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Title Key: Role of Aeromycoflora in Book …

Role of Aeromycoflora in Book Deterioration of the College Library

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Abstract
The present investigation deals with the study of aeromycoflora of the library of Dr.Rafiq Zakaria college for Women, Aurangabad . A study of airborne fungi was carried out by using viable volumetric sampling methods. During the year 2016-2017 a sampling done at a interval 15 days.The study involves identification and analysis of pathogenic fungal spores. Biodeterioration of books and library materials is commonly caused by fungi. Fungi are specialized microorganisms which differ from the plant kingdom by the lack of chlorophyll and consequently cannot utilize energy directly from sunlight. The destructive role of fungi is due to their hydrolytic enzyme activity. The cellulite activities cause maximum damage to papers as well as binding materials of the books like leather and glue. Fungal spores in the library not only deteriorate and degrade the quality of papers but also cause the health effects like allergy itching of skin and create respiratory disorders to the readers, students and the staff members. The fungi isolated from library books and library material such as Alternaria spp, Aspergillus spp, Cladosporium, Curvularia sp, Chaetomium, Penicillium ,Trichoderma, Rhizopus,Mucor and Helminthosporium were recorded in the experiment. The results were recorded and analyzed and compare with the literature.
Key Words: Aeromycoflora , Biodeterioration, Penicillium and Helminthosporium.

Introduction: Aerobiology is the study of scientific multidisciplinary approach concerned with the source of the airborne microorganisms and their identify behaviour, movements and survival, their release desperation ,deposition, impact on human, animal and plant systems. study on airborne fungi has been conducted in the library of Dr.Rafiq Zakaria college for Women, Aurangabad. Library is rich with over 50000 books, periodicals and daily newspapers ,the library is visited regularly by approximately by 500 students and teaching staff daily. Mold deterioration of library materials in archives and libraries is a frequent and complex phenomenon that may have important economic and cultural consequences. In the recent years, the deterioration of library materials by microorganisms has attracted the attention of many investigators. The role of fungi associated with books or paper materials in library in bringing about their deterioration has been a subject of great interest .The biodeterioration includes foxing ,moisten of papers browning of papers mildewing and rotting of books , in library. The role of biological agents and the deterioration with reference to libraries and museums has been reviewed by many scientists (Greathouse et al. 1954, St. George et al. 1954,Kowalik 1984). Organic materials of papers are susceptible to some species of mold growth. The organic materials in library include cellulosic fiber, book cloths, natural adhesives, including starch paste made from vegetable matter and glues; some synthetic adhesives; leathers etc. In addition, dust and moisture can provide additional nutrients required for

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the normal mold growth. In this Present investigation of study, common fungal species contaminating books and fungal bioaerosols is reported. Indirectly, this type of study may have public health applications, since the calculation of atmospheric fungal content and the identification of certain human pathogens can show whether an atmosphere is healthy suitable or not and point to potential allergy risks which is hazardous . The identification of spore types was based on microscopic characters.

Materials and methods:

In present investigation a study of air-borne fungi was carried out in the college library at different locations containing books shelves and papers stored shelves and contaminated by molds. For detecting aeromycoflora sampling has been carried out by settle gravity culture plate method. PDA Media is used for study . The 9 mm Petri plates containing PDA medium were exposed for 5 minute at different locations in the libraries after slight agitation. Sampling was conducted fortnightly intervals in the morning before the library staff started work after cleaning activities inside the library. Inside the library the air samples were collected from distribution section , reading section, reference book section, stack room (store room), daily newspapers etc. The fungi also isolated from the infested books and other library materials like leather cover, cardboard cover, binding cloths, adhesive etc. Sampling of fungal elements was performed on visible fungal spots by sterile cotton swabs were wiped across fungal spots then transferred to the laboratory in sterile tubes and used for fungal culturing and identification up to species level. After the exposure to air the Petri dishes in library were brought to the laboratory for further investigation in presterilized polythene bags and incubated at 25°C for 5-7 days. Colonies were counted and identified. The identification of colonies was based on their morphological features color, size, shape etc (Gilman 1957, Barnett 1960, Raper and Fenell 1965, Raper and Thom 1968, Smith 1969, Ainsworth et al., 1972, Ellis 1971, Ingold, 1971.

Plate no.1-Recorded Fungi from Library

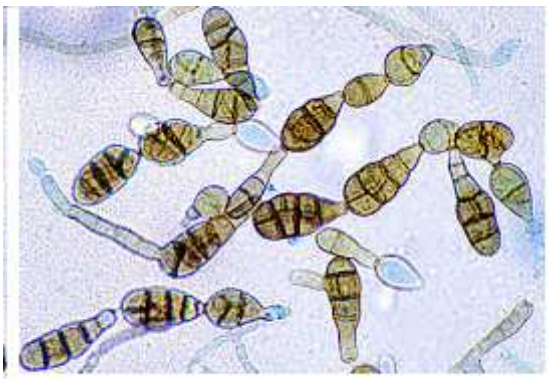

Plate no.2Fungal spore recorded

Results and Discussion:

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From the Plate no.1 and 2 the fungal species were isolated from the air samples that belongs to Zygomycotina, one of Ascomycotina and rest of the colonies were belongs to Deuteromycotina. Non-sporulating and unidentified colonies also counted and grouped under unidentified fungi. In every air samples the spores of Aspergillus were dominant as well as in control samples. Many fungi like Aspergillus spp, Acromonium spp,.Penicillium, Trichoderma, Alternaria spp, *Biospora Corda. Basidiospores Nigrospora*, *Cercospora Fr*. Candidaalbicans,*CurvulariaBoed,ExosporiumLink.FusariumLink.,NigrosporaZimm.*Acromonium,Epicoccum,Cladosporium, Chaetomium, Rhizopus, Mucor, Oidium sp., and Torulla, etc. Were collected not only from the air of library but also from the library materials and most of these fungi are known for cellulose degrading. Superficial fungal infections are chronic and recurring condition. The result of the present study reveals that Aspergillus spp. is the most dominant fungal component of the air in library environment as well in control samples. It seems that the weather conditions like humidity and temperature plays an important role in the development of fungi in the library environment. Most of the filamentous fungi associated with the damage of paper can dissolve cellulose fibres with the action of cellulolytic enzymes, or may discolour the support, dissolve glues and inks or degrade the oil binders. Majority of fungal species have been recovered in the present investigation including the cellulose degrading fungi such as, Fusarium, Trichoderma. Chaetomium, Torula,. After present investigation it is clear that the best remedy is preservation by storage books in the light as well as in well ventilated rooms where the bookshelf kept dry. Regular fumigation with fungicides is also advised for the better maintenance of books in the libraries. It is constantly recommended that for cleaning of the book shelves etc. in the library instead of manual cleaning by hand or duster the use of vacuum pump should be preferred. One of the most important recommendation is maintenance of the proper ventilated building used for library purpose.

Conclusion: The present investigation clearly points out the prevalence of large percentage of allergens inside the library environment, which may be responsible for inducing allergenic reaction to sensitive individuals. Fungal spores in the library not only deteriorate and degrade the quality of papers but also cause the health effects like allergy and allied respiratory symptoms to the readers, students and the staff members.

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