

# Studies on Phytoplankton Diversity in Devarjan Reservoir, Udgir (Maharashtra)

Nagpurne Vinay S. <sup>1</sup>, Allapure R. B. <sup>2</sup>

<sup>1,2</sup> Dept. of Botany, Maharashtra Udayagiri Mahavidyalaya, Udgir.

Dist. Latur (M.S.) India

Corresponding Author: Dr. V. S. Nagpurne

Mail: [vinaynagpurne@gmail.com](mailto:vinaynagpurne@gmail.com)

## Abstract

In the present research paper the phytoplankton diversity of Devarjan dam was studied. This is medium sized dam is situated 18.33<sup>0</sup>N latitude and 76.99<sup>0</sup>E longitudes, which is 17 km away from Udgir (Maharashtra).

The water samples were collected during June 2019 to May 2020 from four selected sampling stations for quantitative and qualitative estimation of phytoplankton. The present investigation results were found that among the three group of phytoplankton, Chlorophyceae 43.28% was dominant group followed by Cyanophyceae 32.07% and Bacillariophyceae 24.63%. These results indicate the abundance of phytoplanktons and high level of primary energy which is subjected to sustainably development of reservoir utility. The phytoplankton population in any aquatic system is biological wealth of water for fishes and constitutes a vital link in the food chain.

**Key words:** Water, Quantitative estimation, Phytoplankton, Devarjan reservoir, Udgir.

## Introduction:

The Devarjan dam is medium sized earth fill dam on Devri river near Udgir dist. Latur (Maharashtra). It is used for domestic, irrigation and fisheries purposes. Phytoplankton has long been used as indicator of water quality. Phytoplankton responds quickly to environmental changes and hence their standing crops and species composition are more likely to indicate the quality of water mass in which they are found. The measurement of plankton productivity helps to understand conservation ratio at various tropic level and resources as an essential input for proper management of reservoirs. These notable studies on phytoplankton and zooplankton diversity have been made by Rao and Choubey 1990, Ariyadej et. al. 2004, Mishra et.al. 2010, Joseph and Yamakanmard, 2011. The management of water body for its healthiness and fish production require a thorough understanding of its tropic structure their population characteristics and the nature nutrient cycling which helps

to optimum fish production this study also investigated by Deoravi, 1993. Phytoplankton is the major primary producers it is an important link in energy flow, Sharma 1980.

Phytoplanktons respond quickly to environmental factor and they strongly influence non – biological aspects of water quality like pH, temperature, dissolved oxygen and chlorides.

Study of phytoplanktons is very useful for assessment of biotic potential and contributes to over all estimation of basic nature and general economic potential of water body. According Pawar et. al. 2006. The water quality of parameter monthly changes in the abundance and biomass of phytoplankton's and zooplanktons, Goswami and Malkodi, 2012, given an account on zooplankton on fresh water reservoir Nyari-II Rajkot, Gujrat (India). Ahmad et. al., 2013 studies diversity and seasonal fluctuation of phytoplankton of Pahuj reservoir, Jhansi (UP) and seasonal distribution of phytoplankton in Raiwada Reservoir, Visakhapatnam, Andhra Pradesh ( India) described by Kaparapa and Geddada. 2013.

The Present study was carried out in the Devarjan dam aimed to investigate the phytoplankton diversity, nutritional status and also producing a good yield of fish and it is also good source of water supply.

## **Material and Method:**

### **Study area:**

The present investigation has been done to study seasonal variation of phytoplankton in three seasons i.e. monsoon, winter and summer. The Devarjan dam is situated near Udgir about 17 km away in Latur dist. It is constructed by Government of Maharashtra under major irrigation project in 1993 on Devri river. The reservoir water is spread over 10.67 sq.km. The water is used for irrigation, fisheries purpose and domestic use. Devarjan dam is an ecosystem contains diversity of plankton and fishes. phytoplanktons are used as a food for large number of zooplankton including fishes. The phytoplankton samples were collected during the June 2019 to May 2020 from preselected four sampling station, which are described as sampling station ( S1), It is located at the dam of Devarjan reservoir, Sampling station (S2) it is located at near the village of Gangapur, sampling station (S3) it is located at another side of village of Devarjan and sampling station (S4) it is located at end of Devarjan reservoir near Bhakaskheda village.

