



RESEARCH ARTICLE

# House Dust Algae from Aurangabad City of Maharashtra

<sup>1</sup>Milind J. Jadhav & <sup>2</sup>Sunita V. Jawale

<sup>1</sup>Department of Botany, Sir Sayyed College, Roshan Gate area, Aurangabad-413001 (M.S.) India.

<sup>2</sup>Department of Botany, Yeshwantrao Chavan College of Arts, Commerce and Science, Sillod, Dist-Aurangabad-431112 (M.S.) India.

\*Corresponding Author: [dr.mjadhav@gmail.com](mailto:dr.mjadhav@gmail.com)

## Manuscript Details

Manuscript Submitted : 08/04/2021  
Manuscript Revised : 12/05/2021  
Manuscript Accepted : 28/05/2021  
Manuscript Published : 12/06/2021

## Available On

<https://plantaescientia.com/ojs>

## Cite This Article As

Jadhav M J & S V Jawale (2021). House dust algae from Aurangabad city of Maharashtra. *Pla. Sci.* 2021; Vol. 04 Iss. 03:160-162.

## Copyright



© The Author(s). 2021. Open Access  
This article is distributed under the terms  
of the Creative Commons Attribution  
4.0 International License  
<http://creativecommons.org/licenses/by/4.0/>

## Indexed In

[CrossRef](#), [Scientific Indexing Services \(SIS\)](#), [Google Scholar](#), [Index Copernicus International \(ICI\)](#), [Directory of Research Journal Indexing \(DRJI\)](#), [CiteFactor](#), [Scientific Journal Impact Factor \(SJIF\)](#), [General Impact Factor](#), [Journal Factor](#), [Cosmos Impact Factor](#), [PKP Index](#), [AJIFACTOR Indexing](#), etc.

## ABSTRACT

House dust contains different biocomponents. Algae are one of the important biocomponents of house dust and is present in the form of spores and filaments. Dust samples were collected from houses of patients suffering from respiratory allergy in Aurangabad city during September 2017 to August 2018. Total of 34 samples were collected and cultured in the petriplates containing agarized Bold's basal medium (BBM). Algal forms belonged to Chlorophyceae, Bacillariophyceae and Cyanophyceae were cultured and identified. Cyanophycean algae dominated the algal flora of house dust. Algal taxa which were found abundant in-house dust are *Chlorococcum humicola*, *Chlorella vulgaris*, *Nitzshia palea*, *Aphanothece nidulans*, *Phormidium molle*, *Microcoleus acutissimus*, and *Plectonema gracillimum*. 16 algal taxa recorded in the present study are allergenic to human beings.

**Keywords:** House dust, Algae, Allergy

## INTRODUCTION

In house dust different biocomponents such as bacteria, fungal spores and filaments, pollen grains and mites are present. House dust also contains wide variety of algae in the form of algal spores and filaments. Bernstein and Safferman (1970) isolated viable algae from house dust. Lustgraff (1970) cultured algae from mattresses dust. Mittal (1981) isolated algae from dust obtained from various sources viz. floor, sofa, bed and carpet. Singh and Talapsayi (1984) worked on culturing of algae from laboratory glassware dust. Rao and Jadhav (1997) isolated 19 algal forms from outdoor and indoor dust samples. Jadhav and Jain (2007) cultured variety of algal forms from house dust. In present research work we have isolated and identified algal forms from house dust of patients who are suffering from nasobronchial allergy.

## MATERIALS AND METHODS

Floor dust samples were collected from houses of patients who are suffering from nasobronchial allergy. A total of 34 samples were collected from different houses in Aurangabad city during August 2018 to August 2018. Dust samples were collected with the help of broom in sterilized plastic bottles. The bottles were brought to the laboratory, one gram of pulverized sieved dust sample was uniformly spread on agarized Bold's basal medium (BBM) in the petriplates. The petriplate was also supplemented with liquid Bold's basal medium. Exposed petriplates were then incubated under tube lights having 1000 to 1500 lux capacity in the algal culture stand. The temperature was maintained at around 25±1 °C, thus facilitating the growth of the algae. Petriplates were observed at every 4-day interval for checking the growth of algal colonies. After sufficient growth, colonies were picked up and identified under research microscope by referring to the standard literature on algae (Fritsch 1935, 1945, Prescott 1951, Desikachary 1953 and Sarode and Kamat 1984).

## RESULTS AND DISCUSSION

A total number of 26 species under 21 genera were isolated and identified. Of these 4 species under 4 genera belonged to Chlorophyceae, 3 species under 3 genera belonged to Bacillariophyceae and 19 species under 14 genera belonged to Cyanophyceae (Table 1). Cyanophycean algal forms were found in maximum number than Chlorophyceae and Bacillariophyceae. Algal taxa which were found abundant in-house dust samples are *Chlorococcum humicola*, *Chlorella vulgaris*, *Nitzschia palea*, *Aphanothece nidulans*, *Phormidium molle*, *Microcoleus acutissimus*, and *Plectonema gracillimum*. Genus *Phormidium* was represented by 4 species. Algal forms were cultured from all collected dust samples, no algal spores and filaments free dust sample found. All collected dust samples

shown presence of algal spores and filaments. In similar kind of study Jadhav and Jain (2007) isolated 41 algal taxa from house dust samples. Chougule and Andoji (2016) reported 16 algal taxa from house dust samples collected from patients houses who are suffering from respiratory allergy.

