



AEROMYCOLOGICAL STUDY OF WHEAT FIELD

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Abstract: The major part of the global ecosystem is the air that surrounds us. Environmental aero mycology constitutes one of the major aspects mainly because of the dominance of fungal spores in the airspora. Some spores of the fungi are responsible for allergy, since the spores are inhaled and deposited on sensitive mucosa. *Triticum* or Wheat is known for its seeds that are used as food by almost every individual. Many worker work in an agricultural field for the proper cultivation of the seeds. These workers may interact with many fungal spores during their work that may cause several allergy to them. In this present study aeromycoflora was isolated from a wheat field. The isolated fungi was *Alternaria* (41.33%), *Cladosporium* (26.02%), *Mucor* (8.67%), *Penicillium* (8.67%), *Rhizopus* (6.63%), *Fusarium* (4.59%) and *Aspergillus* (4.08%).

Keywords: Wheat, agricultural field, allergy and mucosa.

Introduction:

Wheat is the main agriculture crop in India. The term “agriculture” can be defined as, “the art and science of growing plants and other crops and the raising of animals for food, other human needs for economic gain”. This grain is grown on more land area than any other commercial food. World trade in wheat is greater than for all other crops combined. Globally, wheat is the leading source of vegetable protein in human food, having a higher protein content than other major cereals, maize (corn) or rice.

Aerobiology mainly deals with the airborne particles of biological origin and their effect on living organisms. These particles mainly include viruses, bacteria, pollen grains and fungal spores. The mycoflora concentration in the atmosphere is influenced by the processes involved in their production, release and deposition (Lyon et al., 1984). Airborne fungi are considered to act as indicator of the level of atmospheric bio-pollution (Kakde et al. 2001). About 20% of the human population is easily sensitized by normal fungal spore concentrations (up to 106 spores/m³) and all fungal spores should be regarded as potentially allergenic. Numerous plant diseases such as rusts, smuts, mildews, leaf spots, etc. are caused by air borne fungi (Kendrick 2000). Air borne fungal spores are almost predominant reason for respiratory diseases, allergens and skin diseases and their concentration in the air depends on the environmental conditions. Air borne fungal spores can also cause serious agricultural problems and sometime result in epidemics (Hirst, 1991). Due to inadequate agricultural

facilities the poor farmers find it difficult to control such plant diseases once they are established and even can't protect themselves with the exposure of aeroallergens results in developing allergic diseases.

Material and Method:

The air samples were collected from the wheat fields of a private firm. A total of 7 samples was collected after every 15 days interval from the month of January to April 2015 by using gravity Petri plate method for the isolation of aeromycoflora from a Wheat field. Sterilized Petri plates containing Sabouraud's Dextrose Agar (SDA) media were exposed for 2 minutes at 5 feet height in the sampling site twice a month. The exposed Petri plates were brought into lab and incubated at 28⁰ C for 3-5 days. Fungal isolates were observed and identified on the basis of morphological characteristics, microscopic slide and available published literature.

The Percentage contribution of fungal flora was calculated by the following formula-

Percentage contribution = Total number of colonies of individual species in all the plates / Total number of colonies of all species X 100

Result and Discussion:

The result, indicate that a wide variety of fungal spores are present in the air of Wheat field. A total of 196 fungal colonies were identified which comprises the species of *Alternaria*, *Cladosporium*, *Mucor*, *Penicillium*, *Rhizopus*, *Fusarium* and *Aspergillus*.

The result indicate that *Alternaria* contributed a total of 81 colonies from the seven samples having 41.33% followed by *Cladosporium* 51 colonies contributed 26.02%, *Mucor* 17 colonies contributed 8.67% , *Penicillium* 17 colonies contributed 8.67%, *Rhizopus* 13 colonies contributed 6.63%, *Fusarium* 9 colonies contributed 4.59% and *Aspergillus* 8 colonies contributed 4.08%.



Fig: fungal isolates in SDA



Fig: Pure cultures maintained in test tubes.

