Volume: 1 Issue: 3 Pages: 42-46

International Journal of Research in Academic World

E-ISSN: 2583-1615
Impact Factor: 3.133

Received: 08/October/2021 Int. J Res. Acad. World. 2021; 1(3):42-46 Accepted: 04/November/2021

Diversity of Fish Fauna in Silli-Ambadi Lake of District Bhandara (M.S.)

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Abstract

Study of Fish Fauna Carried out at. Silli-Ambadi Lake at.Silli. The area which is selected for the study occupy 7.90R hectare. It is situated at 9.8 km from Bhandara, and 1.2 km from Silli, it is situated near Silli. However local and popular name is "Silli-Ambadi Lake/Silli-Ambadi Talav" it is built on and impounds a local nallah, its gross storage capacity is 1.27 MCM & live storage capacity is 1.22 MCM, the Lake or dam constructed as part of irrigation project by government of Maharashtra. Hence, Silli-Ambadi Lake is selected as study area. The main objective of this study is to examine the physico-chemical of Silli-Ambadi Lake and to suggest to conserve method for drinking water and irrigation purposes.

Collection of Fishes: During study period fishes were collected during catching period with the help of fisherman. The fishermen were local. The fishing is done on large scale and then send to the nearby Fish Market for selling. Netting is being conducted by Gill netting and cast netting and they used Engine boat for catching fish.

Result: Physico-chemical characteristics of water sample were determined by using standard method. The observed physicochemical parameters were tabulated and analysed to understand the physicochemical characteristics of water. Simultaneously the fish fauna was also observed identified & efforts were made to understand the co-relation between them.

Keywords: Fish fauna, Silli-Ambadi lake, physico-chemical characteristics

Introduction

All life on this planet totally depends on the water which exists in nature in various form each as ocean, rivers, Lakes, clouds, rain and snow etc. no life can exist without water. As far as Lakes are concerned, they are the most fertile, diverse production and interactive ecosystem in the world the word "Lake" is used loosely to describe many types of water bodies natural, manmade and ephemeral including wetlands, Lakes are traditionally undervalued resources of human society. They provided a multiple of uses and prime regions for human settlement habitation uses include drinking and municipal water suply, industrial and cooling water supply, power generation, navigation, commercial and recreational Adholia (1992) [1].

Fisheries, body contact recreation, boating and other aesthetic recreational uses. Limnology is the study of the structural and functional interaction ships of organisms of include waters as their dynamic physical, chemical and biological environment affect them. The nature of distribution of flora found in a water body's mainly controlled by the function in physico-chemical characteristics of water. Water quality study provide the current information about the suitability of water for designated uses and to improve existing condition. Now a days most of the aquatic ecosystem receives, million litres of village, sewage, agricultural runoff. Its cause to nutrient enrichment cause to the eutrophication in aquatic ecosystem (Bandela 1998) [3] pollution of the aquatic environment by inorganic chemical is major factor to the survival of aquatic organism and including fish pollution.

The main object of this study is to examine the physico-chemical of Silli-Ambadi Lake and to suggest to conserve method for drinking water and irrigation purposes. Physical properties of aquatic ecosystem are determined by a combination of heat current, waves and seasonal distribution of environmental condition. The morphometry of body of water depend on the type of feature (Lake) and the structure of Earth surrounding the body of water.

Chemical Properties: chemical composition of water in a aquatic ecosystem is influenced by natural characteristics and processes including precaution, erosion, evaporation, sedimentation. All the bodies of water have certain composition of both organic and inorganic elements and compound. Chemical factor are essentially non-living components that affect the living organism of the fresh water community. When an ecosystem is barren and unoccupied new organisms. Colonising the environment rely on favourable environment conditions in the area to allow them to successfully live and reproduce Muley and Patil (2006) [17].

The periodical parameter change in physic-chemical parameter temperature transparency, dissolve oxygen chemical, oxygen demand, nitrate, phosphate etc. of water may provide valuable information on its quality affects on the productivity and biodiversity of reservoir.

