

STUDY OF PHYTOPLANKTON DIVERSITY OF LOWER TERNA RESERVOIR, DISTRICT OSMANABAD, M. S. INDIA

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Abstract: Phytoplanktons are producer of aquatic ecosystem. They are important food source of fishes and also maintain the biotic and abiotic balance of aquatic ecosystem. Lower Terna reservoir is the main water source of district Latur and Osmanabad. So the study of reservoirs in related to phytoplankton is more important, because most of the population are depends on this reservoir for irrigation as well as fisheries. In the present study we investigate occurrence of phytoplankton, as well as seasonal change in diversity of phytoplankton. The data was collected during June 2015 to May 2016. The phytoplankton is identified in four classes viz, Chlorophyceae, Bacillariophyceae, Myxophyceae and Euglenophyceae.

Index Terms - Phytoplankton Diversity, Lower Terna reservoir, District Osmanabad.

I. Introduction

Water is important factor of all living organism. On earth the fresh water resources are in the form of river, reservoirs, pond, lakes etc. in India most of the people are depends on River, reservoirs. In Maharashtra, district Osmanabad is dry area as compare to rest of Maharashtra; so most of the people are depends on reservoirs as a water resource. These Reservoirs are store the water and supplies water to irrigation, for generating electricity, farms as well as drinking and Domestic Purposes.

In this current study we have taken Lower Terna Reservoir in to consideration, which located at the latitude of 18°2'56"N and at the longitude of 76°23'31"E. It has capacity of 18630 km³ covering surface area of 380km². It is located near village Makani district Osmanabad, at the River of Terna which is part of Godavari Basin.

Not only villages around reservoirs are getting water from the reservoir but also 52 earth quake affected villages and cities like Ausa, nilanga, Omerga are getting benefits of same. It also supplies the water to Industries like sugar mills situated at Killari, khed and Samudral. So it will worth to say Terna reservoir is lifeline of Osmanabad and Latur district as during study that is during 2015-16, same districts are survived from drought with the help of water of this reservoir. Phytoplankton is main biological characteristic in aquatic system like reservoir which includes algae (blue, green), diatoms, euglenoids etc.

The productivity of a water reservoir is correlated with the density of plankton. Similarly zooplanktons are at secondary level, and transforms food energy synthesized by the phytoplankton to higher level of food chain. These planktons are sensitive to environmental variations so they show high diversity with seasonal fluctuation. (Dr. AmbiliNath, Neethu R.V., Revathy J.S., 2015). The plankton population in maintain health and quality of water reservoirs (Prasad and Singh, 1958). The phytoplankton serves as a food for development and growth of zooplankton (Hutchinson, 1967). The phytoplankton population of Lower Terna reservoir includes, Myxophyceae, Chlorophyceae, Bacillariophyceae, Euglenophyceae. Present investigation was carried on by collecting water samples from reservoir from four different stations in airtight and opaque plastic containers. The phytoplanktons are collected from the reservoir separately.

Phytoplankton are kept in sedimentation columns after adding 4% formalin solution. The drop count method (Welch, 1952) is used for quantitative and qualitative analysis of phytoplankton and identifications of them were made by standard methods (Adoni, 1985, Philipose, 1959, and Prescott, 1970).

II. Result and Discussion

The main hypothesis of the given paper is to study of the phytoplankton diversity of lower Terna reservoir and the study of Physico-chemical and biological properties of given reservoir. The richness of phytoplankton are depends upon temperature (Sukunon, 1980), environmental condition is the main factors for the production of phytoplankton. The study of phytoplankton is advice the process of water pollution and effect of pollution on reservoirs. The variation of species diversity and richness are depends on the Physico-chemical parameters of water (yeragl et al, 2003).

The worldwide studies on phytoplankton are undertaken by researchers such as, Hutchinson Allen G.P. (1998), Basu B K (1996), Berthon J L (1996), De Domitronic Y Z(2007), Odum (1971), Mursalln(2008), Sharma et al (2011), Sarwade and Kamble (2014).

The fluctuation of physicochemical factors effects on the metabolic activities of the organism it plays an important role in qualitative distribution of phytoplankton of different seasons. (Joshi et al, 1987), Ramanibai and Ranichandran, (1987): Sharma and, Ramanibai and Ranichandran, (1987): Sharma and Renu Sharma (1992).

The results of the present study are summarized in Table:1. The all four station on reservoir shows 23 different species of in different classes are Chlorophyceae, Bacillariophyceae, Euglenophyceae, Myxophyceae. The Chlorophyceae are represented by 9 different species, Bacillariophyceae by about 6 different species, Myxophyceae by about 5 different species in Terna reservoir. The present of euglena in Terna reservoirs indicate that enrichment of organic material and pollution of Terna reservoir. The environmental factors, the nutrients and other organic and inorganic substances in the water affects on algal growth. The density of phytoplankton is abundant in summer seasons because it is suitable for algal growth. Temperature is most important parameter for abundance growth of phytoplankton, it is very important for ecological pyramid for aquatic life.

