

Phytoplankton studies in upper Morna reservoir, Medshi, District-Washim, Maharashtra

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Abstract

The Upper Morna Reservoir is located at Medshi, Malegaon Taluka in Washim district of Maharashtra. Phytoplankton in water bodies act as a biological indicators of water pollution. Phytoplankton acts as primary producers in many aquatic systems, therefore it is necessary to study phytoplankton and also to know the environmental impact found on water bodies. From this reservoir different types of Phytoplankton were studied, mostly algae and diatoms were recorded during the study period January 2012 to December 2013 in which *Gyrosigma kulzingii*, *Navicula*, *Spirogyra*, *Nostoc* were found in abundances.

Keywords: Phytoplankton, Medshi, Upper Morna Reservoir, Washim, Algae and diatoms

1. Introduction

The Upper Morna Reservoir is located in a small village called Medshi, Upper Morna Reservoir which is used mainly for irrigation purpose, fishery purposes and some people use that reservoir for drinking and domestic use. Planktonic forms are the producers in an aquatic ecosystem and also primary food base for nektons like fishes and other fishable organism. In the tropical country like India, highly seasonal rainfall and heavy discharge of water during monsoon result in high flushing rate in the most of the reservoirs. Therefore, the consistency and productiveness of the component is variable [1]. Phytoplankton acts as a biological indicator of water pollution. Phytoplankton acts as primary producers in many aquatic system and also important food source for other organism. Phytoplankton are important in an environmental impact study is as much they are extremely responsive to change in the environment and fluctuation that may occurs. Organism needs energy for any function of body. For supports energy to all activities enters the ecosystem as light which converts to chemical energy by plant during photosynthesis. The rate at which plants assimilates the energy of sunlight is called primary productivity [2].

Primary production by phytoplankton is main process supporting live in the aquatic ecosystems and play a prime role in their biological and chemical characteristics, therefore, knowing the intensity and dynamics of this process to long time scales can help to understand aquatic ecosystems as well as their water quality [3]. Ingole *et al.* [4] observed 33 genera of Phytoplankton of freshwater reservoir at Majgalaon on Sindphana River in which they investigate the phytoplankton groups such as *Chlorophyceae*, *Baciliariophyceae*, *Cyanophyceae* and *Euglenophyceae* and their genera. Ganai *et al.* [5] studied phytoplankton diversity at Watlab Ghat in

Wular Lake Kashmir, they were identified 64 phytoplankton species and Bacilloriophyceae was found to be the most dominant group at the selected site.

2. Materials and Methods

2.1 Site description: The Upper Morna reservoir is constructed on the Upper stretch of the Morna River, one of the minor river of Vidarbha region of Maharashtra is located (18°36'44"N and 76°56'33.61'E) at Medshi, Malegaon Taluka in Washim district of Maharashtra.

2.2 Collection and preservation

2.2.1 Phytoplankton (Algae and diatoms)

The collection of algae is requires minimum equipment: vials, jar and newspapers. Plankton net, which should be at least as fine as 24 mesh is required. Floating of algal mats and aquatic seed plants furnish the larger forms as well as the small epiphytic forms. Collection of concentrated can be made by diatoms, desmids and many planktonic forms. A large handful of material is held over a wide mouthed jar and squeezed thoroughly until nothing more drips into the jar. Many motile forms die and disintegrate rapidly so special care is keeping collection cool and examine it as soon as possible.

Algae are preserved in 3.5 to 4.0% formalin solution in vials and jars. Low that is 2.5 percent of formalin gives good preservation with little if any shrinkage. Diatoms are unicellular algae, usually microscopic, that are characterized by having cell wall of silica, and the critical identification usually involves examination of cleaned material with an oil immersion objective. Cleaning is accomplished by boiling the material with nitric or sulphuric acid to which an oxidizing agent (usually potassium dichromate) is added. It is then repeatedly washed with distilled water, allowing the frustules to settle before decanting or euparal.

Identification of phytoplankton was done by Prescott [6].

3. Result and Discussion

In phytoplankton, Algae and diatoms was found in abundance in Upper Morna reservoir which was found *Gyrosigma kulzingii*, *Navicula*, *pinnularia mobilis*, *Rhopalodia gibba*, *Fragularia capucina*, *Diploneis elliptica*, *Cocconeis placentula*, *Cosmarium monomazum*, *spirulina Pediastrum duplex var. gracilimum*, *pediastrum duplex meyen*, *Merismopedia tenuissima Lemmermann.*, *Spirogyra aequinoctialis*, *Nostoc Punctiforme*, *pectonema Wolleii farlow*, *Cylindrocapsa germinella var. minor minor Hansgirg*, *Closteriopsis longissima*, *Binuclearia tartan*. In the

above mention species *Gyrosigma kulzingii*, *Navicula*, *Spirogyra*, *Nostoc* were found in abundances.

