

# Study Of Algal Biodiversity In Panvel Region Of Konkan, Maharashtra

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**Abstract:** *The present study is carried out during the year 2019 to 2020 to investigate the seasonal diversity of phytoplankton in Panvel Lakes (Mahatam Phule A. S. C. College, Dam, Karanjade Dam. Gadhi river, Shantivan, Nere Nandgav Dam (on the road side of Mumbai Pune Highway, Krishna, and Dewale Lake) by studying July to January. In all the five lakes 8 genera of phytoplankton were recorded. Out of which 6 genera as belong to the Chlorophyceae, 1 genera belong to Cyanophyceae and Charophyceae, genera as belong to Trebouxiophyceae. Among phytoplankton, Chlorophyceae were dominating over others. Biodiversity of freshwater and marine algae plays an essential function as a source of food, feed, fodder, fertilizer, and medicines around the world, since prehistoric times.*

## 1. INTRODUCTION

The study of algae is referred to as the Algalogy of Phycology. The algae constitute a large heterogeneous array of rather basic plants. The group is regarded to be primitive one from which were evolved more complicated cryptogams and later spermatophyte. Algae are widely present in freshwater environments, such as lakes, pond, and rivers, They are simple creatures, without differentiation into roots, stem, and leaves. Their sexual organs are not enclosed within protective coverings. Some algae have become secondarily heterotrophic, taking up complex organic molecules through organography or heterotrophy (Tuchman, 1996). The water reservoir of which water is used for drinking purposes by a human being, animal it is used for irrigation purpose has several applications. Some important aspects are may algae secrete several extracellular products mostly. The organic materials, which belong to polysaccharides, nitrogen compounds, amino acids, enzymes, and several other chemical compounds. The secretion of these extracellular products plays an important role in the presence of several other species of plants, animals in water bodies. Algae is may time responsible for water pollution, water reservoirs caution of phosphate and other pollutants has the rich amount of domestic sewage result in algal blooms containing species of *Oscillatoria*, *Chlorella*, *Microcystis*, *Closterium* and *Diatoms*, and other planktonic algal wise a dusty water smell in the water. During the second and third decades of the present century several fundamentals differences among the several. The several algae were found these convinced the modern physiologist that the different series of algae denote the number of parallel lines of development. This view of the farmer division. The halophytes and sub-division algae and the devotion of its classes to the rank of division.

The knowledge about the biodiversity of lakes combined with their existing conservation state can help in the wise use of these lakes, enabling their sustainable exploitation, for the benefit of humankind through maintaining its natural features (Tiwari and Shukla 2007)). The

purpose of the present analysis is to analyze the changes of the phytoplankton abundance concerning different seasons (Singh et al 2010).

## 2. MATERIALS AND METHODS:

### Collection and study of algal samples:

Total 8 samples were collected from five different places from the lake of Panvel throughout June 2019 to 2020. The collected algae were rinsed in seawater and freshwater thoroughly to eliminate the epiphytes and other contaminants. Then the washed algae samples were immediately put into a vial. Then these bottles were branded and brought to the laboratory. Collected species of algae were kept in formalin solution for identification to validate their taxonomic place. and Identification of macro marine algae species was done by referring Taylor (1960), Deodhar(1987), and Dinabandhu Sahoo (2009) and other earlier publications

## 3. EXPERIMENTAL RESULTS

Total 8 one algal taxa were recorded from different locations of Panvel Lake. These belonged to Chlorophyceae, Cyanophyceae, and Trebouxiophyceae. They were recorded as planktonic or epilith of the submerged stones inside the water. For algal taxa belonging to Chlorophyta, Euglenophyta, Heterokontophyta the classification of Lee (1999) was followed. The brief information about these algal species is as follows,

### I.Class –Chlorophyceae (Green algae)

#### 1. *Oscillatoria*

**Characters:** It is found inside the water of ponds and streams. It is also founding seawater, moist soil, rocks, and stones. The plant body of *Oscillatoria* is filamentous. Filaments are without mucilaginous sheath, is known as “Trichome”. Each Trichome consists of simple, undifferentiated cells which are much broader to their length. In the majority of forms, Trichomes like without distinctly recognizable base or apex. The apical cell of the Trichome be rounded, conical, dilated, or tipped. The cell wall is covered by a mucilaginous sheath. protoplasm has two parts: Chromoplasm and Centroplasm. Chromoplasm is peripheral blue green part and contains pigments like Chlorophyll and Phycocyanine. Centroplasm is the central, colorless part containing a nucleus. The upper part of filament moves on both lateral sides like a 3 pendulum, this is known as “Oscillating movement (Plate, V & VI).

