

Preliminary Survey of Aeromycoflora of Soybean Field

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ABSTRACT

The investigation of air borne fungi was carried out over Soybean field (Glycinmax L.) at Udgir (MS) in India using Tilak air sampler from 15th June 2016 to 16th October 2016. A total of 57 fungal genera were identified. The most prevalent type of Basidiomycetes spore were Smut spore (1.00%), Uredospore (0.66%), Ganoderma (0.43%) and Telitospore (0.007%). In the present investigation it was evident that the maximum concentration of spores of Basidiomycetes 2.69% to the total air spora was recorded during rainy season. The maximum number of fungal spores (0.78%) was observed in the month of July and minimum (0.2%) in the month of October. The main aim of this study is to find out air spora components in relation to different growth stages and establishing disease forecasting systems.

INTRODUCTION

Soybean (*Glycin max* L.) is one of the important crop of the world. It is extensively cultivated in Marathwada region of Maharashtra state. Madhya Pradesh, Maharashtra, Uttar Pradesh, Himachal Pradesh, Gujrat, Meghalaya, Nagaland, Rajasthan, Sikkim, West Bengal and Arunachal Pradesh are major Soybean

growing states in India. Soybean is rich in protein and also contain good amount of carbohydrate, oil and ash. Soybean oil is used for manufacturing Vanaspati ghee and other industrial product. Soybean is used to control diabetes, nerves diseases, rickets, pulmonary diseases, anaemia, acidity rheumatism and Kidney troubles Kale¹(1985). As Soybean cultivation expanded through out the world diseases have also increased their severity Lakde²(2001). Fungal pathogens play a significant role in causing the disease and decreasing the yield.

Present study deals particularly with the air spora and analysis of pathogenic and nonpathogenic fungal spores over Soybean fields. This study also includes concentration of different spore types, their identification, seasonal variations and diurnal periodicity pattern of some spore types. This investigation will be useful in establishing disease forecasting system for the prevention, avoidance and treatment of Soybean diseases.

MATERIALS AND METHODS

This aerobiological investigation over Soybean crop fields includes qualitative and quantitative analysis of air spora at Udgir. The spore catches were obtained by

operating continuous air sampler³(1970) in Soybean field for a Khariff season from 15th June 2016 to 16th October 2016. Other materials and methods used in the present study are same as described by Tilak and Srinivasulu⁴ (1967). Scanning of slides containing air borne catches was done regularly. The identification of spore types and other biological materials on the exposed tape was done by direct microscopic observation of spore with reference to size, colour, shape and septation. The slides were always scanned under 10X45 eyepiece and objective combination under binocular research microscope. The fungal airspora were identified upto generic level. The confirmation of identity was made by referring standard literature and relevant books of the authors Tilak⁵(1989),Barnet and Hunter⁶(1972),Mukadam⁷(1997), Alexopolus⁸ (1980), Dube⁹ (1978) and Ainsworth¹⁰ (1973).

RESULT AND DISCUSSION

During the air sampling period over Soybean field for a khariff season from 15th June 2016 to 16th October 2016 different air borne components like fungal spores, hyphal fragments, pollen grains, protozoan cyst, insect parts and various microbioparticles were trapped on the cellotape fixed on the drum of Tilak air sampler. In the investigation of Soybean field in all 57 types were recorded of which 51 were fungal spore types and remaining 06 constituted other biological forms. The composition of air spora over Soybean

comprises Phycomycetes 01, Ascomycetes 12, Basidiomycetes 04 and Deuteromycetes 34. The spore types belonging to Deuteromycetes group having highest percentage contribution 72.65% to the total air spora followed by Ascomycetes 13.83%, Basidiomycetes 2.69% and Phycomycetes 0.01% over Soybean field (Table I). Analysis of aeromicrobiota revealed some dominant spore types recorded in descending order. Cladosporium 52.86%, Alternaria 6.10%, Curvularia 7.96%, Torula 4.25%, Sordaria 2.19%, Didymosphaeria 2.14%, Helminthosporium 1.97% and Nigrospora 1.39%. These were the dominant types in comparison with total air spora.

The Basidiomycetes group contributed 04 spore types and ranked third in the order of dominance Table I. The maximum number of Basidiomycetes spore were recorded during the season in the month of July 0.78%/m³ of air. Hirst¹¹ (1957) observed maximum incidence of smut spores in June and July. Pady and Kramer¹² (1960) recorded smut spores through out year with maximum number in June and July. Pande¹³ (1976), Bhalke¹⁴ (1981), Wankhade¹⁵(1983), Patil¹⁶(1985) and Jogdand¹⁷(1987) recorded similar findings. The spores of Basidiomycetes were grouped into Ganoderma, Uredospore, Smut spore and Telitospore over Soybean crop Table II have revealed that moderate temperature, high humidity and rainy days preferably at the flowering stages of the crop favoured the diseased incidence.

Table I

Concentration and percentage contribution of spore group during the period of investigation.

Sr. No.	Spore Group	Total spora	% Contribution
1	Phycomycetes	224	0.01
2	Ascomycetes	134406	13.83
3	Basidiomycetes	41990	2.69
4	Deuteromycetes	1448886	72.65

Table II

Concentration and percentage contribution of Basidiomycetes spore type during the season.

Sr. No.	Spore Type	Concentration of spore	% contribution
1	Ganoderma	7840	0.43
2	Uredospore	11900	0.66
3	Smut Spore	17966	1.00
4	Teliospore	126	0.007

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