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Cercospora Concentration of Soybean Field at Udgir

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ABSTRACT

The present investigation deals with the atmospheric concentration of air borne *Cercospora* fungal spore over Soybean (*Glycin max* L.) field during 20th June 2016 to 15th October 2016 with the help of continuous Tilak Air Sampler. During the period of investigation the aeromicroflora population comprises large number of fungal spores, pollen grains, insect parts etc. Among the fungal spore *Cladosporium*, *Alternaria*, *Curvularia*, *Cercospora* and *Helminthosporium* are responsible for causing number of diseases on Soybean crop. The spore belonging to Deuteromycetes group contributed highest percentage i.e.68.08% to the total airspora. In the investigation *Cercospora* spore concentration was 12138spores/m³ of air recorded during the season. From aerobiological sampling the fluctuation in the concentration of *Cercospora* spores were observed in different growth stages of the crop. It also shows that there is a close relation between cold weather and release of *Cercospora*. The main aim of this experiment is to find out the concentration of *Cercospora* pathogenic fungal spore and their relation with the disease

KEY WORDS – Soybean Field, Aeromicroflora, Tilak air sampler, *Cercospora*.

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INTRODUCTION

Aerobiology is the study of air spora like air borne fungal spore, pollen grains and other air borne micro organisms and their release in to atmosphere, dispersion, diposition and effect on living organism like plants, animals and human beings. According to Edmonds and Benninghoof¹1993 these studies are of great importance to the mycologist, microbiologist, allergologistetc. According to Jacobs²1951aerobiology includes the dispersion of insect population, fungal spores, bacteria ,viruses and pollen grains.Berger³1969has made a successful attempts to forecast Cercospora blight of Celery in Florida by using daily hydro thermograph. In India the credit of pioneering research on aerobiology goes to Cunningham⁴1973 for this aerobiological studies in presidency jail at Culcutta. In Maharashtra aerobiological study was started by Karla and Dumbry⁵1957at Pune. Significant work and development in the aerobiological work in this region was by Tilak and his coworkers have fabricated volumetric continuous air sampler named as Tilak volumetric continuous air sampler.

The study of aerobiology is important in plant pathology and in disease forecasting of plant diseases. There are several factors which reduce the yield of Soybean crop among which fungal diseases are found to be harmful as it reduces quality and quantity of the crops.Leaf spot diseases on Soybean crop are caused by pathogenic fungal spores and their seasonal variation and disease forecasting system for prevention, avoidance and treatment of Soybean crop diseases. Studies on air spora have been well described by many workers⁶⁻⁹.

MATERIALS AND METHODS

The air monitoring over Soybean field was carried out for a kharif season by using continuous Tilak air sampler. The air sampler kept at constant height of 4 feet from ground level with orifice towards west in Soybean field near Nideban village Tq.Udgir Dist. Latur from 20th June 2016 to15th October2016. The rotating drum is removed from the clock motor of the sampler. Cellotape of 1.5cm breadth is fixed around the drum with sticky surface facing the drum on the lines marked.It is coated with a thin layer of petrolium jelly. Now the drum is fixed with the start point'S'. Lid is closed with the help of front knobs provided.Now the sampler is started by putting the electric button on.The sampler can be kept running for a week over adesired crop field like Soybean.After eight days power supply of the sampler is stopped by putting the electric current off.The rotating drum is removed without touching the loaded cellotape.Thecellotape is carefully removed and temporarily mounted on an marked glass sheet. Now it is cut into 16 equqlparts.It is mounted in a glycerine jelly on a clean glass slide.The slides provide day and night data for eight days.The slides were scanned under 10 &45 eyepiece and objective combination under binocular research microscope. The fungal

spores were identified upto generic level. The identification of fungal spore types were done with the help of literature¹⁰⁻¹¹ and also by comparing with the reference permanent spore slide.

RESULT AND DISCUSSION

In this investigation 57 types have been reported of which 51 were fungal spores and remaining were other biological components like fungal hyphae, insect part, pollen grains and Trichomes etc. During the season total number of spores counted 128804 spores/m³. The spores belonging to Deuteromycetes contributed highest percentage 73.74% to the total air spora followed by Ascomycetes 12.08%, other group 8.77%, Basidiomycetes 4.76% and Phycomycetes 0.50%. In this study Cladosporium 14.64%, Aspergilli 11.83%, Alternaria 11.65%, Torula 6.80%, Curvularia 6.47%, Didymosphaeria 6.15%, Sordaria 4.59%, Ramularia 4.32%, Smut spore 2.08%, Pithomyces 2.06%, Chaetomium 1.85%, Helminthosporium 1.72%, Nigrospora 1.63%, Periconia 1.21%, Rust spore 1.08% and Memnoniella 1.07% were found dominant type to the total air spora (Table I). The percentage contribution of pathogenic spore types Alternaria, Cercospora, Curvularia and Helminthosporium were found maximum in the month of October and minimum in the month of September. The concentration of pathogenic spores at Udgir is also reported by Dhaware¹², Lakhe¹³, Meshram¹⁴, Bagwan¹⁵ and Muley¹⁶.

The class Deuteromycetes contributed 31 spore types and various leaf spot diseases causing Alternaria and Cercospora were responsible for initiating the diseases of Soybean. In the investigation Cercospora spore concentration was 12138 spores/m³. Maximum number of Cercospora were recorded 4970 spores/m³ of air in the month of September and minimum 1442 spores/m³ of air in the month of August. The meteorological factors has a pronounced effect on spore liberation and fluctuation in the concentration of pathological spores at different growth stages of the crop. During humid days and intermittent rains the disease incidence was found on more plants corresponding with the increased spore concentration in air. It indicates that wet weather, low temperature and high concentration of air borne conidia were most favourable conditions for disease incidence.

Table 1: The Percentage Contribution of Different Spore Types of Soybean Field.

Sr.No.	Spore types	% contribution to the total air spora
1	Cladosporium	14.64%
2	Alternaria	11.65
3	Torula	6.80%
4	Curvularia	6.47%
5	Didymosphaeria	6.15%
6	Sordaria	4.59%
7	Ramularia	4.32%
8	Smut spore	2.08%
9	Pithomyces	2.06%
10	Helminthosporium	1.72%
11	Nigrospora	1.63%
12	Periconia	1.21%
13	Memmoniella	1.07%

Table 2: The Percentage Contribution of Pathogenic Spore Types Over Soybean Field.

Sr.No.	Spore type	June	July	August	September	October
1	Alternaria	10.96%	7.51%	11.66%	2.29%	23.16%
2	Cercospora	1.13%	1.74%	0.38%	1.61%	0.51%
3	Curvularia	6.44%	3.54%	2.85%	6.40%	12.06%
4	Helminthosporium	1.79%	1.16%	2.42%	0.86%	1.86%

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