

Study of Intramural Aeromycoflora of the College Premises

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ABSTRACT

The objective of this study was to know the diversity of fungal flora in the campus environment of the college. In present investigation *Rhizopus sp*, *Aspergillus sp*, *Mucor mucedo*, *Albugo Sp* were found more prevalent in aeromycoflora. Fungal species belongs to Deuteromycetes & Ascomycetes dominated with 37.5% colonies exhibiting highest fungal count followed by Phycomycetes with 25% count. Aeromycoflora was collected by using Petri Plate exposure method on potato dextrose agar. A total of 16 fungi were identified. The present investigation on air borne mycoflora will be helpful in disease forecasting, epidemiology and timely disease management.

Key words: Aeromycoflora, *Rhizopus sp*, *Aspergillus sp*, Ascomycetes, Deuteromycetes.

INTRODUCTION

Aerobiology is a scientific discipline focused on the transport of microorganism and biologically significant materials. Aerobiological studies are widely used to determine the fungal spectrum in the air (Isabel et.al 2012). It is concerned with the sources of organisms or materials, the release in atmosphere, dispersion, deposition and impact on human and plant system. The distribution of fungal air spora in the environment varies from place to place attributed to variation in climate, season, geographical location, vegetation flora combination (Gali, 2014).

Fungal spores originally created from plant, animal and soil sources get airborne during day time particularly in the afternoon, carried to a long distance, suddenly deposits on epidermal region of plant parts and may cause diseases to diverse group of healthy plants. (Z.I.El Gali 2014) (G.N.Agrios, 2005). They are implicated in damage of food commodities, spoilage of stored grains, fruits, foodstuff, in deterioration of organic material and their high concentration of

mycotoxins may cause health hazards. Usually these fungal spores cause no trouble to most of the human population but they can be harmful by provoking allergic responses or infections and cause disorders such as bronchial asthma (significant global public health issue), allergic rhinitis, migraine, urticaria, eczema, and atopic dermatitis and plant diseases.

The study of fungal spores is of high significance due to its role in the field of human allergy, plant diseases (Ellis 1985). Aerobiologists are mainly interested in the entrainment, identification and enumeration of transported biological materials in the atmosphere. Assessment of aeromycoflora is necessary for the control and prevention of fungal diseases so as to protect the human from fungal allergy and to minimize heavy economic losses through spoilage of grains by fungal spores. With the objective to determine the diversity of airborne fungal spores in the environment which will be helpful for further studies on allergy, the aeromycofloral survey was conducted in the campus area of the college.

MATERIAL AND METHODS

Three different locations in a campus area have been selected as sampling site. The samples of different locations were collected on 10 November 2017 on sterile potato dextrose agar (PDA) nutrient medium in Petri plates composed of peeled potato (125 gm/l), dextrose (10 gm/l) and agar (10 gm/l) in distilled water.

Petri dishes containing PDA nutrient medium were exposed in triplicate for 10-15 minutes in the sampling site, in afternoon between 3 to 5p.m. placed at 10 meter height. An exposure time of 10-15 minutes provided to be very suitable, as it gave adequate colony counts. The exposed Petri plates were sealed with cellophane-tape brought them to laboratory and incubated at 25 ± 2 °C in incubator for 3 to 4 days depending upon growth of colonies at alternate cycle of 12 hours dark and light. The developed colonies were counted, isolated and identified.

RESULTS & DISCUSSION

Concentration of air borne fungal spores was measured at the campus area of the college. The PDA plates were kept at about 10 m high from ground level at different locations. Fungal spores were classified by appearance and morphological characteristics (color, size, and shape) and identified by comparing with published keys and monographs (Smith 1990) (Tilak 1989). Fungal spores in our college premises has not been estimated or reported earlier. The total of 16 genera of fungal spores were identified from 78 fungal colonies were listed in the photographs.

Among all the fungal spore types the taxonomic group Deuteromycetes & Ascomycetes showed dominance in the total spore contribution with 37.5% followed by Phycomycetes with 25%. Members of Myxomycetes & Basidiomycetes were absent in the result due to the lack of favorable conditions necessary for their growth & development. The results obtained showed a similar pattern with the previous studies (Sharma et al 2011). The *Rhizopus sp* shows maximum dominance with 15.38 % contribution followed by *Drechylera sp* with 10.25% contribution. *Mucor mucedo* and *Bitrimonospora sp* shows equal level of % contribution in the air which was followed by *Aspergillus sp* and *Phytophthora sp*. Rest of the fungi were present in low concentration. Deuteromycetes or the fungi imperfecti represent the species which have thick spore walls that may promote them to remain viable in the air for longer time which may be the reason of getting more fungi from Deuteromycetes type. Similar results were obtain (Kotwal et al 2010) while studying outdoor aeromycoflora at Nasik.