Study Area

The Present Study of Fish Fauna Carried out at. Silli-Ambadi Lake at Silli from August 2019 to November, 2019. The area which is selected for the study occupy 7.90R hectare. It is situated at 9.8 km from Bhandara, and 1.2 km from Silli, it is

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situated near Silli. However local and popular name is “Silli-Ambadi Lake/Silli-Ambadi Talav” it is built on and impounds a local nallah, its gross storage capacity is 1.27 MCM & live storage capacity is 1.22 MCM, the Lake or dam constructed as part of irrigation project by government of Maharashtra. Hence, Silli-Ambadi Lake is selected as study area.

For achieving any sustainable success in the protection of Silli-Ambadi Lake, awareness among the general public education and corporate institutions must be created in Bhandara district mainly. The policy makers at various levels along with site managers need to be educated. The bilateral co-operation in the resource management needs to be enhanced.

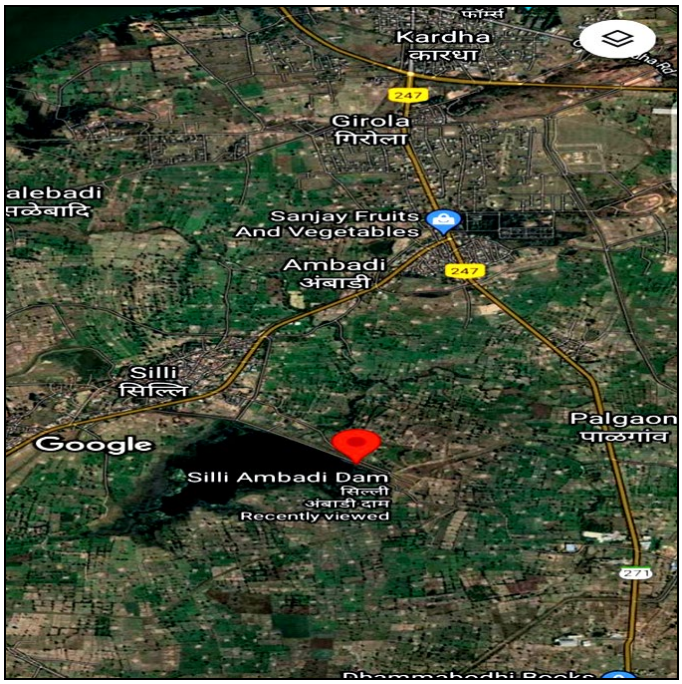

Fig 1: Satellite view of Silli Ambadi Lake

Fig 2: View of Silli Ambadi Lake

Review of Literature

Among the surface water body lake and reservoirs are considered to be most valuable water resources. These water bodies are currently under serious pollution threat not only in India, but also globally considered to be an important issue. Over past couple of decades national and international program on lake water quality assessment and their management in the perspective of conservation were attempted. In most of the lake water is highly polluted with agrochemicals, fertilizers, organic wastes and industrial discharges. Most of the limnological study of the lake system revealed the fact that may lake slowly transformed into swampy marsh without any proper management for study of fish.

Very recently there is a National Lake Conservation Policy adapted by the Ministry of environment and forest, government of India. Without knowledge of limnology it is difficult to understand the biological phenomenon fully, because the limnology reveals much about the metabolism of ecosystem and explains general hydro biological interrelationships.

Limnology, as a distinct field of science has developed during the last 100 year or so Beginnings of Knowledge Concerning fresh water life, like those of marine life were made in the remote pas possible before the days of Aristotle (384-322 B.C.). However, besides the historical interest involved, no significant scientific contributions of a strictly scientific nature were made for at last nineteen hundred year after the time of Aristotle (welch 1952).

Smaller bodies of water such as tanks and ponds have attracted greater attention because of their easy accessibility and the possibility to do intensive studies without costly equipment such as motorized boats, vehicles etc., Thus in the North and N.E. parts of India a large number of contributions are available on tanks and ponds such as those of Das, Sehgal (1960, 1967), Upadhayay (1960).

