

SUMMARY

AND

CONCLUSION

The present investigation deals with the aeromycological studies over wheat and groundnut fields in Karad region (Maharashtra). These crops were specially selected to know the incidence of various fungal spores during the period of cultivation, since wheat crop is important and used as staple food. It contains more proteins, starch, soluble sugars, cellulases and hemicellulases, fats, various minerals like P and Fe, vitamins like thiamin, nicotinic acid, riboflavin and niacin. Groundnut is an important oil seed crop, rich in proteins and vitamins A and B. Being a legume with root nodules, it is capable of fixing atmospheric nitrogen, thereby improving soil fertility. These crops are affected by number of diseases and hence it is studied in detail to know the microbial population and incidence of diseases.

The investigation was carried out by using Tilak's Continuous air Sampler from 1st November 2007 to 15th June 2008. This air sampler was placed at a height of 1 meter above from the ground level in crop field covering an area of two acres. The equipment runs on electric power supply and provides continuous sampling of air for 7 days. The air was sampled on the transparent cello tape coated with petroleum jelly; the tape was changed after every 7 days. Identification of spore catch was made by usual mycological methods.

During the investigation period, the total number of biocomponents trapped was 19,75,553 spores/m³. Total 58 biocomponents were identified including 54 fungal spores and remaining 4 was hyphal fragments, pollen grains, insect parts and scales and unidentified group of fungal spores from the air.

The survey of airborne microbes revealed a total number of 54 components of fungal spore types of which 36 belonged to Deuteromycotina, 14 to Ascomycotina, 4 to other types, 2 to Basidiomycotina and 2 to Zygomycotina group.

During the investigation period, it was observed that spore belonging to Zygomycotina group contributed 4.41% to the total airspora. Ascomycotina contributed 1.85%, Basidiomycotina 16.11%, Deuteromycotina 53.47% and other types 24.16%. Among all these types, the Deuteromycotina group contributed highest percentage contribution followed by other spore types, Basidiomycotina, Ascomycotina and Zygomycotina. Among other types pollen grains contributed high percentage 6.516%, followed by hyphal fragments, unidentified fungal spores and insect scales and parts.

Out of 54 fungal spore types 2 of them were belonging to Zygomycotina which includes *Cunninghamella* and *Sclerospora*.

Ascomycotina group was represented by 14 spore types. Out of these, the spores of genera *Leptosphaeria*, *Teichospora*, *Hysterium*, *Chaetomium*, *Bitrimonospora*, *Melanospora*, and *Sporormia* recorded in high number, contributing 0.576%, 0.360%, 0.316%, 0.201%, 0.088%, 0.078% and 0.066% to the total airspora respectively.

Group Basidiomycotina was represented by smut spores and Uredospores. Smut spores showed high contribution 11.742% as compared to the Uredospores 6.214%. The greater concentration in the smut spores was due to smut diseases occurring in wheat and groundnut fields and surrounding area. Smut spores and Uredospores were found throughout the investigation period.

Deuteromycotina group was represented by 36 different spore types. Their contribution to the total airspora was 53.47% showing highest concentration in the total airspora. During the investigation period, spores of *Nigrospora* shows highest contribution 12.000% to the total airspora, followed by *Alternaria* 11.516%, *Cladosporium* 9.584%, *Epicoccum* 3.239%, *Pithomyces* 3.172% and others were recorded. More spore catch was found in the month of November. Highest percentage of *Alternaria* and *Aspergillus* might be due to decaying of plant material in the vicinity of wheat and groundnut fields.

In this investigation *Emericella*, *Lophiostoma*, *Valsaria*, *Massaria*, *Beltraniella*, *Pleospora* and *Brachysporium* were first time recorded in the atmosphere of Karad region.

The spores of *Alternaria*, *Cladosporium*, *Aspergillus*, Uredospores, *Epicoccum* and *Helminthosporium* were recorded in the atmosphere of Karad region, which are known to cause allergic reactions.

During the investigation period, occurrence of other types such as hyphal fragments, pollen grains, unidentified fungal spores and insect parts and scales were also recorded. Among them pollen grains were showing highest contribution 6.516%, followed by hyphal fragments 6.105%, unidentified fungal spores 2.984% and insect scales and parts 2.566% to the total airspora.

Abundant presence of hyphal fragments was found to be great importance because their viability was recognized to produce colonies in order to cause infection in pathogenic fungi. Their percentage was to be increasing with wind velocity. The significant contribution of fungal fragments was noted during day time. Air borne

hyphal fragments revealed that they mostly belong to *Cladosporium*, *Alternaria*, and *Aspergillus*. Due to their viability, they also serve as means of propagation.

Unidentified fungal spores were found to be changed time to time due to varied atmospheric conditions. These are the group of spores caught on a slide except which could not be included under any of the named group were counted under this category. It is heterogeneous group including several types of spores with changed composition and concentration.

Concentration of spores released was correlated with day to day meteorological data; it was observed that maximum spore catch was found in the month of November and December. Many of the spores recorded during this investigation were found to be responsible for biopollution in the air and biodeterioration. Considerable number of spores were recorded may be responsible for allergic reactions in sensitive human beings and causing various diseases to plants leading to damage in crop fields.

Thus present investigation will help us to understand various biocomponents of air and their occurrence over wheat and groundnut fields in Karad region. It was observed that, the various spore types occurred in relation with weather changes, field operations, crop growth and disease incidence over wheat and groundnut fields during the investigation period.

The study of airspora over wheat and groundnut fields will be helpful in devising disease forecasting system leading to efficient control of diseases. The incidence of pathogenic spores in the present studies will also helpful to farmers and cultivars, so that they can plan for the preventive measures.