such beautiful heritage.

Material and Methods
Fishes were collected with the help of local fisherman and identified following the keys of Misra, (1959) [18]; Qureshi and Qureshi, (1983) [23]; Talwar and Jhingran, (1991) [24] and Day, (1994). The economic importance of the fishes was done by following the proforma given by Lagler (1956) [15].

Description of Study area
Shrungarbandh lake is situated near Bondgaon (Surban) located at (20^0 47'39.1" N, 080^0 08'44.1" E), representing the lentic ecosystem surrounded by paddy fields affected by fishing & agricultural activities. The visual estimate of the catchment area is around 33 ha. It is manmade lake which receives water from Bagh-Itiadoh Dam and rainfall. It is flanked by agricultural fields on three sides. The water body is utilized by peoples mainly for irrigation, fishing & drinking purposes. Shrungarbandh Lake has biological potential and rich in flora & fauna. This lake is more productive because of the nutrients from adjoining watershed gets, accumulated in the form of compost, sediments etc. The enrichment of organic constituents is responsible for the growth of aquatic weeds, phytoplankton & zooplankton. Therefore, the lake is a good wetland habitat for availability of food items of various organisms. This place was very famous for existing of a pair of Sarus Cranes, many tourists and nature lovers visited here only to see the beautiful birds. The pair was successfully breeding there and well protected by the villagers. There was a pair of Sarus Crane inhabiting the lake from last 50 year (Bhandarkar, 2008) [2]. The authors were visited and surveyed the birds in this area from last thirteen years. This Lake has a predominant place in capture fisheries of

this region, contributing towards the livelihood of thousands of people who live around and depend on it for paddy and fish production.

Observations & Results

The results of present study confirms the occurrence of 22 fish species belonging to 05 orders & 13 families (Table: I). The order Cypriniformes was dominant with 08 species to be followed by order Perciformes with 07 species, followed by order Siluriformes with 05 species, while orders like Steoglossiformes & Atheriniformes were represented by one species. Out of total 22 species recorded 16 species were common (C), 3 species were Exotic (Exo), 2 species were Uncommon (U) & 1 species was found to be Endangered (EN).

Table: 1: Fish diversity in Shrungarbandh Lake

S.No	Zoological Name	Common Name	Status	Remarks
I	Class : Osteichthyes SubClass :Actinopterygii Order: Steoglossiformes Sub-order : Notopteridae Family : Notopteridae			
1.	*Notopterus chitala*(Hamilton)	Chital	C, PF	It is a commercially important food fish
II	Order : Cypriniformes Sub-order : Cyprinoidei Family : Cyprinidae			
	Sub-family : Cyprininae			
2.	*Catla catla*(Hamilton)	Catla	C,FF	One of the fastest growing fish & good food Value
3.	*Cirrhinus mrigala*(Hamilton)	Mrigal	C,FF	It is an excellent species for stocking the ponds
4.	*Ctenopharyngodon idella* (Valenciennes)	Grass Carp	Exo, PF	Introduced in India from Japan in 1959 (V.G. Jhingran 1983)
5.	*Cyprinus carpio* (Linnaeus)	Common Carp	Exo, PF	Introduced in India from Bangkok in 1957 (V.G.Jhingran 1983)
6.	*Hypopthalmichthys molitrix* (Valenciennes)	Silver Carp	Exo, PF	Introduced in India from Hong Kong in 1959 (V.G. Jhingran 1983)
7.	*Garra lamta* (Hamilton)	Stone Sucker	C,FF	Lower lip produced in to suctorial disc species found in shallow waters browse on algae covering rocks
8.	*Labeo rohita*(Hamilton)	Rohu	C,FF	It is esteemed excellent as food & great economic importance
9.	*Puntius ticto*(Hamilton)	Khavli barb	C,WF	Consumed by locals
	Family : cobitidae			
III	Order : Siluriformes Family : Bagridae			
10.	*Mystus seenghala* (Sykes)	Shigta	C, PF	It is a predatory fish
	Family : Siluridae			
11.	*Ompok bimaculatus* (Bloch)	Butter Catfish	C, FF	It is a excellent food fish
12.	*Wallago attu* (Schneider)	Boal	C, PF	Species is good for eating and also good game fish
	Family : Clariidae			
13.	*Clarias batrachus* (Linnaeus)	Magur	EN, PF	As per IUCN 1988 & Menon 2004
	Family : Heteropneustidae			
14.	*Heteropneustes fossilis* (Bloch)	Stinging Cat fish	C, FF	It is considered to be very good nourishing & tasty fish
IV	Order : Atheriniformes Sub-order : Exocoetoidei Family : Belonidae			
15.	*Xenentodon cancila* (Hamilton)	Freshwater Gar fish	C,FF	This fish is good for eating with pot-herbs
V	Order : Perciformes Sub-order : Percoidei Family : Centropomidae			
16.	*Chanda ranga* (Hamilton)	Indian Glass fish	C, WF	Good aquarium fish
	Family : Nandidae			
17.	*Nandus nandus* (Hamilton)	Mottled Nandus	C, FF	Good food value
	Family : Chchlidae			
	Sub-order : Gobioidei Family : Gobiidae Sub-family : Gobinae			
18.	*Glossogobius giuris* (Hamilton)	Bar-Eyed Goby	U, FF	It is a good food fish
	Sub-order : Anabantoidei Family : Anabantidae			
19.	*Anabas testudineus* (Bloch)	Climbing perch	C, WF	Due to presence of accessory respiratory organ it is hardy and has good flavor
	Sub-order : Channidei Family : Ophiocephalidae			
20.	*Ophiocephalus punctatus* (Bloch)	Spotted Snake head	C, PF	This fish prolific breeder and development is rapid
21.	*Ophiocephalus marulius* (Hamilton)	Giant snake head, Marad	U, PF	It is favorite sporting species and highly esteemed as food
	Sub-order : Mastacembeloidei Family : Mastacembelidae			
22.	*Mastacembalus armatus* (Lacepede)	Spiny Eel	C, FF	It is a good food fish

