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Seasonal variation and diversity of Chlorophyceaen Algae in paddy field area of Nagbhid Tehsil, Chandrapur district, Maharashtra. India

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ABSTRACT: The diversity of Chlorophyceae in relation to seasonal variation of paddy fields of Nagbhid Tehsil, District Chandrapur, Maharashtra has been undertaken for the first time in this area. The continuous seasonal collections have been made during regular field visits in the year 2017 to 2019. Total 22 Chlorophyceae taxa could be identified in the present investigation belonging to various orders i.e., Zygnematoles, Chlorellales, Ulotrichales, Sphaeropleales, Oedogoniales, Chaetophorales, etc. Rice fields provide a very comfortable habitation to different kinds of algae occurring in the stagnant water, prevalent high temperature and high humidity in the rice fields. The present investigation reveals that the comparatively maximum number of Chlorophyceae members is growing in the rainy season in comparison to winter and summer seasons.

KEWARDS: Paddy, Chlorophyceae, Nagbhid Tehsil, Diversity.

I. INTRODUCTION

Chlorophyceaen flora from a different region of India has been studied by various authors like Prescott 1931; Tipparan and Yuwadee 2012; Hosmani 2013, Satpati 2013; Das and Adhikary 2014; Patil and Deore 2017; Farishta Yasmin et.al 2015, and Rajeshwari and Krishnamurthy 2015.

The Chlorophyceae is a large and unique group of freshwater green algae which are important both economically and scientifically. The green algae play an important role acting as a primary producer and also increase the fertility of the soil in paddy fields. (Amit Kumar and Radha Sahu 2012). Algalization seems to have little effect on the physical properties of the soil, however, it may improve soil aggregation (Sankarama.1917). algae are also used as biological indicators of water pollution (Subramanian, 1996, Handa and Jadhav,2015). Chlorophyceae members form the base of the food chain, are directly or indirectly a good source of food for various animal groups (Rao,1975). In recent years it is used as an alternative source for food, fodder medicine, and also an important tool for researchers in nanotechnology, space biology, Genetics, and other fields of applied sciences (Shrestha et.al. 2013).

Thus it is essential to study the diversity of green algae in fluctuating physicho-chemical parameter of paddy fields area 06 Nagbhid Tehsil to conserve and to maintain the ecosystem

II. MATERIAL AND METHODS

Area of Study:

In present investigation four study areas, of Nagbhid Tehsil namely Mohadi area, Talodhi area, Navegaon area and Nagbhid area were selected for the sampling of water, soil, and algal flora pertaining to the respective study area in different seasons. Mohadi Area which is located 10 km from Nagbhid towards north (Longitude 79°40’0” E and Latitude 20°35’0” N). Talodhi Area is located 15 km from Nagbhid Towards south (Longitude 79°40’0” E and Latitude 20°35’0” N). Navegaon Pandav area is located 0.9 km from Nagbhid Towards East (Longitude 79°40’0” E and Latitude 20°35’0” N). Nagbhid area is located 0.2 km from Nagbhid city Towards West (Longitude 79°40’0” E and Latitude 20°35’0” N) of Nagbhid Tehsil Dist. Chandrapur, Maharashtra.

Method of sampling and identification

Collections of samples were done during the morning period in clean sample bottles and polythene bags. A small amount of sample was used for the taxonomical identification and the remaining sampling were preserved in 4% formalin for a long time. The collected algal samples were observed

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microscopically using a binocular microscope and identified with standard literature i.e., Prescott G.M. 1951, Desikachary, 1959, Geitler 1932 and Rogland, et.al 2014.

III. RESULTS AND DISCUSSION

Table: 01 Occurrence of Chlorophyceae taxa according to seasonal variation.

Name of Algal Taxa	**Seasonal Variation on taxa Distribution**		
	Rainy season	Winter season	Summer Season
Order- Zygnematales			
1) Spirogyra irregularis	++	+	+
2) Spirogyra submaxima	++	+	*
3) Spirogyra Chakiense	++	++	+
4) Spirogyra inflate	+	+	*
5) Ankistroesmus falcatus	+	+	*
6) Closterium acerosum	+	+	*
7) Closterium acutum	+	+	*
8) Closterium lanceolatum	+	+	*
9) Cosmarium granatum	+	+	*
10) Cosmarium trilobatum	+	+	*
Order- Chlorellales			
11) Chlamydomonas globose	+	+	*
12) Chlorococcum humicolum	+	+	*
13) Scenedesmus bijugatus	+	+	*
14) Chlorella vulgaris	+	+	*
15) Protococcus viridis	+	+	*
Order-Ulotrichales			
16) Ulothrix variabilis	*	+	*

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17) Ulothrix zonata	*	+	*
Order- Sphaeropleales			
18) Selenastrum westii	+	*	*
19) Characium ambigum	+	*	*
20) Coelastrum microsporum	+	+	*
Order- Chaetophorales			
21) Chaetophora pisiformis	+	*	*
Order- Oedogoniales			
22) Oedogonium aquaticum	*	*	*

Key- + = Present, ++ = Dominant, * = Absent

The present investigation reveals total 22 taxa of Chlorophyceae belonging to 06 orders where Zygnematales represent 4 genera and 10 species, Chlorellales represent 4 genera and

05 species, Ulotichales represent 01 genera and 02 species, Sphaeropleales represent 03 genera and 03 species, Chaetophorales represent 01 genera and 01 species, Oedegoniales represent 01 genera and 01 species.

Seasonal variation on a population of Chlorophyceae were seen in most of the seasons in present investigation. Paddy fields in Nagbhid Tehsil shows different habitats in different seasons and different stages of crop growth. In every study site, most of the paddy fields are underwater from June to October (Rainy season). Paddy field soils become marshy from October to December, dry and moist from December to February, fully dry from February to June and vegetative stages of algae are usually not observed in these Months. A qualitative study of algae in the

paddy field by (Gupta,1966) showed that they began to grow one month after the first monsoon rain, the algal community was poor in both quality and quantity and was dominated by spirogyra species. Maximum occurrence of Cosmarium and Scenedesmus was reported during winter because after paddy cultivation in the field most of the members of Chlorellales, Zygnematales were reported in maximum numbers while members of Oedogonials, Ulotrichales, Spheropleales, and Chaetophorales represented very few taxa. The population of Chlorella Vulgaris was very low throughout the year except for the rainy season. This study reveals that most of the Chlorophyceae members are growing in lesser number during the summer in comparison to the rainy and winter season.

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