



## AIRBORNE ALGAL FLORA OF AJANTA FOREST IN MAHARASHTRA

Sunita V. Jawale

Department of Botany, Yeshwantrao Chavan College of Arts, Commerce and Science Sillod, Dist- Aurangabad-431112 (M.S.), India.

Milind J. Jadhav

Department of Botany, Sir Sayyed College, Roshan Gate area, Aurangabad-431001 (M.S.) India.

## ABSTRACT

Algal spores and fragments are important component of air microflora. In present study airborne algal flora of Ajanta forest located in Aurangabad district of Maharashtra has been studied in detail. The experiments were conducted for two consecutive years i.e. from August 2014 to July 2016. A total 94 air samples were obtained during study tenure. 42 airborne algal taxa under 25 genera belonging to Chlorophyceae Bacillariophyceae and Cyanophyceae were cultured, identified and recorded. Cyanophyceae members dominated airborne algal flora. Among Chlorophyceae *Gloeocystis*, *Chlorococcum*, *Chlorella* and *Ankistrodesmus* were abundant. Bacillariophyceae was represented by *Hantzschia* and *Nitzschia*. Among Cyanophyceae *Chroococcus*, *Aphanothece*, *Phormidium*, *Microcoleus*, *Nostoc*, *Plectonema* and *Scytonema* were dominant. Airborne algal flora of Ajanta forest is rich and it is in diverse form.

**KEYWORDS :** Airborne, Algal flora and Ajanta forest.

## INTRODUCTION

In the atmosphere different bioparticles such as bacteria, fungal spores, pollen grains, insect scales are present. Algal spores and filaments are also important component of atmospheric microflora. Extensive review of literature reveals that, airborne algal flora of urban area, rural area, over water reservoir, and over crop fields have been well documented. Except very rare report (Sokoloff 1931) a little attention has been paid towards airborne algal flora of forest. Therefore to fulfill this lacuna it has been decided to work on airborne algal flora of Ajanta forest in Aurangabad district of Maharashtra. Agarized culture plate exposure impaction technique was used to isolate and culture airborne algae from the atmosphere of Ajanta forest.

## MATERIALS AND METHODS

In order to study airborne algal flora of forest area, Ajanta forest located in Sillod and Soygaon tehsil area of Aurangabad district in Maharashtra has been selected. The air samples were collected by using petriplates containing agarized Bold's basal medium. Petriplates were exposed on ground level. The duration of exposure was normally of two hours. The frequency of exposure was once in a week. The experiments were conducted for two consecutive years i.e. from August 2014 to July 2016. Exposed petriplates were incubated under the tublights having 1000 to 1500 lux capacity in algal culture chamber. Liquid nutrients medium was poured into the plates at the time of keeping those for incubation and frequently supplemented with the same. This encouraged the growth of algal organisms, besides avoiding drying. Upon visualizing the growth as discrete colony forming units (CFU), they were picked up and identified under research microscope.

## RESULTS AND DISCUSSION

Abundance of algal spores and filaments in the atmosphere of urban area, rural area and over water reservoir is well reported (Overeem 1937, Ramalingam and Parshwnath 1979, Marathe and Reddy (1980), Santra 1987, Sharma and Singh 1992, Jadhav and Chavan 2007, Jadhav and Quazi 2010 and Patil and Patil 2014). Pandkar and Tarar (2010) also studied airborne algal forms in the air of vegetable and fish market. Present research work deals with airborne algal flora of Ajanta forest. A total of 94 air samples were obtained spanning two years i.e. from August 2014 to July 2016. Algal taxa belonged to Chlorophyceae, Bacillariophyceae and Cyanophyceae were cultured, identified and recorded. 42 taxa of airborne algae under 25 genera were isolated from the atmosphere of Ajanta forest, of these 9 taxa under 7 genera belonged to Chlorophyceae, 2 taxa under 2 genera belonged to Bacillariophyceae and 31 taxa under 16 genera belonged to Cyanophyceae. (Table 1 and 2). Sokoloff (1931) isolated several

algae from the air of Chapultepee forest of Mexico. Cyanophyceae algae were found dominant in the atmosphere of Ajanta forest. Jadhav and Chavan (2007), Jadhav and Quazi (2010) and Patil and Patil (2014) also recorded dominance of Cyanophyceae algae in the atmosphere.

