



## Study of algal diversity from different groups of fresh water bodies of Nandurbar district

RR More

Department of Botany, Jijamata A. S. C. College, Nandurbar, Maharashtra, India

### Abstract

The current work is based on the diversity of fresh water algae which was done by water sample collections from local location of Tapi river of Nandurbar District. The standard protocols were followed for the procedure of collection, preservation and identification of algal flora with the help of suitable monographs and literature has been done. It was found that four major class that's includes 12 order and 16 family members are found significance. These groups' includes 28 Genus and 38 species of algae in current investigation.

**Keywords:** algae, diversity, Nandurbar, fresh water and phytoplankton's

### Introduction

Algae are ubiquitous group of plants with aquatic photosynthetic mechanisms with specific pigment system (Adoni *et al.*, 1985) [1]. They are too closely associates of the aquatic environment; and help in maintenance and purification of environment in both aquatic and terrestrial habitat too. A study of algal diversity and their availability popularly known as Phycology that's contributes an important branch of botanical research having for reaching implications (Chaturvedi *et al.*, 1999, Ponmanickam *et al.*, 2007) [2, 15]. The quality of water bodies can be assessed by the qualitative and quantitative studies of aquatic flora and fauna (More RR. 2017) [9]. Aquatic floras are shows autotrophic mode of nutrition and hence play a key role in aquatic community and freshwater basin ecosystems (Chellappa *et al.*, 2008, Goswami 2012) [3, 4]. These Aquatic floras are act as primary producers and make first tropic level ecosystem.

Investigation and observations of these primary producers help to harbor natural water variety for their aquatic flora and fauna. These are helps to maintain the dynamic equilibrium of the environment (Pawar *et al.*, 2006) [14]. The physiochemical condition of water such as pH, conductivity, Chemical Oxygen Demand (COD) and Biochemical Oxygen Demand (BOD) etc can be predicated by studying number and diversity of algal flora and fauna in particular water bodies (Nandan and Borse 1996, Mallin *et al.*, 2007) [13, 7].

Most of the algae are widely present in freshwater like in lakes, rivers and streams. They have a major importance in the freshwater environment, in terms of their ecology and in relation to mankind. Sinha and Srivastava (1991) [16] and Muhammad *et al.* (2005) [12] reported that the high and maximum production of phytoplankton is obtained when the

physico-chemical factors are at optimum level in specific fresh water environment. The Chlorophyta (green algae), Cyanobacteria and Bacillariophyta (diatoms), are the main groups of alga belongs to fresh water ecosystems (Marathe 1967) [8].

### Material and Method

**Study area:** Nandurbar District is part of northern state of Maharashtra. It belongs to Nashik division situated between 73.31 and 74.32 East longitude and 21.03 and 22.00 North latitude. Nandurbar district having fresh water, well known Tapi River which covers most of the talukas like parts of Shahada and some parts of Akkalkuwa (More RR 2019) [11].

**Sampling:** The water samples for Phytoplankton were collected from Tapi River of fresh water bodies in Nandurbar district at specific place of Prakasha Village. The water sample place into an 200 ml plastic bottle, this process required 3-4 times and collection of samplings were done with the help of forceps, scalpels by using Henson's standard plankton net having pore size of 25  $\mu\text{m}$ . Collected samples were processed in laboratory and observed under microscope by preparing wet mounts within 48 hrs (More RR 2019) [11]. Algae were identified using the monographs and relevant available literature related like online data base, periodicals and research papers etc (Govindan 1990, Mahajan and Mahajan 1990: Nandan S.N. and Borse 1996) [5, 6, 13].

### Results and Discussion

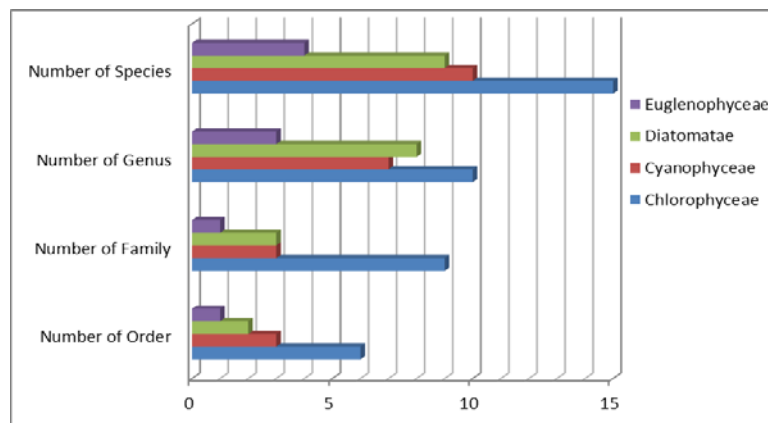
The collected samples were used for the identifications and observations of algal diversity among study area. Four major classes were isolated with respective to their Order, Family, Genus and Species (Table. 01).

