

Study of Algal Diversity in the Waldevi dam near Nashik (M.S.), India

V.A. Ghatule, B.W. Chavre and H.K. Bhagwan*

Department of Zoology,
S. M. Dnyandeo Mohekar Mahavidyalaya, Kalamb, Dist Osmanabad (M.S.), India

*Department of Botany,
Arts Commerce & Science College, Nandgaon, Dist Nashik (M.S.), India
E.mail- varshachavre@gmail.com

Abstract

Waldevi is an earth fill dam constructed in 1995 on Waldevi River near Pimplad village of Nashik tehsil, about 10 km away from the city. The total capacity of storage is 33,720.00 km³ (8,089.86 cu mi) and 3,437 km² (1,327 sq mi) surface area. A study was made in the year 2016 on the diversity of the algae present in the dam water. An attempt was made to study the seasonal variation of algal diversity. Algae have been collected every month by using standard size plankton net and were identified with the help of literature. In the present study various algal species of Chlorophyceae, Cyanophyceae, and Bacillariophyceae were identified. The members of chlorophyceae were found dominant over other groups. It was observed that with the changing environmental conditions diversity and abundance of the different types of algal flora is influenced.

In the recent past, researchers from various parts of the world concentrated on the study of phytoplanktons because, they are very valuable and important component of the aquatic vegetation⁵ as their presence or absence in the water affects different parameters of water and zooplanktons. Phytoplankton has ability to converts solar radiant energy into biological energy through the process of photosynthesis as primary production. It plays an important role in conditioning the microclimate, helps in regulating the atmospheric level of O₂ and CO₂, vital gases for life. Phytoplankton

plays an important role as food for herbivorous animals¹⁰.

Phytoplankton is an important component of ecosystem, which responds to ecosystem fluctuations rather rapidly. Plankton occurs in all natural water as well as in artificial impoundments like ponds, tanks, reservoirs, irrigation cannels and rivers. The plankton study is a very useful tool for the assessment of water quality in any type of water body².

Many workers including Kamath *et.al.*¹,

Nath *et.al.*⁴, Sarwade & Kambale⁸, Sankaran and Thiruneelagandan⁷, Sakdeo⁶, Mahadik & Jadhav³, Narwade *et.al.*, Kamble *et. al.*,² and many others made attempts to study phytoplankton diversity of different water bodies.

Waldevi is an earth fill dam constructed in 1995 on Waldevi river near Pimplad village of Nashik tehsil, about 10 km away from city. The total capacity of storage is 33,720.00 km³ (8,089.86 cu mi) and 3,437 km² (1,327 sq mi) surface area. The height of the dam above its lowest foundation is 36.4 m (119 ft) while the length is 1,890 m (6,200 ft). The bottom of reservoir is rocky. This too posses water throughout the year. Water of both reservoirs is formerly used for irrigation but also for washing, bathing and pisciculture activities. The reservoirs store rain water received from adjoining catchment area and is influenced by some anthropogenic activities.

In the present paper authors mad an attempt to study seasonal variations of diversity and abundance of different microalgae present in the Waldevi dam water throughout the year, 2016.

Waldevi is an earth fill dam constructed on Waldevi River nearby Nashik. Many villages surrounding the dam are provided with water supply for the purpose of drinking, domestic use, agriculture etc. A study was undertaken during the month January 2016 to December 2016 to find out the diversity and abundance of algal species present in the water. The water samples were collected randomly once in a month. Collection bottles prior to collection were washed with acid was

used for the purpose. Algal samples were collected from floating, submerged and attached forms. The water samples were collected by using standard plankton net and sometimes by containers. The water samples are immediately fixed with 4 % formalin solution. By bringing samples in to laboratory, it was observed under microscope. Identification of observed phytoplanktons was done by using standard books and internet resources.