The lake, pond or a tank proves to be an excellent type for beginning the study of ecosystem. This handy biome on the one hand proves to be a good material for study of functional aspects of the ecosystem, and on the other hand it gives the idea of deterioration by the human activities.

Therefore, the world water resources have been the subject of great concern in the various national and international debates, programmers and conferences because they are indispensable to life in various ways. These data have really been helpful in managing a few aquatic ecosystems in temperate countries.

Different workers like Beadle (1934), Coulter (1963), John et. al. (1977) [11] etc. have made important contributions on tropical waters of Africa. On account of the differences in the climatic and geological condition it would not be correct to apply the inferences drawn from such studies of temperate or African tropical waters to the conditions prevailing in India.

Many workers of limnology such as Muley, Patil (2006) [17], Yeole (2005) [29], Jesudas (1995) [10], Lohar (1998) [15], Bandela (1998) [3], Adholia (1992) [1] have made important contributions on account of variable fishery status with relation to physio-chemical characteristics of India. The present work is a part of a continuing programme of intensive study of important aquatic ecosystem of Bhandara District.

The survey of literature reveals that most of the works on this aspect in the District Bhandara merely confined themselves to present the fish list growing in aquatic habitats Systematic studies on the productivity, energetics and chemical constituents of macrophytic species are still very scanty and there yet remains a lot of scope of pursuing such studies.

Material and Method

Regular sampling of water was made from the different regions of this pond. The physico-chemical parameters like pH, temperature, and dissolved oxygen were recorded. The pH was recorded with the help of Universal pH paper at the time of sampling. The temperature of the water was recorded with the help of standard

centigrade thermometer in degree Celsius. Separate sample were collected for DO in 250ml Do bottles & oxygen was fixed by adding alkali iodide for further analysis. The samples were analysed by Winkler's method with azide modification.

Collection of Fishes

During study period fishes were collected during catching period with the help of fisherman. The fishermen were local. The fishing is done on large scale and then send to the nearby Fish Market for selling. Netting is being conducted by Gill netting and cast netting and they used Engine boat for catching fish. Fish catching was not done during July to September because the seeds of fish and prawns were stocked. After catching the fish were brought to the shores in society house and segregated species wise and calculated the total catch of fish and send to the market. Identification was done by using standard literature of Day (1958), Talwar and Jhingran (1991), Srivastva (1985), S.K. Gupta and P.C. Gupta (1905), General and Applied Ichthyology (Fish and Fisheries), Jhingran (1975).

Collection of Macrophytes

Macrophytes were collected during winter season. The survey was conducted to collect the information regarding littoral and submerged vegetation. The macrophytes were collected by hand picking from littoral zone and exposed marginal areas of Tank near to sampling sites and then brought to laboratory immediately, preserved in 10% formalin and observed

Physico-Chemical Analysis of Water Sample: Physico-chemical characteristics of water sample were determined as described in the standard method.

i). **Temperature:** Monthly were temperature was taken with the help of thermometer.

ii). **PH:** The pH was determined with help of universal pH paper.

iii). **Dissolved Oxygen:** Dissolved oxygen in water sample was detected by wrinkler's method with alkaline, iodine, acid solution modification.

iv). **CO_2-Corbondioxide:** Free carbon dioxide was eliminated by titrating the water sample against N/44 NaOH solution with phenolphthalein as an indicator.

For determination to free CO_2 water was taken from two sides of lakes and then titrating it against. N/44 NaOH, free CO_2 was calculated by the following formulae.\

Formula

$$CO_2 \text{ Mg/litre} = \frac{\text{Ml of titrate} * 100 \text{ ml}}{\text{Ml of sample}}$$

Table 1: Total number of fishes found in Silli–Ambadi Lake.