#### 2. *Spirogyra*:

**Characters:** Thallus is multicellular and filamentous. The filaments are unbranched. Filaments are uniseriate being composed of a large number of cells in a row. The cell of a filament is alike in free-floating species. Cells are cylindrical and almost as long as broad, cell walls are three-layered. The cell has a conspicuous chloroplast, the number of chloroplasts varies from one to several. The chloroplast is band or ribbon-shaped with a smooth or heavy margin. (Plate, I, II, V & VII).

#### 3. *Zygnema*

**Characters:** *Zygnema* is of freshwater filamentous thalloid alga. It grows as a free-floating clump of filaments. The immature plants may be seen hooked to streambeds using a holdfast. The filaments generate a yellow-green to the brilliant green-colored tangled mat and are

comprised of elongate barrel-shaped cells, each bearing two star-shaped (stellate) chloroplasts scattered along the axis of the cell. (Plate, IV. V & VII).

### **3. *Oedogonium* :**

#### **Characters:**

The thallus is multicellular filamentous and branched. A filament is differentiated into three types of cells according to their position. Basal, Intercalary and Apical. The Basal cell of filament functions as a holdfast. This cell lacks green pigment and therefore is nongreen unlike other cells of filament. A cell at the tip of filament is known as Apical cell. The cells that lie between the Basal cell and Apical cell are known as Intercalary cells. These are a major part of the filaments. The cell is cylindrical. It is the most characteristic feature of a cell of the member of *Oedogonium*. Reticulate chloroplast lies internal to the cell wall and runs parallel to the long axis of the cell. (Plate, V & VIII)

### **4. *Hydrodictyon*:**

**Characters:** The plant body is a non-motile coenobium formed of a network of polygons or hexagons. Each coenobium is typically cylindrical of flattened, closed-off both ends single-layered meshwork consisting of a few hundred to several thousand cells developing upon spores. Each cell is cylindrical elongated. The young cell is uninucleated with parietal bands shaped chloroplast and single pyrenoid. On maturity, the cell enlarges and becomes coenocytic, and band-shaped chloroplast becomes reticulate with several pyrenoids. The mature cell maybe 2.3 mm long enclosing a large central vacuole. The cell wall consists of cellulose which may be thick and lamellated. (Plate, V & X)

### **5. *Volvox* :**

**Characters:** The algae is a freshwater planktonic form. *Volvox* is colonial green algae. The cells are organized and hence the plant body is called coenobium. The coenobium of *Volvox* is the largest highly differentiated and well-evolved among motile. Each coenobium is a hollow sphere or ellipsoid with a sharply marked delicate mucilage bounding layer. The cells of coenobium are arranged in a single-layered periphery while the interior part of the coenobium is composed of different mucilage. (Plate, V & XII).

### **6. *Chara*:**

**Characters:** The plant body consists of an erect branched axis attached to the substratum by means of uniseriate, branched, and obliquely septate rhizoids. The thallus of *Chara* has a long, flexuous erect main axis with an unlimited power of growth. The axis shows a distinct differentiation into alternating node and internodes. An internode consists of a single, large, elongated, cylindrical cell. From the node arise short and long branches and stipules. The node consists of a pair of central cells surrounded by a transverse layer to 6 to 20 cortical cells. The long internode consists of a single cell.