The objective of the present study was to carry out the survey to determine the diversity of airborne fungal spores in a particular period of time and to estimate the variation in aeromycoflora in the college premises atmosphere. Impact of airborne fungal spores including their release, dissemination, deposition and effect is of great significance to identify the health hazards and physiological disorders in living beings.

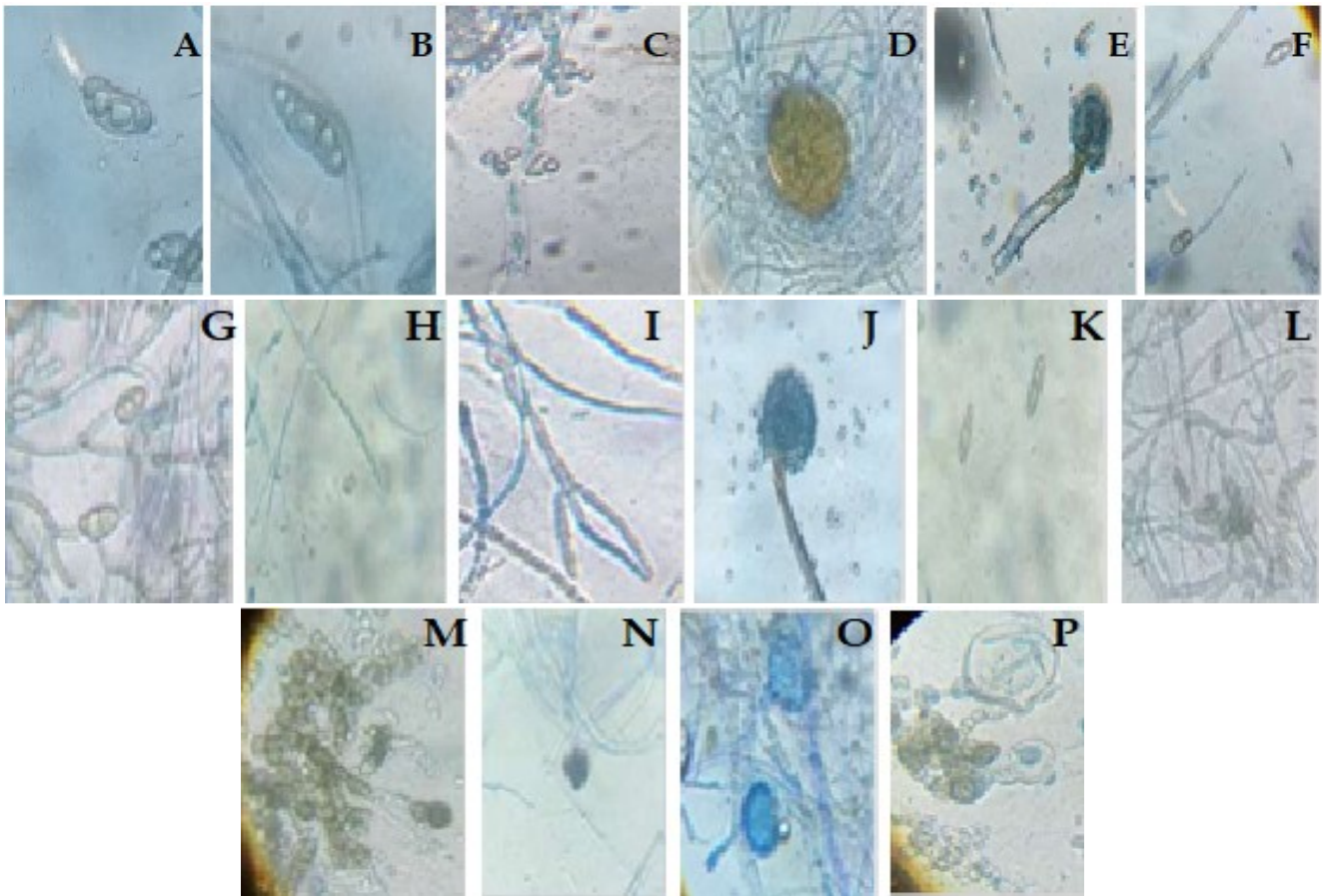


Fig1. Airborne fungi detected in the campus area (A. *Drechylera* sp, B. *Massarina* sp. C. *Aspergillus* sp. D. *Phytophthora* sp. E. *Mucor mucedo* F. *Apiorhyncostoma* G. *Massaria* sp H. *Phaetrichoconis* sp I. *Tetrapola* sp J. *Rhizopus* sp K. *Cordona* sp L. *Pestalotiopsis* sp. M. *Cladosporium* sp N. *Harknessia* sp O. *Bitrimonosporous* sp P. *Albugo* sp.)

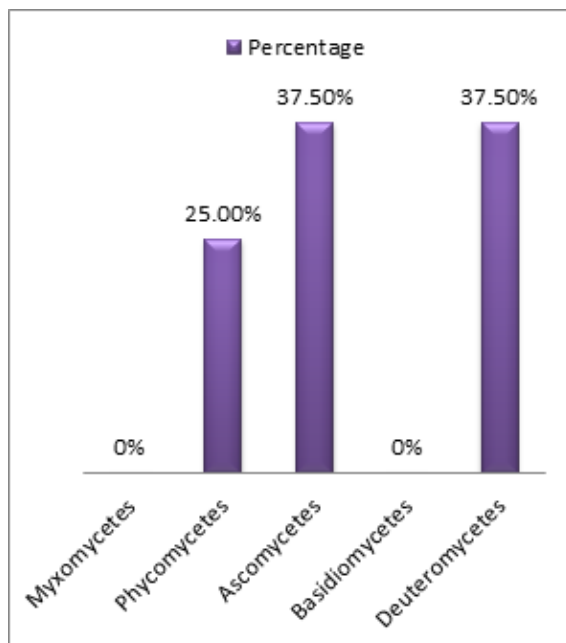


Fig2. Percentage contribution of different class of fungi

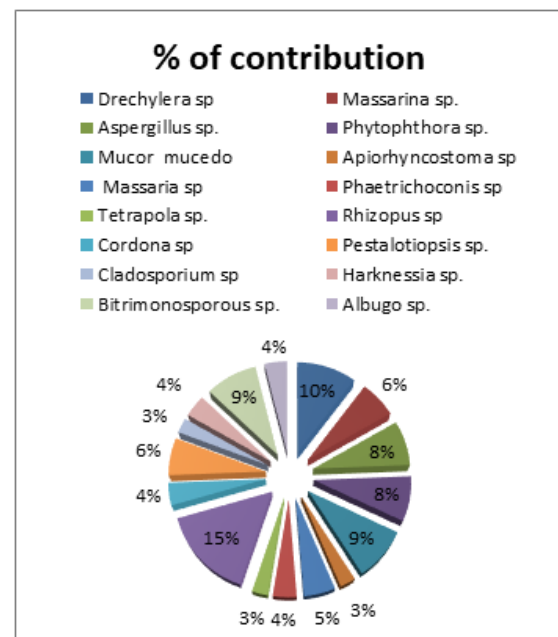


Fig3. % contribution of Aeromycoflora

Study of this aspect is highly interdisciplinary in nature and has tremendous scope to find the significant application in human health and in plants. Exposure to outdoor and indoor airborne inhalant mold allergens develops respiratory symptoms and airway diseases and allergies and at the same time destroys the vegetation which may leads to economic loss. Thus clean environment is of prime importance to reduce the fungal spore load in the air.

In the present study the clear picture of the diversity of fungal spores present in environment of the college during the month of November when the temperature and humidity both were moderate were observed.

CONCLUSION

Environmental micro fungal population is seemed to act as an indicator of the level of environmental biopopulation. In the present investigation aeromycoflora were belonging to Deuteromycetes and Ascomycetes type show maximum, contribution indicating the climate suitable for their growth. Absence of Myxomycetes and Basidiomycetes type indicate absence of crop field in the study area. The airborne fungal spore may provoke variety of respiratory diseases and other health problems. At the same time it may attack plant parts causing diseases in plant system.

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Conflicts of interest: The authors stated that no conflicts of interest.

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