**Table 1:** List of Algae diversity

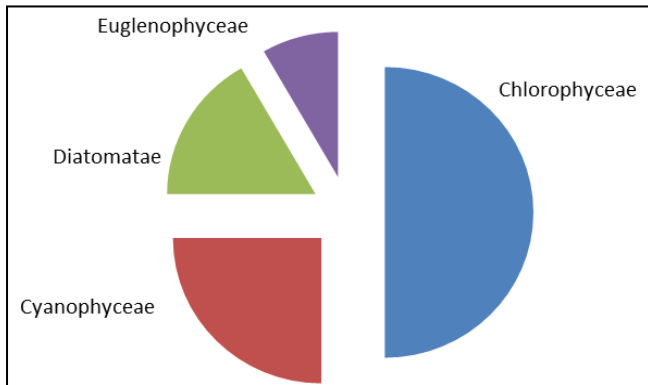
Sr No	Class	Order	Family	Genus	Species
1	Chlorophyceae	Volvocales	Chlamydomonadaceae	<i>Chlamydomonas</i>	<i>reinhardi</i> Dang
2		Tetrasporales	Palmellaceae	<i>Sphaerocystis</i>	<i>schroeteri</i> Chodat
3		Chlorococcales	Chlorococcaceae	<i>Chlorococcum</i>	<i>vitiosum</i> Printz
4			Micractiniaceae	<i>Trochiscia</i>	<i>aciculifera</i> Hansgirg
5			Hydrodictyaceae	<i>Pediastrum</i>	<i>boryanum</i> Reinsch
6				<i>Pediastrum</i>	<i>simplex</i> Meyen
7		Coelastraceae	<i>Coelastrum</i>	<i>microparum</i> Naegeli	
8		Oedogoniales	Oedogoniaceae	<i>Oedogonium</i>	<i>curvum</i> Hirn
9				<i>Oedogonium</i>	<i>curvum</i> Hirn v. <i>major</i>
10				<i>Oedogonium</i>	<i>rufescens</i> v. <i>saxatile</i>
11		Desmiales	Desmidiaceae	<i>Closterium</i>	<i>dianae</i> Ehrenberg.
12				<i>Closterium</i>	<i>granulopolaries</i> Jose John.
13		Zygnemetels	Zygnemetaceae	<i>Euastrum</i>	<i>inermis</i> (Nords)
14				<i>Spirogyra</i>	<i>gibberosa</i> Jao
15				<i>Spirogyra</i>	<i>hollandiae</i> Taft
16	Cyanophyceae	Chroococcales	Chroococaceae	<i>Microcystis</i>	<i>viridis</i> (A. Br) Lemm
17				<i>Chroococcus</i>	<i>turgidus</i> (Kutz.) Nag
18				<i>Gleocapsa</i>	<i>granosa</i> (Bark.) Kutz
19				<i>Gleotheca</i>	<i>samoensis</i> Wille
20		Pleurocapsales	Pleurocapsaceae	<i>Myxosarcina</i>	<i>burmensis</i> Skuja.
21		Nostocales	Oscillatoriaceae	<i>Spirulina</i>	<i>major</i> Kutz. ex Gomont
22				<i>Spirulina</i>	<i>subtilissima</i> Kutez.
23				<i>Oscillatoria</i>	<i>amphibian</i> Ag. ex Gomont
24				<i>Oscillatoria</i>	<i>chalybea</i> (Mertens)
25				<i>Oscillatoria</i>	<i>nigra</i> Vaucher
26	Diatomatae	Centrales	Coscinodiscaceae	<i>Melosira</i>	<i>granulata</i> (Ehr.) Ralfs
27		<i>Cyclotella</i>		<i>catenata</i> Brun	
28		Pennales	Fragilariaceae	<i>Synedra.</i>	<i>ulna</i> (Nitiz) Ehr
29				<i>Mastogloia</i>	<i>recta</i> Hustedt
30				<i>Caloneis.</i>	<i>bacillum</i> (Grun.)
31				<i>Navicula</i>	<i>cuspidata</i> Kuetz.
32				<i>Navicula</i>	<i>terrestris</i> Boy. Pet.
33				<i>Pinnularia</i>	<i>platycephala</i> (Ehr.)
34		Surirellaceae	<i>Surirella.</i>	<i>robusta</i> Ehr	
35	Euglenophyceae	Euglenales	Euglenaceae	<i>Euglena</i>	<i>proxima</i> Dangeard
36				<i>Euglena</i>	<i>spirogyra</i> Ehr.
37				<i>Phacus</i>	<i>asymmetrica</i> Prescott
38				<i>Trachelomonas</i>	<i>volvocina</i> Ehr

