



Investigation of Cercospora Fungal Spore Over Vegetable Field

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ABSTRACT

Air sampling was carried out by using Continuous Tilak Air Sampler over vegetable field Tomato (*Lycopersicon esculentum* Mill), Onion (*Allium cepa*) from 27th October 2016 to 18th January 2017 for rabbi season. During the period of investigation the aeromicroflora population comprises large number of fungal spores, pollen grains, insect parts etc. Among the fungal spores Cladosporium, Alternaria, Curvularia, Cercospora, Helminthosporium are responsible for causing number of diseases on vegetable crops. The spores belonging to Deuteromycetes group contributed highest percentage 80.18% to the total air spora. In the investigation cercospora spore concentration was 22834/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. The main aim of this experiment is to find out the concentration of Cercospora pathogenic fungal spore and their relation with the disease incidence.

INTRODUCTION

In the atmosphere many microbioparticles are present called as air spora. These are fungal spore, insect part, pollen grains etc. The study of aerobiology is important in plant pathology and in disease forecasting of plant diseases. Vegetables are important in daily diet and it has richest source of vitamins, proteins, carbohydrates minerals and salts. There are several factors which reduce the yield of vegetable crops among which fungal diseases are found to be harmful as it reduces the quality and quantity of the crop. Leaf spot diseases on vegetable crop are caused by pathogenic fungal spores. Therefore the present investigation has been carried out to understand pathogenic fungal spores and their seasonal variation and disease forecasting system for the prevention, avoidance and treatment of vegetables like Tomato, Onion and Brinjal. Studies on air spora have been well described by many workers¹⁻⁴.



MATERIALS AND METHODS

The air monitoring over vegetable field was carried out by using volumetric Tilak air sampler plate-I. The air sampler kept at constant height of 4 feet from ground level in vegetable field near Nideban village Tq. Udgir Dist. Latur (Maharashtra, India) from 27th October 2016 to 18th January 2017.

The cello tape was fixed over rotating drum of Tilak air Sampler. After operating for one week cello tape was cut into 8 divisions of equal size and mounted in glycerine jelly on a glass slide. The slides were scanned under microscope. The identification of fungal spore types were done with the help of literature⁵⁻⁶ and also by comparing with the reference permanent spore slide.

RESULT AND DISCUSSION

In the present investigation 54 types have been reported of which 48 were fungal spores and remaining were other biological components like fungal hyphae, insect part, pollen grains etc. In the season total number of spores counted 318032 spores/m³. The spores belonging to Deuteromycetes contributed highest percentage 78.53% to the total air spora followed by other group 14.31%, Basidiomycetes 2.15%, Ascomycetes 4.98% and Phycomycetes 0.03%. In this study *Alternaria*, *Cercospora*, *Curvularia*, *Helminthosporium* were found dominant type to the total air spora (Table I) Plate-I. The spore concentration of *Alternaria*, *Cercospora*, *Curvularia* and *Helminthosporium* were found maximum in the month of January and minimum in the month of November (Table II). The concentration of pathogenic spores at Udgir is also reported by Dhaware⁷, Lakhe⁸, Meshram⁹, Bagwan¹⁰ and Muley¹¹.

The class Deuteromycetes contributed 31 spore types and various leaf spot diseases causing *Alternaria* and *Cercospora* were responsible for initiating the diseases of Tomato and other vegetables. In the investigation *Cercospora* spore concentration was 22834 spores/m³ and maximum number of *Cercospora* were recorded 1568 spores/m³ of air in the month of January 2017. The meteorological factors had 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 diseases incidence was found on more plants corresponding with the increased spore concentration in air. It indicates that wet weather, low temp and high concentration of air borne conidia were most favourable conditions for disease incidence.

Thus the present investigation will help to understand various components of air and their occurrence over vegetable field. It was observed that the occurrence of various spore types was in relation with weather changes, field operation, crop growth and disease incidence on vegetables during the period of investigation. It also helps in knowing the disease incidence and disease forecasting system. The incidence of pathogenic spores noted in the present studies is

also of immense help to farmer and cultivators as it would serve the purpose of alarming them of likely occurrence of leaf spot fungal disease so that they may plan for preventive measure.

TABLE I

The percentage contribution of different spore types of Deuteromycetes fungi of vegetable field.

Sr. No.	Spore type	Percentage contribution to the total air spora
1	Alternaria	6.43
2	Annelophora	0.02
3	Aspergilli	22.30
4	Beltrania	0.01
5	Bispora	0.11
6	Botriodiplodia	0.01
7	Cercospora	0.98
8	Cladosporium	31.74
9	Cordana	0.36
10	Curvularia	3.62
11	Deighthoniella	0.02
12	Diplodia	0.19
13	Epicoccum	0.83
14	Fusariella	0.06
15	Fusoma	0.004
16	Haplosporella	0.02
17	Harknessia	0.008
18	Helminthosporium	1.31

19	Memnoniella	0.13
20	Nigrspora	3.69
21	Periconia	0.65
22	Pestalotia	0.04
23	Pithomyces	0.79
21	Pseudotorula	0.02
25	Pyricularia	0.01
26	Ramularia	1.24
27	Spegazzinia	0.98
28	Stemphyllium	0.008
29	Tetraploa	0.03
30	Torula	4.17
31	Trichothecium	0.03

TABLE II

The percentage contribution of pathogenic spore types over vegetable field.

Sr. no.	Spore types	November %	December %	January %
1	Alternaria	5.41	6.60	7.74
2	Cercospora	0.80	0.50	2.03
3	Curvularia	2.96	3.05	5.56
4	Helminthosporium	1.28	1.12	1.65

Plate-I



Tilak Continuous Air Sampler In Tomato Field



Cercospora



Curvularia



Alternaria



Helminthosporium



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