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INVESTIGATION OF HELMINTHOSPORIUM SPORE CONCENTRATION AT UDGIR

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ABSTRACT

Aerobiology is the study of air borne microorganisms like fungal spores, insect part, pollen grains, protozoan cyst and other biological parts. By considering the importance of vegetables for human beings, the investigation deals with the airspora over Onion field at Udgir. Similarly investigation have been undertaken to concentrate more attention on disease incidence by air borne fungal pathogens in Onion (vegetable-perticularly onion, Tomato, Brinjal) field and divicing disease forecasting system. The present investigation deals with the study of microscopic air spora over the Onion (*Allium cepa* L.) (Vegetable) field at Udgir. This study was conducted for rabbi season from 1st November 2017 to 25th January 2018 using continuous Tilak air sampler. In the air sampling 56 airborne components trapped among these 01 belongs to Phycomycetes, 12 belongs to Ascomycetes, 03 belongs to Basidiomycetes, 34 to Deuteromycetes and 06 to other types. The highest percentage contribution of the spore belongs to Deuteromycetes group was 71.76%, Ascomycetes 16.36%, other types 7.85%, Basidiomycetes 3.32% and Phycomycetes 0.71%. In this study Cladosporium was most dominant type among the fungal spores contributed 21.89% to the total air spora and Helminthosporium contributed 4.42% to the total airspora and ranked third from Deuteromycetes group. The airspora studies over Onion fields have contributed to understand the general components of airspora in this region. It also revealed that the occurrence of spores in air correlate with weather condition. The present study will be useful in divicing for disease forecasting system of Onion crop which would help for protecting the crops from infection and disease.

KEYWORDS: Rabbi season, Tilak air sampler, Aerobiology.

INTRODUCTION

Air is the natural environment of microorganisms. The airborne organisms come from different sources i.e. soil, organic wastes, dead and decaying substrata and infected hosts. The present investigation deals with the studies in the airspora over Onion (vegetable-perticularly Onion, Tomato and Brinjal) fields at Udgir for rabbi season from 1st November 2017 to 25th January2020. In India efforts have been made to find out the air spora of many agricultural crop plants but aerobiological investigations on vegetables have not received much attention, though these crops stand next to cereals as humam food. Kulkarni,[1] (1971), Lakhe.[2] (1980), and Bhasale,[3] (1983) has carried out some preliminary investigation about the airspora over the vegetable fields in this region. Nagpurne,[4] (1993) had carried out investigation about the airspora over the vegetable fields at Kandhar.

The vegetables play very important role in the human diat. They are essential for a balanced diat and maintenance of good health. There is greater demand for vegetable from urban population than from rural population hence most of the vegetable required are grown in areas closer to the town and cities. Hence, the vegetables are easily attack by pests and diseases. There fore more attention needs to be given by Indian plant pathologist to the diseases of vegetable crops in the field at harvest, in storage and in market place as basis for developing suitable control measures Bagwan,[5] (2001).

Onion (*Allium cepa* L,) Family-Liliaceae is an important vegetable crop grown in India. Onions have considered to have diuretic properties and beneficial to the digestive tract. It is good for eyes and act as heart stimulant. It has some medicinal properties. India ranks first in the world in area under Onion 3.35 lakh ha and ranks second in Onion production 3.50 million tonnes ICAR Publication,[7] (1998). Total area under Onion cultivation in Maharashtra was in 1990 (90000 ha), 1991 (87000 ha), 1992 (86000 ha) and in 1993(86000 ha). Fungal pathogens play a significant role in causing the diseases and resulting in the losses in yield. Very few aerobiological investigation over this crop has been intensively studied in the region. It is therefore essential to conduct few more air monitoring experiments over these crops in order to trap the pathogenic fungal spores,