Table.1- Diversity of Phytoplankton at Lower Terna Reservoir—

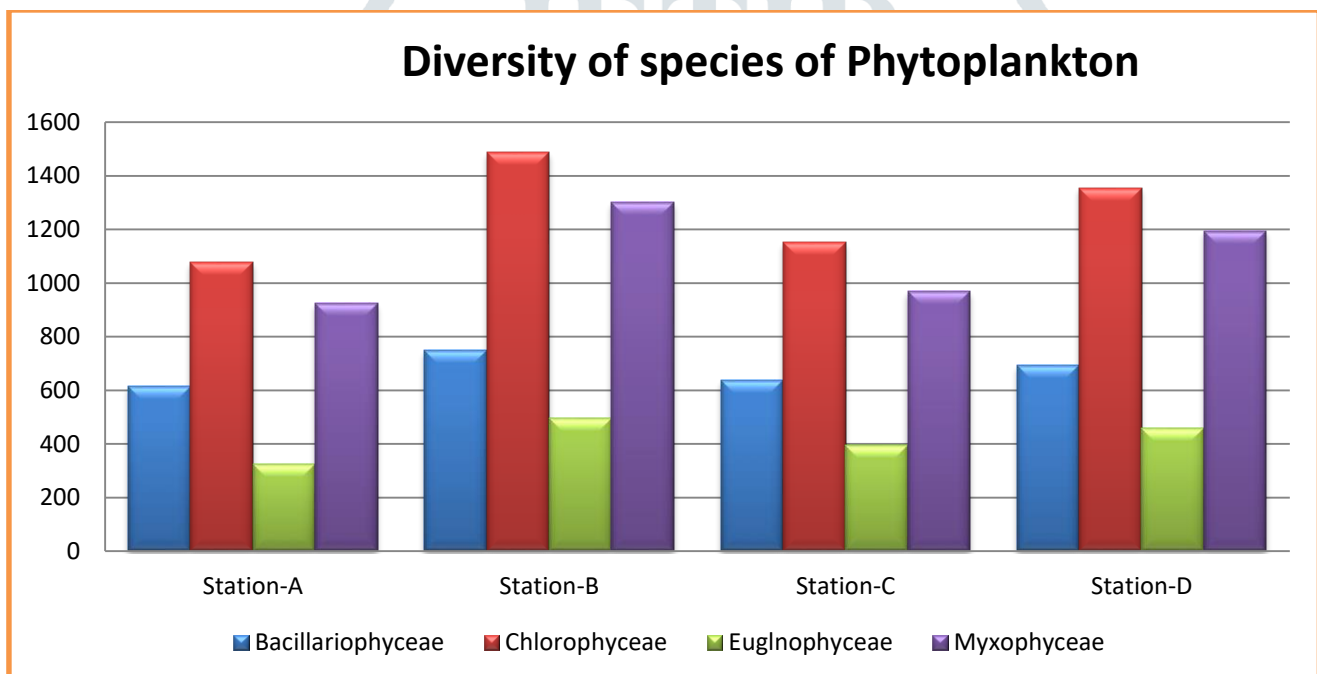
Station	Station-A	Station-B	Station-C	Station-D
Phytoplankton	2941	4031	3149	3701
Bacillariophyceae	615	748	636	693
Cyclotella sp.	109	125	90	113
Cymbella sp.	79	88	86	97
Diatoma sp.	165	163	176	149
Gyrosigma sp.	77	113	81	98
Navicula sp.	63	150	72	137
Synedra sp.	122	109	131	99
Chlorophyceae	1077	1487	1151	1355
Ankistrodesmus sp.	87	118	93	80
Chlorella sp.	201	278	208	264
Coelastrum sp.	44	93	49	103
Pediastrum sp.	182	267	187	242
Scendesmus sp.	107	168	120	150
Spirogyra sp.	237	184	244	165
Tetrahedron sp.	20	113	30	108
Ulothrix sp.	94	138	109	127
Volvox sp.	105	128	111	116
Euglenophyceae	325	496	393	459
Euglenoacus	124	157	132	144
EuglenoCherenbergii	104	167	115	148
Eugleno spirogyra	97	172	146	167
Myxophyceae	924	1300	969	1194
Anabena sp.	207	300	215	265
Merismopedielgans	158	225	172	208
Mycrocystiselgans	215	250	222	230
Mycrocystisweseberg	191	262	203	247

Nostoc sp.	153	263	157	244
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Population of Phytoplankton in the working area are in order of Dominancy among the species with regards to number as follows Chlorophyceae>Myxophyceae>Bacillariophyceae>Euglenophyceae. Distribution of phytoplankton abundance varies with different stations as per table 2 and figure 2.

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Figure.1 – Station wise diversity of species of phytoplankton



The study of phytoplankton is very useful for the checking of water quality of any reservoir and nature of the reservoirs (Manawar, 1970), and Pawar et al (2006). The temperature is the main factor for the growth of phytoplankton (pandey et al, 1993).

It is concluded that the fluctuation in species diversity of phytoplankton are depends upon variation in physico-chemical factors. Species diversity is the important indicators for effective tools in environment monitoring. In four sites of Terna reservoirs, species belongs to Chlorophyceae, Bacillariophyceae, Myxophyceae and Euglenophyceae as a phytoplankton forms.

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