## **II. Class – *Trebouxiophyceae***

### **1. *Chlorella***

**Characters:** *Chlorella* may grow in brackish water and moist terrestrial habitats. *Chlorella* is unicellular, small, 5 to 10 µm in diameter, non-motile, spherical ellipsoidal green alga. Its chloroplast is lightly pronounced which may be parietal, cup-shaped, or laminate, and usually possess an indistinct pyrenoid. The pyrenoid is quite conspicuous in certain cases while absent in water. A single centrally situated nucleus lies in the chloroplast cavity. The whole of the protoplasm remains surrounded by the cell wall yellow by the plasma membrane.

Chlorella is known exclusively to reproduce asexually by producing autosports. Gametes and zoospores are usually not formed. During the formation of autosports, the cell content device into 2-4 of sometimes 8 rarely 16 daughter protoplasts. Each such protoplast becomes rounded and secretes a wall and is now called autosports. Autosports are quite similar to parents but are comparatively smaller in size. The liberation depends upon rupture of the parent cell wall and on germination, each grows into a new individual (Plate V & XI).



**PLATE: I**



**PLATE: II**

**Plate I & II: Showing water reservoir of Mahatma Phule A. S. C. College, Panvel Dam with Algae Spirogyra**



**Plate III: Showing water reservoir of Karanjade Dam with Algae Spirogyra**



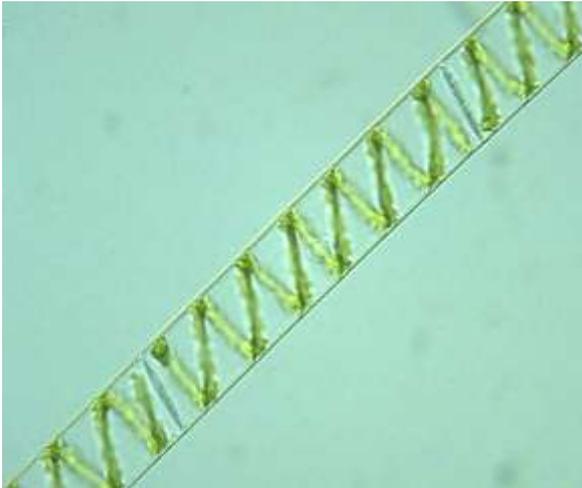
**Plate IV: Showing water reservoir of Dam with Algae, Zygnema**



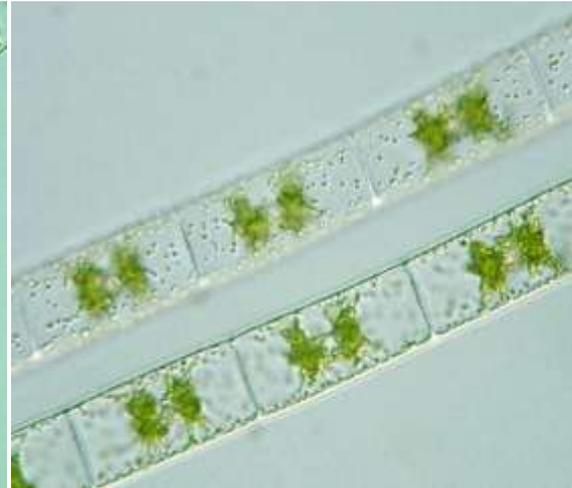
Plate V: Showing collected algae in the bottles.



Plate: VI: Showing microscopic structure of *Spirogyra*



**Plate VII: Showing microscopic structure of *Spirogyra***



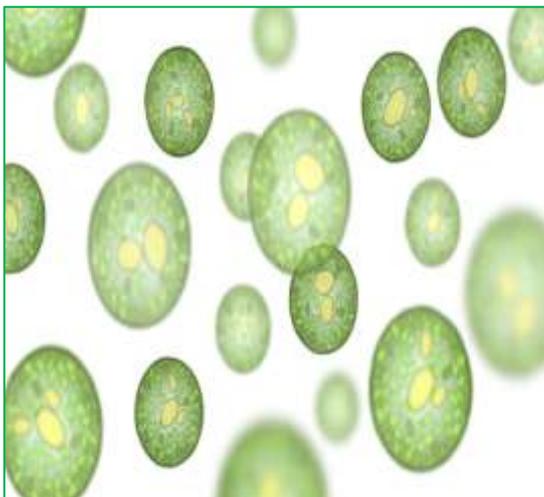
**Plate: VIII: Showing microscopic structure of *Zygnema***