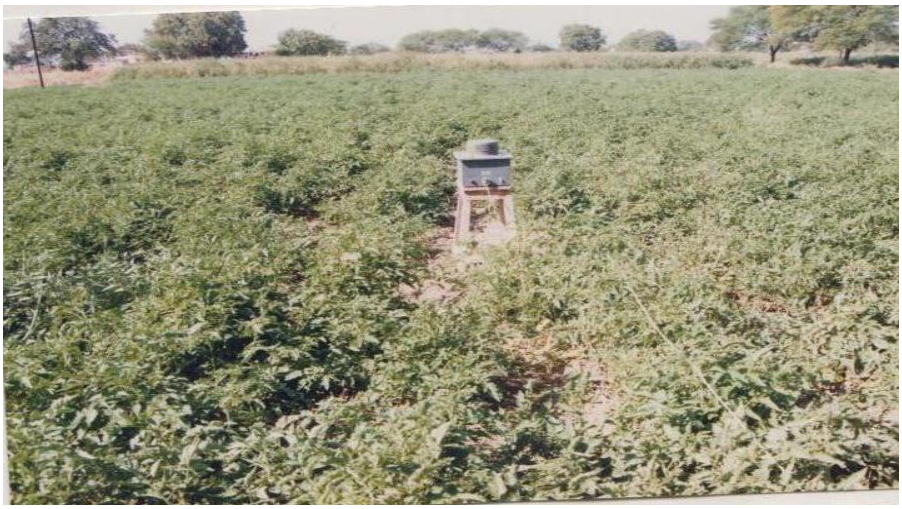
their source, dispersion and impact of meteorological parameters in relation to pathogen.

MATERIALS AND METHODS

The aerobiological investigation over Onion crop fields include qualitative and quantitative analysis of airspora at Udgir. The main aim of this study is to findout airspora components over Onion field in relation to different growth stages and meteorological parameters. Investigation can be carried out throughout day and night or round the clock using continuous Tilak air sampler(plate I) Tilak and Kulkarni,[8] (1970). Tilak air sampler is an electrically operated device. The apparatus provides continuous sampling of air for 8 days. The sampler is a tin box with 10.4"x 8' size. It has an elevated round cap on its lid. The cap contrits an exhaust fan inside. The cap is provided with a netted window for expelling out the internal sucked air. At the bottom of box a clockwise mechanism is fitted. A circular drum is attached on the clock box. The drum rotates in anticlockwise manner when electricity on. The circular outer surface of drum has 16 line mark of equal distance. The front side of sampler is fitted with a pilot lamp of socket for electrical connection and a switch for on and off. Backside of tin box is provided with a small orifice projecting tube through which sucked air enters in the air sampler. As the air rushes in it impings on transparent cellotape of the rotating drum coated with a thin layer of petroleum jelly or transparent Vaseline and thus entraps the bioparticles from the air. It gives continuous 8 days data of various components of air/unit volume/unit time.

The present work of air sampling was carried out for rabbi season by operating air sampler in the centre of the Onion crop fields kept at constant height of 4 feets from ground level with orifice towards west. Permanent slides were prepared by mounting in glycerine jelly. 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 septetion. The confirmation of identity was made by referring standard literature and relevant books of the authors Tilak,[9] (1989), Baret and Hunter,[10] (1972), Mukadam,[11] (1997), Alexopolus,[12] (1980), Dube,[13] (1978) and Ainsworth[14] (1973).

PLATE-I



Continuous Tilak air sampler in Vegetable (Onion) Field.

Curvularia

Cercospora

Helminthosporium

Alternaria

Table I: Concentration and percentage contribution of spore group during 1st November 2017 to 25th January 2018.

Sr. No.	Spore group	Total spore	Percentage %
1	Phycomycetes	140	0.39
2	Ascomycetes	6398	18.93
3	Basidiomycetes	896	2.7
4	Deuteromycetes	25220	70.75
5	Other group	2394	7.23

Table-II: Concentration, percentage contribution and monthwise seasonal concentration of some Deuteromycetes spore during 1st November 2017 to 25th January 2018.