### **Phytoplankton Sampling:**

The phytoplankton water samples were collected over the period of one year. The samples were collected with the help of plankton net. Samples were taken into 200 ml bottle and preserved in 2ml of Lugol's solution and 2 ml of 4% of formalin solution. For identification of phytoplankton in different class of different genera was carried out under research microscope with help of standard keys, APHA, 1995.

## Result and Discussion:

Phytoplankton is considered as primary producer and is one of the most important food items of the fishes and many other aquatic organisms. The phytoplanktons were mainly represented by algal qualitative composition and seasonal variation of algae was observed (table1). The present study only three groups of algae were reported from Devarjan dam of Devarjan Tq. Udgir Dist. Latur, viz. Chlorophyceae, Bacillariophyceae, Cyanophyceae. The Chlorophyceae was the dominant group containing 43.28% of phytoplankton. It was minimum during the monsoon season and maximum during the month of February and March i.e. summer season. This investigation also recorded by Kaparapa and Geddada (2013), that recorded 39.84% contribution of Chlorophyceae group in Riwada Reservoir, Vishakhapatnam (Andhra Pradesh). Cyanophyceae was the second dominant group contributed 32.07% of phytoplankton population. It was observed minimum during monsoon season and maximum during summer season. Similar study was observed by Ingole et. al. (2010) in Majalgaon dam in Maharashtra. Bacillariophyceae was observed least contribution 24.63% among the phytoplankton. It was maximum during summer and minimum during monsoon season. This result also found by Ahmad et.al. (2013) which recorded 29% of Bacillariophyceae among the phytoplankton Pahuj Reservoir Jhansi (UP).

The seasonal variation of phytoplankton depends upon many other environmental factors. The nutrients and other organic and inorganic substances in water. The water quality parameters have a direct influence upon variation and ecology of phytoplankton. The maximum (%) percentage of phytoplanktons was found in summer season. This result were found due to water quality and other parameters like high value of alkalinity, hardness, chlorides, nitrates, phosphate, total dissolved solids, pH and transparency. The increases in concentration of phosphate and nitrates have important effect on phytoplankton community. The temperature and sunshine hours also high during summer season.

Phytoplankton communities exhibit a major biotic component of an aquatic ecosystem. It has been given to identify various plankton species, as indicates of particular type of water pollution. The most important effect of organic pollution in water body is due to enrichment of nutrients and total number of algal species.

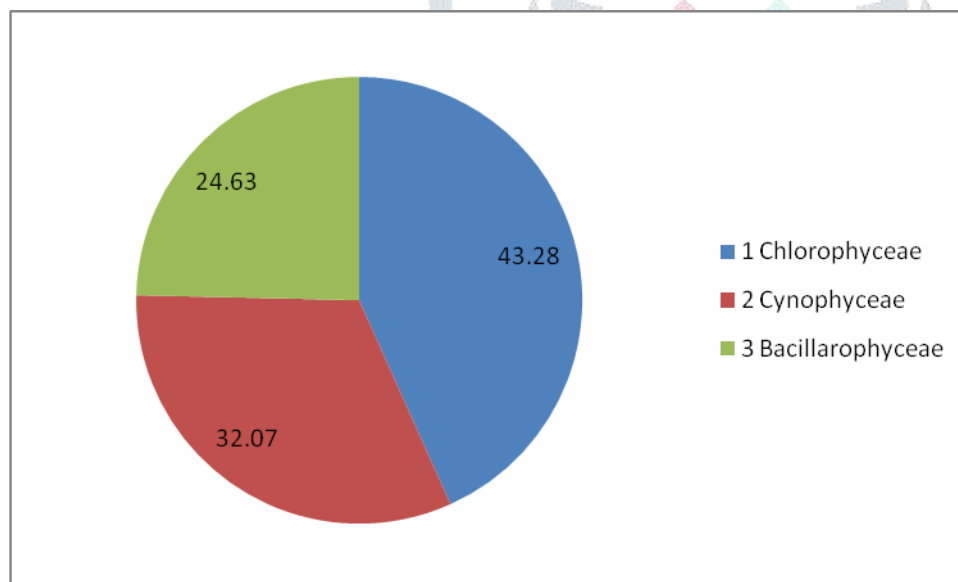
Phytoplankton is the most important component of aquatic ecosystems. The present investigation found that nutrient status of Devarjan reservoir is high with good primary energy level and subjected to sustainable development and better utilize for fish production.