It is well known fact that algal spores and filaments contains protein in high amount and are responsible for allergic diseases in human being. Presence of algal forms in house dust is one of the sources of human exposure and sensitization. Algal forms which are reported allergic in human being by earlier workers (Bernstein and Safferman 1970 and 1973, Benaim Pinto 1972, Mittal 1981 and Jadhav and Jain 2007) are isolated during present study (Table 2). Outdoor soil seems to be the major contributor to the indoor dust. Soil when disturbed and blown off, either due to natural winds or vehicular movements, after remaining suspended for some time, settles or accumulates on the surfaces of adjacent objects. One most likely way of entry of dust into the occupational environment is the outdoor soil by wind apart from the dust carried by the clothes and foot wear of people who frequently move in and out. House dust has been studied and identified as one of the natural source materials for the algal spores and filaments to inhabit in.

## CONCLUSION

Hence it is concluded that house dust contains variety of algal forms and are responsible for allergenic diseases in human beings. Outdoor soil is the chief contributor to the house dust.

## REFERENCES

- Benaim Pinto, C. (1972). Airborne algae as a possible etiologic factor in respiratory allergy in Caracas, Venezuela. *J. Allergy and clinical Immunol.* 49 :356-358
- Bernstein, I.L. and Safferman, R.S. (1970). Viable algae in house dust. *Nature* 277:851-852.
- Bernstein, I.L. and Safferman, R.S. (1973). Clinical sensitivity to green algae demonstrated by nasal challenge and in-vitro tests of immediate hypersensitivity. *J. Allergy.* 51: 22-28.
- Chougule, P.M. and Andoji, Y.S. (2016). Isolation and identification of house dust microalgae from Sangli district. *Research Journal of Life Sciences, Bioinformatics, Pharmaceutical and Chemical Sciences.* 1(5): 237-240.
- Desikachary, T. V. (1959). *Cyanophyceae: Monographs*, Indian Council of Agricultural Research, New Delhi, 680 pp.
- Fritsch, F.E. (1935). *The Structure and Reproduction of algae*. Vol. I. University Press, Cambridge, 791 pp.
- Fritsch, F.E. (1945). *The Structure and Reproduction of algae*. Vol. II. University Press, Cambridge, 939 pp.

Jadhav Milind and Jain Chitra (2007). Isolation of microalgae from house dust. *Bionano Frontier*. 1(1)74-77.

Lustgraff, B.V.D.(1979). Seasonal abundance of algae and thermophilic fungi in house dust. *Proc.First Int.Conf.on Aerobiol*, Munich. 165-169.

Mittal, A. (1981). Algal forms in house dust samples and their role in respiratory allergy- a preliminary report. *Jr.Asso.Phy.Ind*.29: 197-200.

Rao, K.S. Ramchander and Jadhav, M.J. (1997). Isolation of microalgae from the dust obtained from indoor and outdoor sources. *Proc.Fifth Int. Conf. on Aerobiol*, Bangalore, India, 49-58.

Sarode, P.T. and Kamat, N.D.(1984) Fresh water diatoms of Maharashtra, *Saikrupa Prakashan*, Aurangabad, 338pp.

Singh, A and Talpasayi, E.R.S. (1984). Algal aeroflora from Banaras. In: Recent Trends in Botanical Researches. R.P. Sinha, ed. R. P. Roy commemoration Fund. Patna, 79-81.

Table 1: Distribution of algal forms in house dust samples

Sr. No.	Algal taxa	Number of dust samples
I	CHLOROPHYCEAE	
1	<i>Chlorococcum humicola</i>	19
2	<i>Chlorella vulgaris</i>	17
3	<i>Ankistrodesmus falvatus</i>	05
4	<i>Actinastrum hantzschii</i>	07
II	BACILLARIOPHYCEAE	
1	<i>Cymbella aspera</i>	3
2	<i>Gomphonema sp.</i>	7
3	<i>Nitzschia palea</i>	13
III	CYANOPHYCEAE	
1	<i>Gloeocapsa rupestris</i>	05
2	<i>Gloeothece palea</i>	11
3	<i>Aphanothece nidulans</i>	30
4	<i>Merismopedia tenuisima</i>	09
5	<i>Chlorogloea microcestoides</i>	05
6	<i>Myxosarcina burmensis</i>	10
7	<i>Phormidium abronema</i>	03
8	<i>Phormidium bohneri</i>	03
9	<i>Phormidium jenkelianum</i>	12
10	<i>Phormidium molle</i>	14
11	<i>Lyngbya sp.</i>	03
12	<i>Microcoleus acutissimus</i>	13
13	<i>Microcoleus subtorulosus</i>	05
14	<i>Nostoc linckia</i>	04
15	<i>Nostoc muscorum</i>	09
16	<i>Plectonema gracillimum</i>	15
17	<i>Scytonema bohneri</i>	07
18	<i>Hapalosiphon welwitschii</i>	04
19	<i>Stigonema hormoides</i>	03

Table 2: Allergenic algae isolated from house dust during present study

Sr. No.	Algal taxa	Frequency of occurrence
1	<i>Chlorococcum humicola</i>	++++
2	<i>Chlorella vulgaris</i>	++++
3	<i>Ankistrodesmus falvatus</i>	+
4	<i>Nitzschia palea</i>	+++
5	<i>Gloeocapsa rupestris</i>	+
6	<i>Gloeothece palea</i>	++
7	<i>Aphanothece nidulans</i>	++++
8	<i>Myxosarcina burmensis</i>	++
9	<i>Phormidium abronema</i>	+
10	<i>Phormidium jenkelianum</i>	+++
11	<i>Phormidium molle</i>	+++
12	<i>Microcoleus acutissimus</i>	+++
13	<i>Nostoc linckia</i>	+
14	<i>Nostoc muscorum</i>	++
15	<i>Plectonema gracillimum</i>	+++
16	<i>Scytonema bohneri</i>	++

+ = Minimum, ++ = Moderate, +++ = Maximum, ++++ = Dominant