Algae and diatoms are the shows the beautiful appearance, most of the algae are found in superficial area due to photosynthetic activities done by them. *Navicula* species is a diatom with lanceolate valves with parallel striations; it

generally measures 32-36 mm in length and 8-9 mm in breadth. Most of the water of reservoir during summer was found to be covered with the greenery of *spirogyra*. The blue green algae constitute the major part among phytoplankton. Abundance and dominance shown in Fig 1.

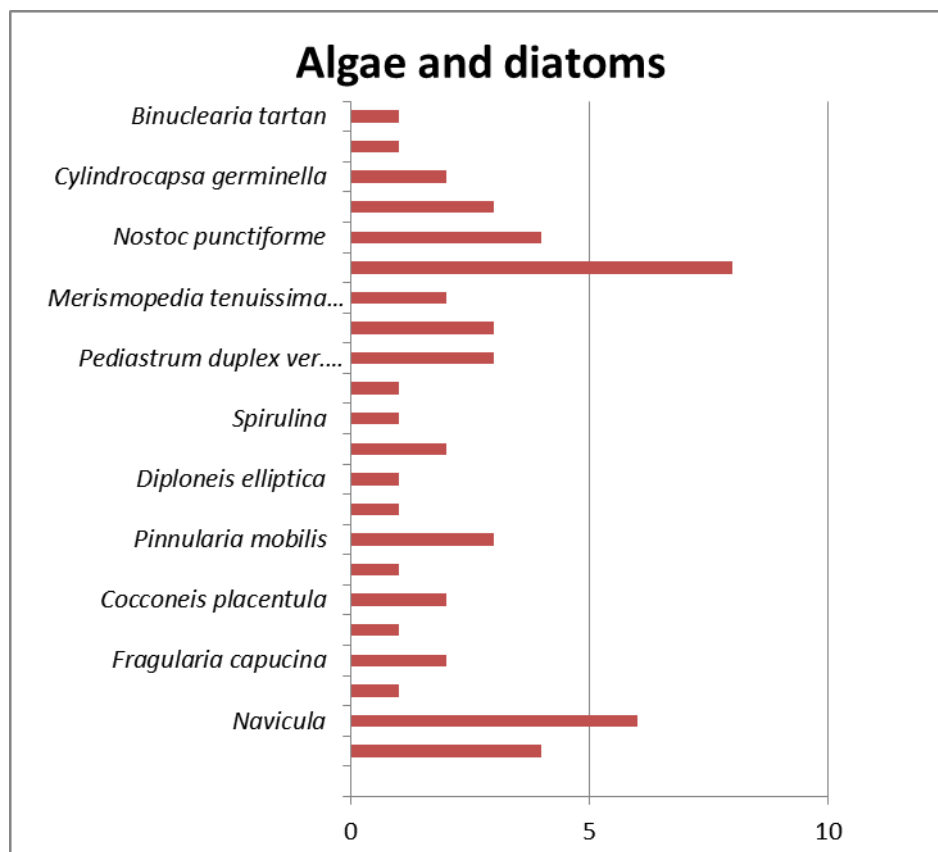


Fig 1: Abundance of algae and diatoms during study period 2012-2013.

The occurrence of particular species of algae determined more by ecological condition than its geographical location. Any detached fragment or plants travel over and it populate the large watersheds of many water bodies. [7] The algae present mainly in those places where the moisture and minerals is present. Verma *et al.*, [8] analysed the phytoplankton and found some similar species mention in study period like *Navicula sp.*, *Pediastrum sp.*, *Cosmarium sp.* along with *Ankistrodesmus sp.*, *Cymbella sp.*, *Mycrocystis* were also indentified in Kankaria lake, Ahmedabad-Gujrat, they recorded that chlorophyceae algal growth is dominated over *cynophyceae*, *bacillariophyceae* and *euglenophyceae*. Sivakumar and Karuppasamy [9] resulted some variations in phytoplankton species i.e. *Cyclotella*, *Anabena*, *Spirogyra scenedamum*, *Oscillatoria*, *Nitzschia*, *Cymbella*, *Fragilaria*, *Arthrospira*, *Microcystis* and told about autotrophic phytoplankton comprises the major portion of lakes and ponds acts as a basic food material in the food chain of aquatic situations., and said that primary production depends upon the temperature, nutrients and light. The growth of algae and diatoms depends upon various factors, such as water temperature influences aquatic weeds and algal blooms and

surrounding air temperature. [10] The intensity of penetration of light is also an important factor for growth of phytoplankton and for the process of photosynthesis. According to Jhingran [11] with variation in geographical location of pond the available intensity of incident light, it depends on the capacity of light penetration.





