

Diversity of Chlorophyceae (Green Algae) in the Nalganga Reservoir District Buldhana, Maharashtra

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Abstract: The Nalganga reservoir is located in Movtala Taluka, District Buldhana, Maharashtra, the closet city to Malkapur (Latitude: 20° 43' 34" N, Longitude: 76° 10' 49" E). The reservoir is essential to human life and rich in nutrients and minerals. The reservoir is not only used for different recreational activities but also supplies drinking water to the local people. The chlorophyceae is a broad and varied family of freshwater algae that includes individuals with significant ecologically and scientifically. Diversity of chlorophyceae as studied in the Nalganga reservoir over a two years period. Alga samples were collected from eight selected sites of reservoir at monthly intervals from October 2022 to September 2024. A total 69 algal taxa under 27 genera were identified and recorded. Taxa of free-floating, planktonic, submerged, and attached chlorophyceae algae were identified during the whole study period, of which *Oedogonium* sp., *Chlorococcum* sp., *Ankistrodesmus* sp., *Scenedesmus* sp., *Cosmarium* sp., *Spirogyra* sp., *Pediastrum* sp. and *Chlorella* sp. were the most common species found throughout the year.

Keywords: Nalganga reservoir, Chlorophyceae diversity, water quality, fresh water algae, drinking water source

1. Introduction

The Chlorophyceae or green algae are broad and significant category of algae that can range in size from simple single-celled organisms to intricate multicellular organisms. The chlorophyceae are a large and important group of freshwater green algae. They include some of the most common species, as well as many members that are important both ecologically and scientifically. These are found almost everywhere there light to perform photosynthesis (Kalitha, et. al. 2015), including fresh water habitat, sea, rivers, lakes, soil, walls, and animals and are free floating, planktonic and submerged. While some are located in or on damp soil or tree trunks, other are attached epiphytic, endophytic, endozoic, parasitic, or symbiotic. This group represents a significant part of the aquatic flora and is essential to preserving the right balance between the biotic and abiotic elements of the aquatic ecosystem. Members of this group serve as the food chain and are a good source of food for many animal groups, either directly and indirectly (Rao, 1975). Many authors have used the density and variety of phytoplankton and their correlation as biological markers for the evaluation of water quality or trophic condition (Subaramanian, et al 1965 and Handa, et al. 2015). Several researchers have also examined the diversity of chlorophyceae in diverse freshwater bodies in India (Jakher 1990, Bais 1995, Andhale 2008, Talekar and Jadhav 2010, Magar 2008, Mahadik and Jadhav 2014, Barmen 2015 and Sawdekar and Jadhav 2017). However, study on diversity of chlorophyceae algae in the fresh water body of Nalganga reservoir is very little. Till now there is no report found on chlorophyceae diversity in the Nalganga reservoir. Therefore, the goal of the current investigation was to determine the diversity of the chlorophyceae (Green algae) population in the Nalganga reservoir district Buldhana.

2. Materials and Methods

To study the diversity of Chlorophyceae in the Nalganga reservoir water, eight sampling sites were identified in the reservoir. Algal samples were collected from selected sites of Nalganga reservoir at every month regular intervals from these locations in the morning between 8.00 am to 10.00 am. For two years i.e. October 2022 to September 2024 the collection were produced. Samples of algae were collected using acid-washed collection bottles. Samples of floating, planktonic, submerged and connected epiphytic algae were gathered individually in collecting bottles. For additional taxonomic studies, collected algae samples were stored in 4% formalin. Both fresh and preserved algal samples were carefully examined under a research microscope and identified Chlorophyceae algae was done using standard algal literature.

3. Results and Discussion

A total of sixty nine taxa of chlorophyceae under twenty seven genera were recorded from eight sampling sites of Nalganga reservoir during the whole study period (Table 1). *Oedogonium* sp., *Chlorococcum* sp., *Ankistrodesmus* sp., *Scenedesmus* sp., *Cosmarium* sp., *Spirogyra* sp., *Pediastrum* sp. and *Chlorella* sp. were the most common genera of chlorophyceae in the reservoir. The highest number of diversity of chlorophyceae was found at site 3 and site 7 having twenty four chlorophyceae species while lowest diversity was recorded at site 5 where only nineteen chlorophyceae species were recorded. The most prevalent species throughout the year were *Ankistrodesmus* sp., *Cosmarium* sp., *Chlorella* sp. and *Chlorococcum* sp. *Ankistrodesmus* sp. was the dominant species which was represented throughout the investigation period at all selected sites. Palmer (1969) and Padma et al. (2017) were