Sr. No.	Spore type	Total spore	Perc. %	Monthwise Seasonal Concen		
				November	December	January
1	Cladosporium	7686	21.89	3738	3290	658
2	Alternaria	5180	14.75	3318	1456	406
3	Helminthoaporium	1554	4.42	532	476	546
4	Cercospora	1498	4.26	532	644	322
5	Curvularia	1484	4.22	644	532	308
6	Nigrospora	1218	3.46	770	308	140
7	Pithomyces	574	1.63	196	266	112
8	Epicoccum	490	1.39	140	238	112
9	Memnoniella	420	1.19	140	126	154

RESULT AND DISCUSSION

The studies in the airspora over Onion (vegetable) field was carried to findout the airspora and disease incidence during rabbi season at Udgir, Dist. Latur Maharashtra from 1st November 2017 to 25th January 2018 using Tilak air sampler. In the investigation of Onion field in all 56 types of spore were recorded of which 50 were fungal spore types and remaining 06 were other biological forms which includes hyphal fragment, insect parts, pollen grains, protozoan cyst and unclassified group. During present investigation the spore types belongs to Deuteromycetes having their highest mean percentage contribution 71.76% to the total airspora, Ascomycetes 16.36%, other types 7.85%, Basidiomycetes 3.32% and Phycomycetes 0.71% over Onion field (Table I). Out of 56 air borne components 01 belongs to Phycomycetes, 12 to Ascomycetes, 03 to Basidiomycetes, 34 to Deuteromycetes and 06 to other types. Total number of fungal spore concentration was 35106 spores/m^3 of air found during the season. The class Deuteromycetes contributed 34 spore types and it is dominant to the total airspora. Cladosporium was the dominant fungus contributed 21.89% to the total air spora followed by Alternaria 14.75%, Helminthosporium 4.42%, Cercospora 4.26%, Curvularia 4.22%, Nigrospora 3.46%, Pithomycis 1.63%, Epicoccum 1.39%, Memnoniella 1.19% (Table II). The pathogenic spore types Alternaria, Cercospora, Curvularia and Helminthosporium were found dominant through out the season (Plate I).Helminthosporium was found third dominant spore type from Deuteromyctes group. Maximum spore concentration of Helminthosporium were recorded 546 spores/m^3 of air in the month of January 2018 and minimum 476 spores/m^3 of air in the month of December 2017.

During the period of investigation total number of Helminthosporium spore contributed 1554 spores/m^3 of air. Bharat Rai,[15] (1969) reported *H.anamalum* Gilmon and about from the exposed petriplate with different media round about *Saccharum munja* Roxb plant at Banarus. Bhasale (1983) reported Helminthosporium spore concentration 1.24% to the total air spora over vegetable field at Aurangabad.

REFERENCES

1. Kulkarni R.L. Studies in airspora over some fields at Aurangabad. Ph. Thesis Marathwadw University, Aurangabad, 1971.
2. Lakhe D.G. Airspora studies over some fields, Ph. D. Thesis, Marathwada University, Aurangabad, 1980.
3. Bhasale S.S. Studies in airspora of Aurangabad, Ph.D.Thesis, Marathwada University, Aurangabad, 1983.
4. Nagpurne S.D. Studies in the airspora at Kandhar. Ph. D. Thesis. Marathwada University, Nanded, 1993.
5. Bagwan Studies in airspora over Vegetable market and post harvest fruit pathology at Udgir.Ph. D. thesis. S.R.T.M.U. Naned, 2001.
6. ICAR Publication 50 years of Horticultural research, 1998; 135-137.
7. Tilak S. T. and Kulkarni R.L. A new airsampler experiment, 1970; 26: 443-444.
8. Tilak S. T. Air borne pollen and fungal spores, Vaijanty Prakashan, Aurangabad, 1989.
9. Barnet and Hunter B. Illustrated genera of imperfect fungi. Burgess publishing company, Minnepollis, Minnesota, 1972.
10. Mukadam D.S. The illustraded kingdom of Fungi. Aksharganga prakashan, Aurangabad, 1997.
11. Alexopolous C.J. Introductory Mycology. John Wiley and Sons, NewYork, London. Sydeny and Toronto, 1980.
12. Dube H.C. Text book of Fungi, Bacteria and Viruses,Vikas publishing House, Pvt.Ltd. New Delhi, Bombay, Benglor, Kolkatta, Kanpur, 1978.
13. Ainsworth G.C. Fungi. Academic press. London, 1973.
14. Bharat Rai Air fungal fiora of Varanasi. Proc. 56th Ind. Sci. Congr. Bot. Sec. Abst, 1969; 113.