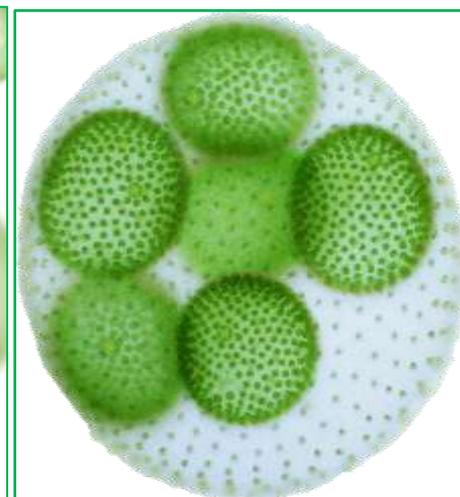
**Plate IX: Showing Microscopic Structure of Algae, *Oedogonium***



**Plate X: Showing Microscopic Structure of Algae, *Hydrodictyon***



**Plate XI: Showing Microscopic Structure of Algae, *Chlorella***



**Plate: XII: Showing microscopic Structure of Algae, *Volvox***

#### 4. DISCUSSION

The present investigation deals with the biodiversity of freshwater algae of Panvel, Raigad District of Konkan, Maharashtra. The macro marine algal species were collected at Panvel, during the rainy season. The freshwater algal biodiversity of the Indian coastline was studied by different peoples at different sites mainly is was (1934) observed the algal from the Khasia and Jaintia hills, Assam. Desikachary (1959) recorded Cyanophyta algae in I.C.A.R., New Delhi. Parukutty, P.R. 1939. Collected algae from Assam. Taylor (1960) studied Marine algae at the Eastern tropical and subtropical coast of the Americas. Prescott (1961) noticed Algae on the Western Great Lakes. Ramanathan (1964) documented Ulotrichales Monographs on Algae in I.C.A.R., New Delhi. Deodhar H. D. (1989). (1989). "submitted Ph. D. thesis on The Biology of marine algae of Bombay at University of Pune. Cox (1996). (1996). Identified of freshwater diatoms from live materials. Kant and Gupta. (1998) published Algal flora of Ladakh, Jodhpur, India. Lee (1999) released book on Phycology at Cambridge University Press, United Kingdom. Komárek, and Anagnostidis. (2005) researched Cyanoprokaryota algae. Tiwari (2006) researched "Seasonal phytoplanktonic diversity of Kithamlake, Agra". Tiwari (2007) examined "Algal biodiversity and trophic condition of certain tempo noticed Algae on the Western Great Lakes. Ramanathan (1964) documented Ulotrichales Monographs on Algae in I.C.A.R., New Delhi. Deodhar H. D. (1989). (1989). "submitted Ph. D. thesis on The Biology of marine algae of Bombay at University of Pune. Cox (1996). (1996). Identified of freshwater diatoms from live materials. Kant and Gupta. (1998) published Algal flora of Ladakh, Jodhpur, India. Lee (1999) released book on Phycology at Cambridge University Press, United Kingdom. Komárek, and Anagnostidis. (2005) researched Cyanoprokaryota algae. Tiwari (2006) researched "Seasonal phytoplanktonic diversity of Kithamlake, Agra". Tiwari (2007) examined "Algal biodiversity and trophic condition of certain Temporal changes in environmental parameters and diversity of net phytoplankton in a freshwater lake. Das et al. (2009) observed Freshwater algae of Meghalaya. Das, and Adhikary. (2014) researched Fresh water algae of Eastern India. Singh et al. (2010) screened Seasonal Diatom Variations concerning Physico-chemical Properties of Water of Mansagar Lake of Jaipur, Rajasthan. Sahoo Dinabandhu, (2010) noticed common seaweeds of India. Sharma (2010) researched "Phytoplankton diversity of two floodplain lakes (pats) of Manipur, northeastern India. Verma, R. (2010) detected Seasonal Distribution of Phytoplankton at Laddie Dam in Sikar District of Rajasthan.

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