the most common species found throughout the year. *Scenedesmus* sp. and *Chlorella* sp. are considered as indicator of highly organic polluted waters and reflect the eutrophic character of the lake, according to Verma et al. (2012). Chlorophyceae genera such as *Tetraedron*, *Scenedesmus*, *Oocystis*, *Spirogyra*, *Closterium* and *Cosmarium* were found abundant by Nandan and Mahajan (2007). In their study of the chlorococcales of the Manjara River, Talekar and Jadhav (2010) found that *Scenedesmus*, *Pediastrum*, *Tetraedron*, *Ankistrodesmus*, and *Crucigenia* predominant. According to Mahadik and Jadhav (2014), Chlorophycean algae predominant in the Ujani reservoir in Maharashtra. *Spirogyra*, *Scenedesmus*, *Cosmarium*, *Cladophora*, *Gloeocystis*, and *Chlorella* were found to be most common. Debashri Modali (2020) Chlorophycean algae were recorded during the whole study period of which *Ankistrodesmus* sp., *Cosmarium* sp., *Chlorella* sp. and *Chlorococcum* sp. were the most common species found throughout the year. The presence of Chlorophyceae algae in the Nalganga reservoir is consistent with the findings of these researchers. All of the Nalganga reservoir selected sites showed a diversity of Chlorophyceae algae in terms of both number and quality

4. Conclusion

The current study indicates that Nalganga reservoir promotes the growth of a substantial Chlorophyceae population. Other pollution-tolerant Chlorophyceae genera were found throughout the investigation, indicating the eutrophic condition of the reservoir. Hence, it is essential to periodically examine the reservoir water before consuming it, and the water in reservoir must be carefully maintained to maintain its Chlorophyceae population.

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Table 1: Chlorophyceae algal taxa recorded from the sampling sites of Nalganga Reservoir

Algal Taxa	Sampling Stations							
	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	Site 7	Site 8
<i>Ankistrodesmusfalcatus</i>	+	+	+	+	+	+	+	+
<i>Crucigeniatetrapedia</i>	+	+	+	-	-	+	+	-
<i>Chlorella vulgaris</i>	+	+	+	+	+	+	+	+
<i>Chlorococcumhumicola</i>	+	+	+	+	+	+	+	+
<i>Cladophorasp.</i>	+	+	-	-	-	+	+	+
<i>Closteriumsp.</i>	+	+	+	-	+	+	+	-
<i>Coelastrumsp.</i>	-	+	+	+	-	+	+	+
<i>Comariumsp.</i>	+	+	+	+	+	+	+	+
<i>Euastrumsp.</i>	-	+	+	+	+	+	+	-
<i>Gloeocystissp.</i>	+	+	+	-	+	+	-	+
<i>Mougegeotiasp.</i>	+	-	+	+	-	+	+	+
<i>Nitella sp.</i>	+	-	+	+	-	+	+	+
<i>Oedogonium sp.</i>	+	+	+	+	+	+	+	+
<i>Pandorina sp.</i>	-	+	+	+	+	-	+	-
<i>Pediastrumsp.</i>	+	+	+	+	+	+	+	+
<i>Schroederiasetigera</i>	+	+	+	+	-	+	+	-
<i>Selenastrumwestii</i>	+	-	-	+	+	-	-	+
<i>Senedesmus sp.</i>	+	+	+	+	+	+	+	+
<i>Spirogyra sp.</i>	+	+	+	+	+	+	+	+
<i>Stauratrumsp.</i>	+	-	+	-	+	+	+	+
<i>Stigeocloniumlubricum</i>	+	+	+	+	-	+	-	+
<i>Tetraedronsp.</i>	+	-	+	+	+	-	+	+
<i>Tetrasporasp.</i>	+	+	+	+	+	-	+	+
<i>Trebouxiahumicola</i>	-	+	+	+	+	+	+	-
<i>Trochisciasp.</i>	+	+	+	-	+	-	+	+
<i>Ulothrixsp.</i>	-	+	+	+	-	+	+	+
<i>Zygnemasp.</i>	+	+	+	-	+	+	+	+
	22	22	25	20	19	22	24	21

+ Present, -Absent