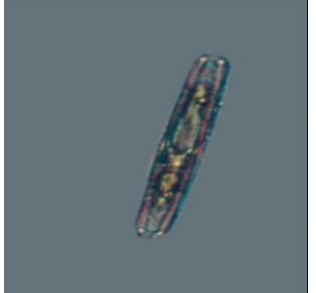

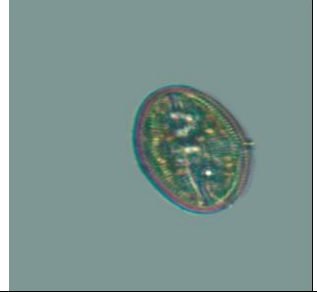

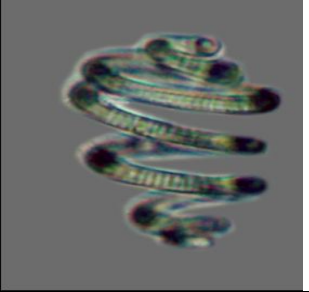
4. Conclusion

Phytoplankton is important parameter for determination of environmental impact on water bodies. The growth of phytoplankton fluctuates according to seasonal changes and certain physico-chemical factors like temperature, light and other parameters. Phytoplankton acts as bio-indicator for water pollution.

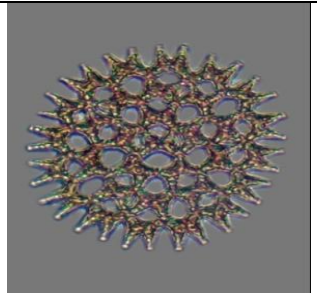
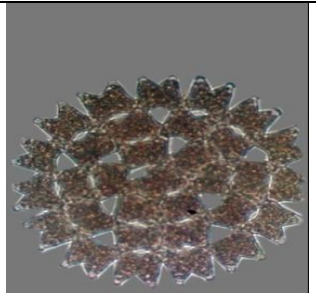
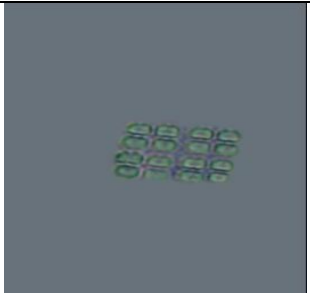
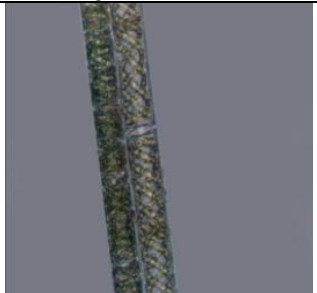

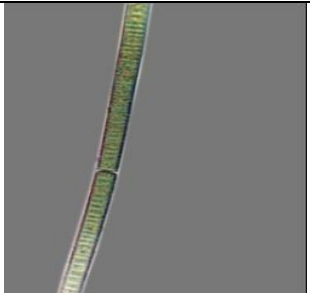
5. Acknowledgement

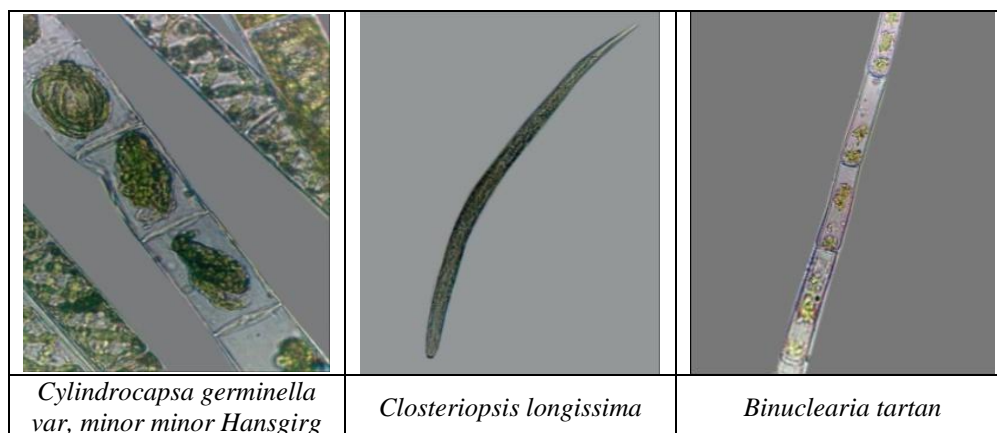
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(Algae and Diatoms)

		
<i>Gyrosigma kulzingii</i>	<i>Navicula</i>	<i>Pinnularia mobilis</i>
		
<i>Rhopalodia gibba</i>	<i>Fragularia capucina.</i>	<i>Diploneis elliptica</i>
		
<i>Cocconeis placentula</i>	<i>Cosmarium monomazum</i>	<i>Spirulina</i>

(Algae and Diatoms)

		
<i>Pediastrum duplex var. gracilimum.</i>	<i>Pediastrum duplex meyen</i>	<i>Merismopedia tenuissima Lemmermann.</i>
		
<i>Spirogyra aequinoctialis</i>	<i>Nostoc punctiforme</i>	<i>Pectonema Wollei farlow</i>



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