

RESEARCH ARTICLE

Biodiversity of aeroalgae in the cultivated fields of Nagpur

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Manuscript details:	ABSTRACT
<p>Available online on http://www.ijlsci.in</p> <p>ISSN: 2320-964X (Online) ISSN: 2320-7817 (Print)</p> <p>Editor: Dr. Chavhan Arvind</p> <p>Cite this article as: Bodkhe Seema S (2016) Biodiversity of aeroalgae in the cultivated fields of Nagpur, <i>Int. J. of Life Sciences</i>, A6: 105-107.</p> <p>Copyright: © Author, This is an open access article under the terms of the Creative Commons Attribution-Non-Commercial - No Derives License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.</p>	<p>In the present study aerobiological survey was conducted in order to identify the various viable airborne algal spores and fragments with their seasonal variation in Nagpur. The present investigation includes one year survey (Jan2008 to Dec.2008) using slide exposure to the Soyabean fields atmosphere for specific time. Total 18 algal species were observed in the present study. Out of the total 18 species reported 14 belongs to Cyanophyceae and 4 to Chlorophyceae. The genus <i>Chroococcus turgidus</i>, <i>Nostoc muscorum</i>, <i>Westiellopsis prolifica</i> and <i>Chlorella vulgaris</i> were predominantly observed whereas <i>Lyngbya lagerheimii</i>, <i>Calothrix brevissima</i> and <i>Spirogyra</i> sp. were of least occurrence during the present survey. Cyanophycean members were predominant in the present study. Seasonal variation was recorded in most of the algal species. The optima of aeroalgae was noticed in the summer season (April-June).</p> <p>Key words: Aeroalgae, seasonal variation, cultivated fields, Nagpur.</p>
	<p>INTRODUCTION</p> <p>Aerobiology is one of the important branch concerning the study of airborne akinetes, endospores, exospores, zoospores, heterocysts and fragments of algae. Airborne algae have received relatively little attention. Very few aerophycological studies have been carried out in India.(Mittal, <i>et al.</i> 1973, Nair <i>et al.</i>, 1983, Sharma, <i>et al.</i>, 2006). However the climatic condition in India is more favourable for the algal spores and fragments to be airborne. The aeroalgae of crop fields has been reported by Gaikwad, 1982 from Ahmedpur and Mane, 1982 and Likhitkar and Tarar, 1994 from Nagpur. The present study includes one year study of prevalence of air borne algae of Soyabean field atmosphere of Nagpur.</p>
	<p>MATERIAL AND METHOD</p> <p>Samplings were done by Slide exposure method every week for one hour over the crop fields. Sampling was done weekly during Jan-2008 to Dec-2008. The slides were coated with adhesive glycerin jelly and fixed on Rotorad air sampler. Some slides were used for direct microscopical examination and others were inoculated in 250ml conical flask containing 100ml of sterilized liquid BG-11 and Chu's 10 medium. The conical flasks were incubated in 16:8</p>

light:dark cycle at $28 \pm 1^\circ \text{C}$ temperature for 4-5 weeks. The alga were identified by referring standard literature available.

RESULTS AND DISCUSSIONS

The total numbers of aeroalgae present were 18 species during the period 1st Jan 2008 to 31st Dec 2008. Out of the total 18 species reported 14 belongs to Cyanophyceae and 4 to Chlorophyceae (Table 1.). The genus *Chroococcus turgidus*, *Nostoc muscorum*, *westiellopsis prolific* and *Chlorella vulgaris* were predominantly observed whereas *Lyngbya lagerheimii*, *Calothrix brevissima* and *Spirogyra sp.* were of least occurrence during the present survey.

Cyanophycean members were predominant in the present study. Ramchander Rao, 2005 also reported 80-95% occurrence of cyanobacteria. Composition of the aeroalgae community exhibited seasonal variation (Fig.1). The low algal count has been noticed in the rainy season (July-Sep). The low count recorded may be due to cloudy atmosphere and higher rainfall received during these months. Quite likely the heavy

rains might have washed out the algal spores and fragments from air.

The optima of aeroalgae was noticed in the summer season (April-June). It can be stated that clear atmosphere, low relative humidity and rainfall, dry the algal forms in the soil, subsequently high wind velocities helps in lifting terrestrial and aquatic algae in the air. All these factors are beneficial in the transport of algae over longer or shorter distance, depending on wind velocity.