**Table- 01:**

Seasonal variation in phytoplankton during the year of 2019 to 2020 in Devarjan dam, Udgir at four sites (S1, S2, S3 & S4).

Sr No.	Phytoplankton	Manson	Winter	Summer	Total	Average percentage (%)
1.	Chlorophyceae	524	920	1750	3194	43.28
2.	Cynophyceae	402	715	1250	2367	32.07
3.	Bacillarophyceae	219	530	1059	1818	24.63

**Fig. 1:** Average percentage in phytoplankton diversity during the year of 2019 to 2020 in Devarjan dam, Udgir



### Refrences:-

1. Ahmad V., Hussain G., Tharani M. and Hussain A. 2013. Diversity and seasonal fluctuation of Phytoplankton of Pahuj reservoir, Jhansi (UP), International Journal of Pharmaceutical and Biological Archives 4(1) : 66-69.

2. APHA- AWWA- WPCE, 1995. "Standard method for examination of water and waste water" 19<sup>th</sup> edition, American Public Health Association, Washington DC.
3. Ariyadej C, Tansakul R, Tansakul P, Angsupanich and Saowapa, 2004. "Phytoplankton Diversity and its relationship to the Physico- chemical Environment in the Banglang Reservoir" Yala Province, Song Klanakar J. Sci. Technol, Vol. 26.No. 5 Pp. 595-607.
4. Deorari B.P. 1993. Studies on productive potential of a Manmade Reservoir of Tarai fisheries research, 23 July 1987 in Banglang Reservoir (CIFE, Bombay).
5. Goswami A.P. and Mankodi P. C., 2012. Studies on Zooplankton of fresh water reservoir Nayari-II, Rajkot district, Gujarat, India, ISCA, Journal and Biological sciences 1(1): 30-34.
6. Ingole S. B., Nail S. R. and Kadam G. A., 2010. Study of phytoplankton of fresh water reservoir at Majalgaon on Sindphana river district Beed (M.S.), International Research Journal, 1(13): 87-88.
7. Joshep and Yamakanamardi M. S., 2011. Monthly changes in the abundance and biomass of zooplankton and water quality parameter in Kukkara halli Lake of mysore". J. Environ. Bio. India, Vol. 32. Pp. 551-557.
8. Kaparapu J. and Geddada M. N. R., 2013. Seasonal distribution of Phytoplankton in Riwada Reservoir, Visakhapatnam, Andhra Pradesh, India. Notulae Science Biologicae 5(3):290295.
9. Mishra B.B., Chaturvedi G. B. and Tewari D.D., 2010. "Phytoplankton fluctuations under the stress of Abiotic factors at Koshargaddi Dam, Balrampur" J. Exp. Sci. Vol. 1 No. 5, Pp. 22-24.
10. Pawar S. K., Pulle J. S. and Shendage K. M., 2006. "The study on Phytoplankton of Pethwadaj Dam" Ta. Kandhar, Dist. Nanded, Maharashtra. Aqua, Boil, Vol. 21, No. 1. p. 1-6.
11. Rao K. S. and Choubey U. 1990. "Studies on phytoplankton dynamics and productivity fluctuation in : Gandhi Sagar Reservoir". National workshop on reservoir, fisheries, special publication, A.F.S.I. Branc. Vol. 3.
12. Sharma A. P. 1980. Phytoplankton primary production and nutrient relation in Nainital lake. Ph.D. Thesis, Kumaun University, Nainital. 317.