Airborne algal taxa which were found abundant during present study were *Gloeocystis gigas*, *Gloeocystis major*, *Chlorococcum humicola*, *Chlorella vulgaris*, *Ankistrodesmus falcatus*, *Nitzschia palea*, *Chroococcus turgidus*, *Aphanothece nidulans*, *Aphanothece saxicola*, *Phormidium jenkelianum*, *Phormidium molle*, *Microcoleus acutissimus*, *Nostoc muscorum*, *Plectonema gracillimum* and *Scytonema bohneri*. Similar kind of observations were made by Jadhav and Quazi (2010) and Patil and Patil (2014). During present study unicellular, colonial and filamentous algal forms were cultured.

Hence it is concluded that air of Ajanta forest contains variety of airborne algae. A total of 42 taxa under 25 genera of airborne algae were recorded. Cyanophyceae algal forms were found dominant which is followed by Chlorophyceae and Bacillariophyceae. Present study will enrich the knowledge of airborne algae in Marathwada region of Maharashtra.

**Table 1: Total number of airborne algal taxa and genera isolated from the atmosphere of Ajanta forest.**

Sr.	Class	Taxa	Genera
1	Chlorophyceae	09	07
2	Bacillariophyceae	02	02
3	Cyanophyceae	31	16
	<b>Total</b>	42	25

**Table 2: Airborne algal flora of Ajanta forest.**

<b>Chlorophyceae</b>
<i>Gloeocystis gigas</i> , <i>Gloeocystis major</i> , <i>Gloeocystis vesiculosa</i> , <i>Tetraspora gelatinosa</i> , <i>Chlorococcum humicola</i> , <i>Trebouxia humicola</i> , <i>Chlorella vulgaris</i> , <i>Ankistrodesmus falcatus</i> , <i>Acinastrum hantzschii</i> .
<b>Bacillariophyceae</b>
<i>Hantzschia sp.</i> , <i>Nitzschia palea</i> .
<b>Cyanophyceae</b>
<i>Chroococcus minor</i> , <i>Chroococcus turgidus</i> , <i>Gloeocapsa rupestris</i> , <i>Gloeothece palea</i> , <i>Aphanothece nidulans</i> , <i>Aphanothece saxicola</i> ,

*Merismopedia tenuissima*, *Myxosarcina burmensis*, *Spirulina major*, *Oscillatoria obscura*, *Phormidium abronema*, *Phormidium ambigum*, *Phormidium corium*, *Phormidium jadinianum*, *Phormidium jenkelianum*, *Phormidium molle*, *Phormidium usterii*, *Lyngbya majuscula*, *Microcoleus acutissimus*, *Microcoleus sociatus*, *Nostoc linckia*, *Nostoc muscorum*, *Nostoc punctiformae*, *Plectonema gracillimum*, *Plectonema nostocorum*, *Scytonema bohneri*, *Scytonema schmidtii*, *Scytonema stuposum*, *Hapalosiphon welwitschii*, *Stigonema hormoides*.

## REFERENCES

- Jadhav Milind and Chavan Ashok M. (2007) Isolation of microalgae from the atmosphere of Chalisgaon town (M.S.) Proc. Nat. Symp. Recent trends in algal Biotechnology and Biodiversity, Ed. S.S. Patil, Faizpur, PP:82-85.
- Jadhav Milind and Quazi Sadat M. (2010) Diversity of airborne algae in the atmosphere of Aurangabad. Bionano Frontier 3:287-289.
- Marathe K. and Reddy, K.V.S. (1980) Algal aerospora of Nagpur, Advances in Pollen Spore Research V-VII Ed. P.K.K. Nair PP:177-184.
- Overeem, M. A. Van (1939) On the green organisms occurring in lower troposphere. Rec. Travel. Bot. Neerl. 34:389-439.
- Pandkar, J. T. and Tarar J. L. (2010) Airborne algal pollutants from a vegetable and fish market at Nagpur. The Botanique. 14(1):PP22-27.
- Patil, V. S. and Patil S. R. (2014) Air dispersion of viable algae in the extramural environment of Pune. Int. J. of Advanced Research 2(4):509-514.
- Ramalingam A. and Parshwnath, H. V. (1979) Seasonal variation in the airborne algae over a rural and urban area. Current science. 48:956-957.
- Santra, S. C. (1987) Airborne algae of Calcutta metropolis Phykos. 26:71-74.
- Sharma, B. and Singh, N. I. (1992) Cyanophycean air pollutants in the air of Imphal. Proc. Of Nat. Symp. on Cyanobacterial nitrogen fixation. PP 515-520.
- Sokoloff, D. (1931) Esperiencias de transmission de microorganismos por el aire y. los Insectos. An. Inst. Biol. UNAM 2:167-169.