List of Algae observed during the study period

Sr. No.	Algal member	Class
1	<i>Anabaena</i> sp.	Cyanaophyceae
2	<i>Anacystis</i> sp.	Cyanaophyceae
3	<i>Asphaerica</i> sp.	Cyanaophyceae
4	<i>Bacillaria</i> sp.	Bacillariophyceae
5	<i>Botryococcus</i>	Cyanaophyceae
6	<i>Chlamydomonas</i> sp.	Chlorophyceae
7	<i>Chlorella</i> sp.	Chlorophyceae
8	<i>Chroococcus</i> sp.	Cyanaophyceae
9	<i>Cladophora</i> sp.	Chlorophyceae
10	<i>Cosmarium</i> sp.	Chlorophyceae
11	<i>Cyclotella</i> sp.	Bacillariophyceae
12	<i>Diatoma</i> sp.	Bacillariophyceae
13	<i>Euglena</i> sp.	Chlorophyceae
14	<i>Fradilaria</i> sp.	Bacillariophyceae
15	<i>Fragalaria</i> sp.	Bacillariophyceae
16	<i>Geotrichum</i> sp.	Cyanaophyceae
17	<i>Gomphonema</i> sp.	Bacillariophyceae
18	<i>Microcystis</i> sp.	Cyanaophyceae
19	<i>Microspora</i> sp.	Chlorophyceae
20	<i>Navicula</i> sp.	Bacillariophyceae
21	<i>Nitzchia</i> sp.	Bacillariophyceae
22	<i>Ocellatoria</i> sp.	Cyanaophyceae
23	<i>Oedogonium</i> sp.	Chlorophyceae

24	<i>Pediastrum</i> sp.	Chlorophyceae
25	<i>Phromidium</i> sp.	Cyanaophyceae
26	<i>Pinnularia</i> sp.	Bacillariophyceae
27	<i>Pithophora</i> sp.	Chlorophyceae
28	<i>Plectonema</i> sp.	Cyanaophyceae
29	<i>Rivularia</i> sp.	Cyanaophyceae
30	<i>Scenedesmus</i> sp.	Chlorophyceae
31	<i>Spirogyra</i> sp.	Chlorophyceae
32	<i>Spirulina</i> sp.	Cyanaophyceae
33	<i>Tabellaria</i> sp.	Bacillariophyceae
34	<i>Tetrahedron</i> sp.	Chlorophyceae
35	<i>Ulothrix</i> sp.	Chlorophyceae
36	<i>Volvox</i> sp.	Chlorophyceae
37	<i>Zygnema</i> sp.	Chlorophyceae

In the present study authors gone through the intensive and extensive study of different algal genera present in the Waldevi dam which is constructed on the river Waldevi near the village Pimplad nearby Nashik city. The collection of algal specimens was done after every month in the year 2016. Total 37 algal genera were recorded from the water of dam. Out of which 12 genera belongs to class Cyanophyceae (Blue green) algae, Class Bacillariophyceae represents total 10 genera and 15 algal genera were recorded of class Chlorophyceae. Algal collection were made from different sites of the dam including back water, front side of the dam, sites with more anthropogenic activities and sites with less anthropogenic activities. It was observed that the occurrence of various algal groups in the dam water was greatly affected by the changing environmental conditions.

Author is grateful to Dr. Babasaheb

Ambedkar Marathwada University for providing financial assistance through fellowship. Author is also thankful to Dr. A. D. Mohekar, Principal, S.M. Dnyandeo Mohekar College, Kalamb, for providing all required help and facilities.

References :

1. Kamath, D., Vijaya K., B.R. Kiran, S. Tirumala and E.T. Puttaiah, (2006). *J. Aquatic Biology*, 21(1): 7-9.
2. Kamble S. M., H. K. Bhagwan and B. Y. Patil, (2013). *Trends in Life Sciences* 2(2): 21-24.
3. Mahadik B.B and M.J. Jadhav, (2014). India, *Bioscience Discovery*, 5(1):123-125.
4. Nath A., R.V. Neethu and J. S. Revathy, (2015). *IJRSET*, 4 (9), 9189 -9193.
5. Pandey P., P.K. Sahu, Y.N. Jha and A.K. Shrivastava, (2014). *Open Journal of Marine Science*, 4 : 43-50.
6. Sakdeo B.M. (2013), *Global J. Biosci. & Biotech*, 2 (2): 227-229.
7. Sankaran B. and E. Thiruneelagandan, (2015). *Int. J. Curr. Microbiol. App. Sci*, 4(4): 168-173.
8. Sarwade A.B. and N.A. Kambale, (2014). *JENE*, 6 (4): 174-181.
9. Sharma O.P., (2007). Textbook of Algae, Tata McGraw- Hill Publishing Company Ltd, New Delhi.
10. Shinde S.E., T. S. Pathan and D.L. Sonawane, (2012). *J. Environ. Biol.* 33: 643-647.