**Table 2:** Diversity in number

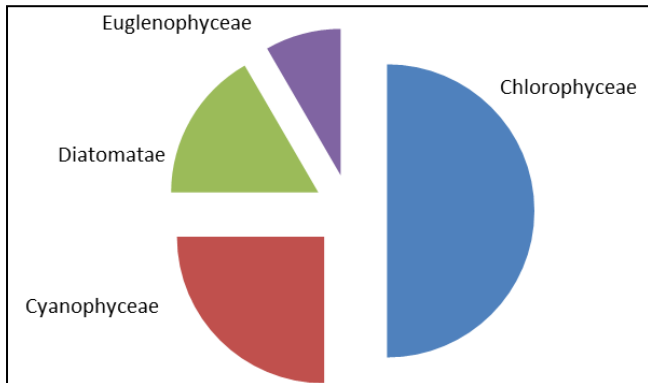
Class	Number of Order	Number of Family	Number of Genus	Number of Species
Chlorophyceae	06	09	10	15
Cyanophyceae	03	03	07	10
Diatomatae	02	03	08	09
Euglenophyceae	01	01	03	04
Tot.	12	16	28	38



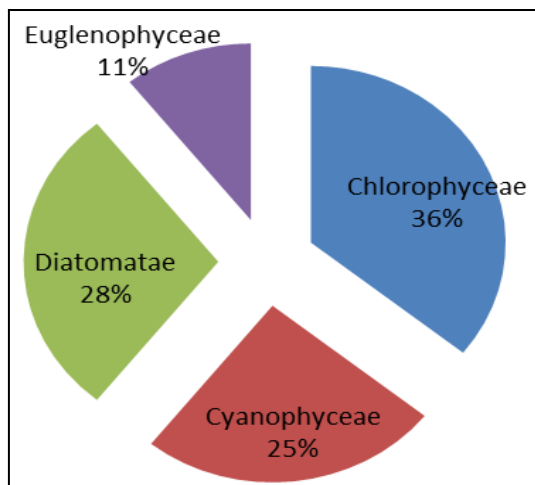
**Graph 1:** Algal Distribution



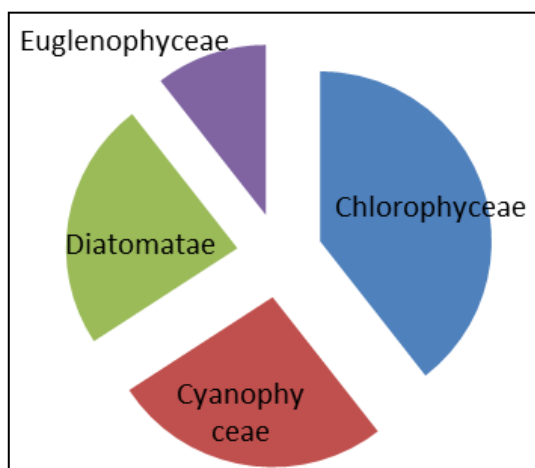
**Graph 2:** Number of Order



**Graph 3:** Number of Family



**Graph 4:** Number of Genus



**Graph 5:** Number of Species

**Conclusion**

In the current study it was seen that fresh water algae are occurrence is high and diverse among study water sources. The diversity of algae in said fresh water body is good and having significance presence of different algal flora. Member of four different class that's belongs to 12 different order and 16 family members of alga have been listed and recorded form Tapi river. These groups are belonging to 28 different genus distributed into 38 species of algae and their number is represented in tabular as well as graphical representation (Table 02. And Graph 1-5).