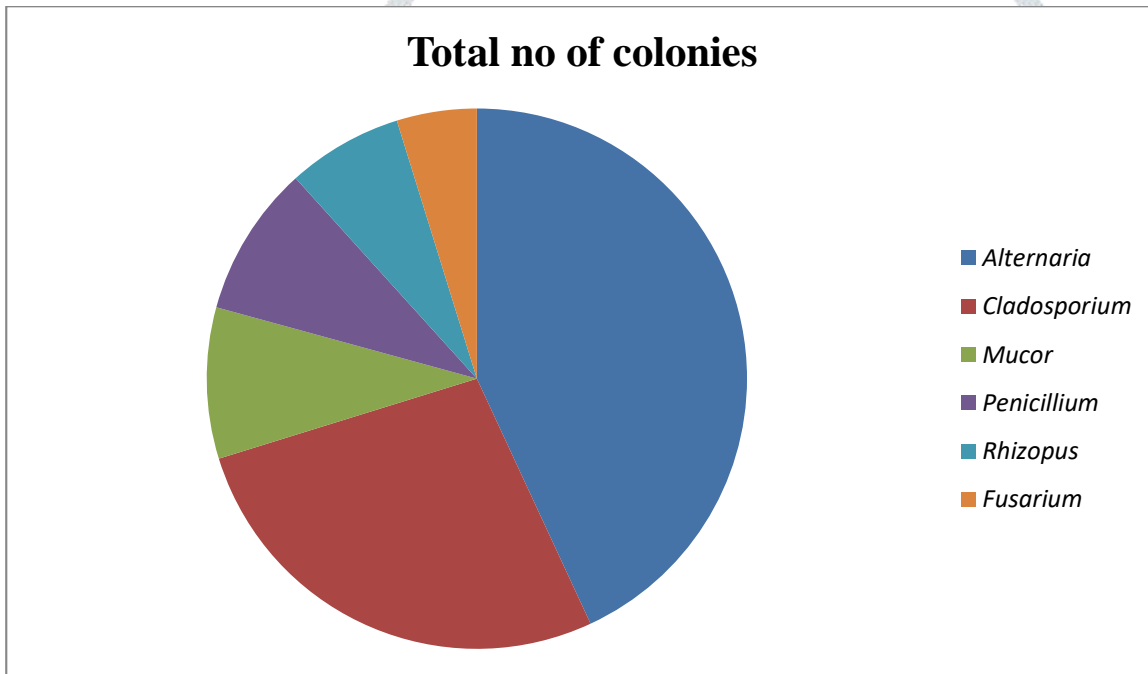


Fig: showing the isolated fungal sp. and its total no.of colonies

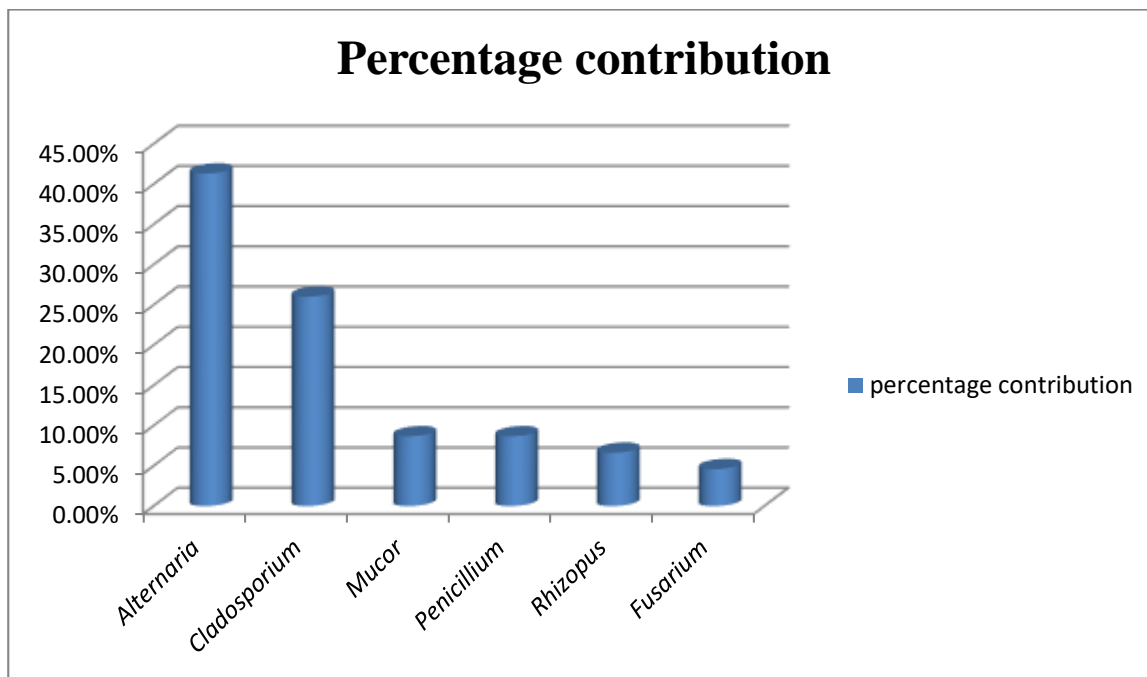


Fig: showing the isolated fungal sp. and its percentage contribution.

Conclusion:

The study of airborne fungal spores is of immense interest due to its applications in the field of human allergy. Many fungal spores were reported from air and their etiology role with relevance to allergic diseases has been discussed and it is concluded that some genera of fungi such as *Aspergillus*, *Alternaria*, *Cladosporium* and *Penicillium* are found throughout the world and they are categorized as allergens.

Salo et al. (2006), studied the exposure to the fungus *Alternaria alternata* is a risk factor for asthma.

Sekulska et al. (2007) reported fungi from air of educational rooms showed dominating contributions of such species of fungi like: *Cladosporium spp.*, *Penicillium spp.*, *Aspergillus spp.*, *Genera Cladosporium herbarum*, *Alternaria alternata*, *Mucor spp.*, *Rhizopus nigricans* and *Epicoccum spp.* These reported fungi are pathogenic and strongly allergenic and can have a bad influence on health.

From the present study it was observed that *Alternaria*, *Cladosporium*, *Mucor*, *Penicillium*, *Rhizopus*, *Fusarium* and *Aspergillus* are present in the air over Wheat field. These all fungi are reported as allergenic previously by many scientists.

These fungi undesirably affects human health and can also affect the wheat field. This research can be done in different way, as to check the effect of this aeromycoflora on wheat crop.

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