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## Mould Biodiversity of Certain Leaf Surface, Air and Soil Borne Mycoflora

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### ABSTRACT

This review study focuses on mould biodiversity of certain airborne, soilborne and leaf surface mycoflora. Airborne mycoflora can be considered under outdoor and indoor environment, i.e., cold storage, Raipur City, Dwelling houses, *Ocimum sanctum* field whereas soilborne mycofloral study includes Darjeeling tea garden and Yumthang Valley and leaf surface mycoflora of *Ocimum sanctum* and effects of exudates on spore germination also studied. The studies revealed rich biodiversity of moulds in the different environment. Further fluctuation in air and soil fungal flora was observed as influenced by meteorological parameters. *Cladosporium*, *Penicillium* and *Aspergillus* were found to be dominant in most of the aeromycoflora, whereas *Aspergillus niger* found to be dominant in soil.

**Key words:** Dwelling houses, biodiversity, oeromy coflora, spore germination

### INTRODUCTION

There are number of biotic and abiotic components like; pollution, temperature, humidity, actinomycetes, bacteria, fungal spores, algae, insects present in our environment. Microbes get entry into indoor environment through outdoor air current and these are disseminated by the action of wind and cause diseases on human, animals and plant body. Fungal spores make a major part of airspora. It may be originated in the air from different sources such as plant, water, soil and settle down on the suitable host for their growth and development and cause diseases and deterioration on that host. Many scientists made contribution in study of airborne organisms in the different fields. The literature on the occurrence of airborne fungi in the home and work place is extensive including some comprehensive reviews by Levetin *et al.* (1995) and Singh (2007). The present study reviews work done on air and soil mould diversity of certain region of India.

### AIRBORNE MOULD BIODIVERSITY

**Aero mycoflora of cold storage:** Cold storage is mainly used for storage of vegetable, fruits and milk products. These products can be easily store in 2 to 4°C for long term. Fungi are diverse group of organisms and have been found in large amount in the environment. Present study deals with the aeromycoflora of cold storage of Raipur (CG). Sharma and Agrawal (2010) reported 226 fungal colonies and 35 fungal species. The percentage contribution of different classes was as follows, Zygomycotina (5.75%), Ascomycotina (0.88%), Deuteromycotina (83.62%), Unknown fungi (8.84%) and Mycelia sterilia (0.88%). Out of total fungal population *Penicillium* sp. II (13.71%) was most dominated whereas, *Cladosporium cladosporioides* (7.96%), *Aspergillus niger* and *Aspergillus versicolor* (7.52%) were co-dominant fungal species.

**Aeromycoflora of Raipur city:** Aeromycoflora of Raipur city was studied during present study Sharma (2009a) observed 1901 fungal spores. The analysis of airspora indicates the class Deuteromycotina was the highest (91.63%) concentration. It was followed by Oomycotina (4.03%), unidentified group (0.64%) and sterile mycelium (2.84%). The major types of airspora were *Cladosporium* sp. (14.21%), *Aspergillus niger* (11.29%), *Curvularia lunata* (10.96%), *Alternaria* sp. (7.96%), *Fusarium* sp. (5.84%) and *Drechslera* (5.60%), to the total air spora. Higher concentration of spores was observed during August (292) and February (213). Out of total flora *Aspergillus* sp., *Cladosporium* sp., *Curvularia* sp. and *Aspergillus niger* are allergenic in nature.

**Aeromycoflora of dwelling houses:** Intramural aeromycological survey was carried out for 10 dwelling houses at Raipur by Sharma (2009b) during March 2007- Feb. 2008. 22 fungal species were isolated. Maximum in winter moderate in rainy and minimum were observed during summer season. *Aspergillus niger*, *Penicillium* sp., *Curvularia*, *Alternaria* sp. and *Rhizopus* sp. were most frequent while *Fusarium* and *Nigrospora* sp. were least frequent fungal species.

**Aero mycoflora on *Ocimum sanctum* plant:** Sharma and Tiwari (2009a) reported aeromycoflora over *Ocimum sanctum* plant during July 1997 to June 1998. Total 17315 fungal spores represented 43 fungal types were observed during the present investigation period. Out of 43 fungal types 1 from Myxomycotina, 3 from zygomycotina, 10 from Ascomycotina, 2 from Basidiomycotina and 27 from Deuteromycotina were observed. It was also observed that fungal population was varying from season to season and month to month. Environmental factor play an important role for the distribution of the fungal spores.

### **Soilborne mould biodiversity**

**Soil mycoflora of darjeeling tea garden:** Sharma (2010) isolated Mycoflora of soil from tea garden of Darjeeling. Fungal spores recorded were representatives of the three major groups i.e., Zygomycotina, Deuteromycotina (*Anamorphic fungi*) and Mycelia sterilia. A total of 12 fungi were isolated from soil. *Aspergillus fumigatus* (18%), showed maximum percentage contribution followed by *A. niger* and *Rhizopus* sp. (14%).

**Yumthang valley, sikkim:** Isolation of soil mycoflora from Yumthang valley Sikkim was observed by Sharma (2009c) during May 2009. In investigation period colonies of 15 fungal species were observed the maximum percentage contribution of *Aspergillus niger* (25%), was followed by *Aspergillus japonicas* (10%) and minimum percentage contribution of *Trichoderma* sp. *Alternaria alternata*, *Curvularia lunata* (2.5%). The fungal classes observed were Ascomycotina (60%), Deuteromycotina (33.33%) and Mycelia sterilia (6.66%) *A. chartarum*, *A. tamari*, *Nigrospora* sp. and *Cladosporium* sp. (2.27%) were observed.

**Leaf surface mycoflora:** Leaf surface mycoflora of *Ocimum sanctum* plant was studied by Tiwari and Sharma (2008) during July 1997 to June 1998. Total 447 colonies of 33 fungal species (447 colonies) belong to 18 genera of fungi were isolated during the present investigation period. Out of 33 fungal species 01 from zygomycotina, 11 from ascomycotina, 19 from deuteromycotina and 02 from mycelia sterilia. It was observed that fungal population vary from season to season and

month to month. Environmental factor plays an important role for the distribution of the fungal spores.

**Effects of exudates on fungal spore germination:** Apart from the environmental factors, the composition and distribution of the leaf surface mycoflora is influenced by leaf exudates of the plant. Effect of leaf exudates of *Ocimum sanctum* on the spore germination of *Alternaria alternata*, *Aspergillus niger*, *Cladosporium oxysporum*, *Curvularia lunata* and *Nigrospora spherica* are studied. Spore germination of *Curvularia lunata* (62%), *Cladosporium oxysporum* (45%) and *Nigrospora spherica* (40%) are observed in leaf exudates. This is also observed by Sharma and Tiwari (2009b) that *Alternaria alternata* and *Aspergillus niger* failed to germination in leaf exudates.

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