**Acknowledgment**

Author is thankful to the Principal Jijamata College Nandurbar for their constant encouragement and able guidance throughout the course of the present study. Author is also thankful to all the teaching and non teaching staff who are directly and indirectly helped to complete work successfully.

**Reference**

1. Adoni A, Joshi DG, Gosh K, Chourasia SK, Vaishya AK, Yadav M, Verma HG. Work book on limnology. Pratibha Publisher. C-10 Gour Nagar, Sagar, India, 1985, 1-166.
2. Chaturvedi RK, Sharma KP, Sharma K, Bhardwaj SM, Sharma S. Plankton community of polluted water around Sanganer, Jaipur. J Environ. Pollut,1999;6(1):77-84.
3. Chellappa NT, Borba JM, Rocha O. Phytoplankton community and physical-chemical characteristics of water in the public reservoir of Cruzeta, RN, Brazil. Braz. J Biol.,2008;68(3):477-494.
4. Goswami HK. Let us minimize global warming impacts by multidisciplinary approach. Bionature,2012;32:51-69.
5. Govindan VS. Seasonal succession of algal flora in waste stabilization ponds; Presp. In Phycology (Prof. M.O.P. Iyengar centenary celebration) Ed. V.N. Rajarao, Today and Tomorrow Print & Pub., New Delhi, 1990, 195-200.
6. Mahajan N, Mahajan AD. On some fresh water blue-green algae from Satpuda range in Jalgaon district (M.S.); Presp. In Phycology (Prof. M.O.P. Iyengar centenary celebration Vol.) Ed. V.N. Rajarao, Today and Tomorrow Print & Pub., New Delhi, 1990, 157-159.
7. Mallin MA, Cahoon LB, Toothman BR, Parsons DC, McIver MR, Ortwine ML, Harrington RN. Impacts of a raw sewage spill on water and sediment quality in an urbanized estuary. Marine Pollution Bulletin 2007;54:81-88.
8. Marathe KV. Studies on soil algae of India-I, soil algae from cultivated fields of Dhulia (Maharashtra State); J. Uni. Bombay 1967;35(3&5):100-105..
9. More RR. Review on Hydro biological Studies from Maharashtra. International Journal of All Research Education and Scientific Methods (IJARESM) ISSN: 2455-6211, Impact Factor: 2.287 2017, 128-122. (UGC Approved Journal). 2017, 5(6).
10. More RR. Desmids Diversity and variation in Shivan Dam of Nandurbar District (MS) India. International Journal of All Research Education and Scientific

- Methods (IJARESM) ISSN: 2455-6211, Impact Factor: 2.287 (UGC Approved Journal), 2018;6(6):33-36
11. More RR. "Study of Atmospheric Temperature, Water Temperature and pH of Shivan Dam Water From Nandurbar District (Ms) India ", IJRAR - International Journal of Research and Analytical Reviews (IJRAR), E-ISSN 2348-1269, P- ISSN 2349-5138, Journal No : 43602 2019;6(1):848-853, January-2019.
  12. Muhammad A, Abdus S, Sumayya I, Tasveer ZB, Kamran AQ. Studies on monthly variations in biological and physico-chemical parameters of brackish water fish pond, Muzaffar Garh, Bahauddin Zakariya University, Multan, Pakistan. Pak. J Res. Sci.2005;16:27-38.
  13. Nandan SN, Borse SC. Studies on the rhizosphere algae of cultivated vegetable crop *Hibiscus esculantus* L.;J. Phyto. Res. 1996;9(1):67-69.
  14. Pawar SK, Pulle JS, Shendge KM. The study on phytoplanktons of Pethwaj Dam, Taluka Kankhar, District Nandenda, Maharashtra. J Aqua. Biol., 2006;21(1):16-22.
  15. Ponmanickam P, Rajagopal T, Rajan MK, Achiraman S, Palanivelu K. Assessment of drinking water quality of Vembakottai reservoir, Virudhunagar district, Tamil Nadu. J Exp. Zool. India 2007;10(2):485-488.
  16. Sinha VRP, Srivastava HC. Aquaculture productivity. Oxford and IHB Publishing Co. Pvt. Ltd. New Delhi, 1991.