Sharma, *et al.* (2006) stated that different groups of algae respond differentially to the climatic conditions, resulting in periodicity and seasonal changes in the composition of algal community. Moreover, Kumar, 1990 noticed that the higher incidence of algae in spring and summer and the lowest incidence in the rainy season (July-August). Another similar study by Sharma *et al.* (2006) showed that the most favoured season for the appearance of cyanobacteria in the air was late summer to early rainy season (May and June) while they were the lowest during winter (January and February).

Table1. Seasonal variation in aeroalgae from Soyabean field of Nagpur

Sr. No	Algal Taxa	J	F	M	A	M	J	J	A	S	O	N	D	Algal Freq.
	Cyanophyceae													
1.	<i>Chroococcus turgidus</i>	+	+	-	+	+	+	-	+	-	+	-	-	7
2.	<i>Aphanothece nidulans</i>	-	-	+	-	+	-	-	-	-	-	+	-	3
3.	<i>Oscillatoria decolorata</i>	-	-	-	+	-	+	-	-	-	-	+	+	4
4.	<i>O. curviceps</i>	-	+	-	-	+	-	-	-	+	-	-	-	3
5.	<i>O. subbrevis</i>	-	-	-	+	+	+	-	-	-	+	-	+	5
6.	<i>Phormidium angustissimum</i>	+	-	+	-	-	+	-	-	-	-	+	-	4
7.	<i>Lyngbya lagerheimii</i>	-	-	-	-	+	-	-	-	-	-	-	-	1
8.	<i>Nostoc commune</i>	-	-	-	-	+	+	+	-	-	-	-	-	3
9.	<i>N. muscorum</i>	+	-	+	+	+	+	-	-	+	-	-	+	7
10.	<i>Anabaena variabilis</i>	-	+	-	-	+	+	-	-	-	+	-	-	4
11.	<i>Aulosira fertilissima</i>	-	-	+	+	+	-	-	-	-	-	-	-	3
12.	<i>Calothrix brevissima</i>	-	-	-	-	+	+	-	-	-	-	-	-	2
13.	<i>C. marchica</i>	-	-	-	+	-	+	-	+	-	+	-	-	4
14.	<i>Westiellopsis prolific</i>	-	-	+	-	+	+	+	-	+	-	-	+	6
	Chlorophyceae													
15.	<i>Chlamydomonas reinhardtii</i>	+	-	-	+	+	-	-	-	-	+	-	-	4
16.	<i>Chlorococcum humicola</i>	-	-	+	-	-	-	+	-	-	+	+	-	4
17.	<i>Chlorella vulgaris</i>	-	+	-	+	+	-	-	-	+	+	+	-	6
18.	<i>Spirogyra sp.</i>	-	+	-	-	-	+	-	-	-	-	-	-	2
	Total number of algal taxa observed	4	5	6	8	13	11	3	2	4	7	5	4	

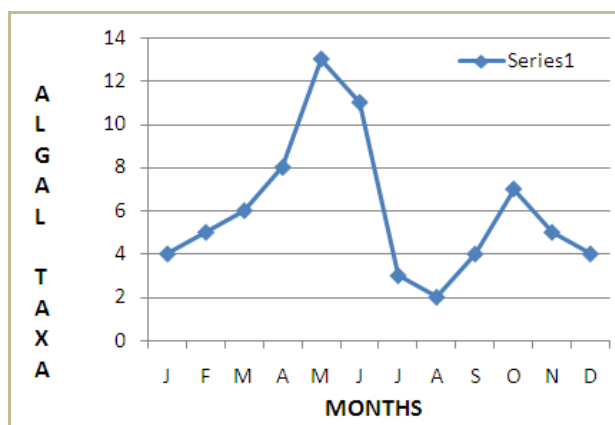


Fig. 1. Graphical presentation of seasonal variation in aeroalgal flora

Cyanobacteria, possibly due to their broad ecological distribution, dominate the fluctuating climate of subtropical regions. Soil borne algae constituted the bulk of aeroalgal flora. This might be due to their ability to withstand the dehydrating effect of the atmosphere.

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