Sr. No.	Fish	Species	Family	Local Name
1.	*Catla*	Catla	Cyprinidae	Catla
2.	*Labeo*	Rohita	Cyprinidae	Rohu
3.	*C. mrigala*	Mrigala	Cyprinidae	White Carp
4.	*Wallago*	Attu	Siluridae	Lachi
5.	*Xenentodon*	Cancila	Belonidae	Garfish Kakila
6.	*Clarias*	Batrachus	clariidae	Magur
7.	*Tilapia*		Teleostei	Tilapia
8.	*Ophiocephalus*	Striata	Teleostei	Murrel

Results and Discussion

The observed physicochemical parameters were tabulated and analysed to understand the physicochemical characteristics of water. Simultaneously the fish fauna was also observed identified & efforts were made to understand the co-relation between them. The limnological study of various physicochemical parameter indicate that the lake exhibit substantial variation in its biotic and abiotic characteristics. They are determinant of the quality of water. The variation of physic-chemical parameters of water during (March) 2022.

1. **Atmospheric Temperature:** Temperature and photoperiod are important factors which control the behaviour, physiology and distribution of organisms. During the present study the atmospheric temperature ranged from 30 to 32 degree Celsius during the year 2022. Rise in temperature speed up the biochemical reaction and reduce the solubility of gases. The atmospheric temperature was always found higher than the water temperature.
2. **Water Temperature:** The water temperature ranged between 25 to 30 degree Celsius. It was recorded minimum during winter and maximum in summer. The monthly variations showed that the water temperature followed the seasonal pattern and fluctuated according to the prevailing atmospheric temperature.
3. **PH:** pH in the present study was recorded between 8.5 to 9. The maximum pH was recorded in summer season. Increase of algal blooms and aquatic flora of lake offers the tremendous photosynthetic activities in the water. This maximum pH is because of high photosynthetic activities. (Saware and Puranik 1988).
4. **Colour:** the colour of water of silli-ambadi lake ranged from light brown to deep green during different season of the year depending on abundance of phytoplankton.
5. **Conductivity:** After the analysis the result show that conductivity of ground water of these areas depend on location as well as months also and it also show thet at Karma the conductivity is higher than any other area. (Upadhyay 1987) [27].
6. **Alkalinity:** In the present study total alkalinity ranged between3.58 ± 23.4 ppm. That is also within permissible limits suggested by WHO (984). (Yeole and Patil 2005) [29]
7. **Total Hardness:** Total hardness which is very important parameter determining usefulness of water in different sectors is also very much below the permissible limit that is 102 to 210 might. This denotes that water is soft and good for drinking purpose.
8. **D.O.:** The D.O. is one of the MOS important factor in any aquatic ecosystem. The main source of D.O. is from dissolution from atmosphere and the photosynthesis. The D.O. was maximum in summer and minimum in winter season. (Meshram 2003) [16].

Eight species of fishes have been recorded and identified in present study in silli-ambadi lake. Fish species like Catla-catla, Labeo rohita, Cirrhinus mrigla, Wallago attu, Xenentodon. Fishes from the family cyprinidae dominates the other variety of fish species.

Conclusion

In the present study various physic-chemical and Biotic component of the Silli-Ambadi reservoir were investigated. During the investigation Silli-Ambadi lake water showed large number of fish species.

In any aquatic ecosystem limnological characteristics can affect both Fauna & Flora. Biodiversity contribute both directly & indirectly to human such as food for good health, security, social relationship, life & freedom for choice etc. In last decade people interfere with ecosystem & over exploitation of natural resources its result that biodiversity depletion, but the losses in biodiversity and change in ecosystem survive have adversely affected the Well-being.

Survival and growth of fishes in the Silli-Ambadi lake is depend totally upon its physico-chemical parameters. Physico-chemical parameters like water, temperature, pH, D.O., were found always under the limit, while turbidity, B.O.D and COD found mostly suitable for fish survival and good reproduction rate, thus physico-chemical quality of the Silli-Ambadi lake water in study area was fit for fish diversity, growth reproduction and fish cultivation during study period. To improve water quality of the lake stop pollution creating activities like throwing of solid wastes and garbage of industrial effluents of dead bodies in nearly area & agriculture runoff.

The present study is relevant to limnological study, biodiversity of plankton and fishes (species) in lake Silli-Ambadi. This study explains that lake is in rich biodiversity of plankton, fishes and need to conservation for future.

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