

## RESEARCH REPORT

## Monitoring of aeromycoflora of herbal garden of SIES College of ASC Sion (west) - A case study.

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**ABSTRACT**

Aeromicrobiology is the study of living microbes which are suspended in the air. These microbes are referred to as bioaerosols and also includes various dormant fungal spores. Though there are significantly less atmospheric microorganisms than there are in oceans and in the soil, there is still a large enough number that they can affect the atmosphere. Once suspended in the air column, the fungal spores get an opportunity to travel long distance with the help of wind and precipitation, increasing the occurrence of widespread fungal diseases. There is also an ecological significance as they can be associated with diseases in humans, animals and plants as they settle on surfaces in calm environment. Specially nurtured college herbal garden plants are also subjected to fungal infections. Thus there is a potential threat to medicinal, ornamental, rare and exotic garden species. Spores suspended in air can settle on an agar nutrient medium as it provides readymade nutrients for germination with optimum conditions required for growth, as a result of which fungal colonies are produced which can be further identified well in advance as a part of garden maintenance. A comprehensive aeromycological study was conducted in herbal garden of SIES College of ASC, Sion (west). Present studies revealed presence of *Aspergillus*, *Alternaria*, *Fusarium*, *Pythium*, *Rhizopus* etc and subsequently necrosis in the form wilt, blight, damping off, stem and foot rot were found to be occurred on the leaves of *Ficus elastica*, *Exora*, Papaya etc. Thus, continuous monitoring of aeromycoflora is a crucial step in garden maintenance.

**Key words:** Aeromycoflora, bioaerosols, fungal pathogens, *Alternaria*, *Aspergillus*, *Fusarium*, *Pythium*, *Rhizopus*, necrosis, blight, stem and foot rot, wilting, damping off

**INTRODUCTION**

All samples of air contain some water in the form of vapour or mist along with gaseous mixture and suspended matter consisting of dust, bacteria, yeasts, moulds, pollen grains etc. Air is not a natural environment for the growth and reproduction of microorganisms. It does not contain the necessary amount of moisture and kinds of nutrients that can be used by

fungus spores. The fungus spores when land on a plant can germinate and cause infection. This can cause loss of valuable garden plants and infection also spreads rapidly. In this case, the study of aeromycoflora is considered as the basis of public health, yield and thereby the economy of nation. Being saprophyte, when fungus spores land on exposed agar plates, they germinate as in culture medium, potato provides nitrogen, carbon and vitamins. Dextrose is the source of carbon; Agar is used as solidifying agent. There are very few reports regarding the study of indoor aeromycoflora of occupational environment. Herbal garden of SIES college has been awarded first Prize in 'Best Garden competition' in 2014. It has spread over front and backyard of the college where medicinal, ornamental rare plants are significant and most delicate sections. It is important to study qualitative prevalence of aeromycoflora. Thus, continuous monitoring of aeromycoflora and subsequent preventive measures or control measures becomes crucial aspect of garden maintenance.

## MATERIALS AND METHODS

Nutrient agar plates were prepared in aseptic condition. Different localities from college herbal garden which are far apart were selected for exposing the plates. Thus, sedimentation method of studying the air mycoflora was preferred. The plates were exposed for half an hour. Then covered with lids and incubated at 37 degree centigrade for 48 hours. Wet staining in cottonblue stain was performed. Mycelia were mounted in lactophenol and their colony characteristic, hyphal and spore structures were analysed as basis for identification of pathogens. Garden plants also were thoroughly scrutinized for disease symptoms.

## RESULTS AND DISCUSSION

With respect to observations of colony characters, hyphal structures, reproductive structures, the potential threat of fungus species such as *Aspergillus*, *Alternaria*, *Fusarium*, *Pythium*, *Rhizopus* were identified and subsequent occurrence of necrosis in the form of blight, wilting, stem and foot rot, damping off were observed.

Continuous monitoring of aeromycoflora by sedimentation plate exposed technique is fairly a good precautionary step to avoid opportunistic fungus pathogen attack on fragile garden plants. It will alert local farmers about prevailing pathogenic spores and diseases to be spread in future. The necessary precautionary measures can be undertaken to control spread of diseases in that locality. It is fairly an inexpensive less equipped, simple microbiology technique even can be applied in non-sophisticated labs providing sterile conditions for inoculation of fungus spores.

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