(Common: C, Uncommon: U, Exotic: Exo, Endangered: EN, Predatory: PF, Weed: WF, Food: FF)

Discussion

The genetic imprinting of various populations of lentic fish species is essential since the fresh water ecosystem constitute crucial parts of their life support systems by providing nursing grounds and feeding areas (Hammer *et al*., 1993) [7]. Further species diversity is a property at the population level while the functional diversity concept is more strongly related to ecosystem stability and stresses, physical & chemical factors for determining population dynamics in the lentic ecosystem. Natural waters have more stable conditions under which the fish evolve hence enlisting biodiversity and its distribution over time and space is important from the point of variations in fish fauna over time & space and enables to frame the strategies for sustainable use of water & also for its conservation. India is one of the mega diversity countries in the world & occupies the ninth position in terms of fresh water fish diversity (Mittermier & Mittermier, 1977). In India, there are c. 2,500 species of fishes; of which c. 930 live in fresh water and c. 1570 are marine (Kar, 2003 a). However there is no information is available on fishes from Shrungar Bandh Lake; hence attempt has been made to present piscine inventory from this well-known water body. The present investigation reveals the occurrence of 22 fish species in which the order Cypriniformes is dominated with a numerical strength of 08 species, followed by Perciformes with 07 species, Siluriformes with 05 species, Steoglossiformes & Atheriniformes with one species each. Among the total 22 species recorded 16 species were found to be common & 02 species were moderately found. *Clarias batrachus* has been listed endangered (IUCN 1988 & Menon, 2004) & *Notopterus chitala* were Vulnerable in their threat status (IUCN 1988). Some exotic fish species such as *Ctenopharyngodon idella*, *Hypopthalmicthy smolitrix*, *Cyprinus carpio*, were also reported during the present study (V.G. Jhingran, 1983). In this Lake the species *Anabas testudineus* (Climbing perch) is not a resident spp but appears to have been introduced along with the fish seed from West Bengal. Out of the 22 species recorded 11 (50%) fish species are recognized as food fishes (FF), 08 (36%) species are predatory (PF) and remaining 03 (14%) species are weed fishes (WF). Predatory fishes not only compete with the cultured species for food and space but also directly prey on them. Predatory fishes breed earlier than the major carps and their young once feed vigorously on the plankton available in the pond and grow so fast. When carp spawns released into pond, the predators are large enough to take heavy toll of the spawn. The adults of the predatory fishes even feed on fry and fingerlings of major carps. Majority of the weed fishes are profuse breeders, though these fishes do not prey on the cultured species, these are the active competitors with the major carps for the food available in the pond. They generally consume large quantities of zooplankters, the main food of carp spawn (Chaudhari, 1960). The young weed fishes directly feed on carp hatchlings and spawn (Alikunhi, (1957) [4].

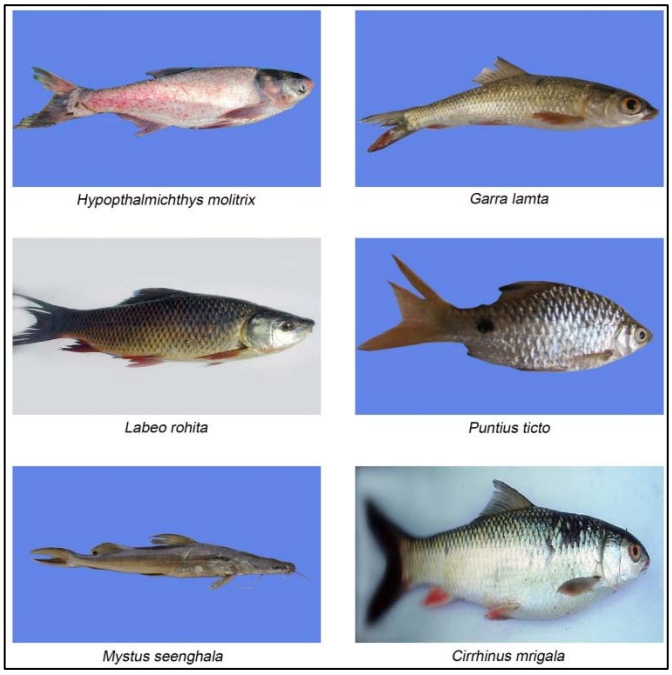

Fig 1

Fig 2

Conclusion

From this investigation it is concluded that the lake is a highly productive aquatic system, benefits the communities around. However, now a days the Lake faces constant threats from various man made problems such as anthropogenic impact, dumping of sewage, siltation, weed infestation, occurrence of exotic (non-native) fish species, predatory fishes & weed fishes, collectively responsible for the degradation of the lake biodiversity, ecology & fishery. This study will provide future strategies for development of fish management. For promoting a sustainable fishery of the Shrungarbandh lake following recommendations may be help full.

1. Fisheries awareness programs in relation to environmental parameters should be organized by Government & local NGOs, which have to cover scientific fishing methods & aspects of conservation & protection of the water body.
2. Latest scientific methods should specially be practiced for promoting I.M.C. (Indian Major Carp) production.
3. To conserve the Indian major carps the use of nets less than 2 cm. mesh size should be strictly banned in this Lake.

4. State Government should involve researchers, students & villagers in the conservation of Lake Fisheries.
5. The further investigation on the population dynamics of these species from this water body becomes necessary.

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