

## Studies on Aeromycological Diversity Over Tomato Crop Field in Kharif Season of district Latur

<sup>1</sup>Dr. Chate D.B and <sup>2</sup>Gaikwad M.A.

<sup>1</sup>HOD Deptt. Botany

Mahatma Basweshwar College, Latur.

<sup>2</sup>Corresponding author & Research Student

Mahatma Basweshwar College, Latur.

[gaikwadmanoj205@gmail.com](mailto:gaikwadmanoj205@gmail.com)

Corresponding Author

Gaikwad Manoj Ashokrao

### Abstracts

*Aerobiology is a scientific and multidisciplinary approach focused on the transport of organisms and biologically significant materials. It is concerned with the courses of organisms of material, their release in the atmosphere, their dispersion, deposition and impact on human and animal systems.*

*Aerobiology thus does not simply mean the study of microorganisms in the atmosphere. It also takes into consideration the allergenic properties of various bioparticles like spores and pollen and other bioaerosols.*

*Majority of the plant pathogens which cause diseases are airoborne. Causes in enormous damage to the crop. The information of the pathogen is important about its release, dessimination and spread, infective ability and seasonal variation, it would be ultimately helpful in reducing the crop lossess.*

*The present aeromycological study was conducted in the tomato field at Wadwal Nagnath Tq. Chakur Dist. Latur. In kharif season with the help of volumetric Tilak air sumpler.*

*Total 56 typer of aeroallergen were traped and other groups types i.e. hyphal fragment, Algal filament, pollengrain, insect part and unclassified group.*

*From tomato fields total 56 types aeroallergen were trapedand remaining four types belongs to other group, dominant were Detueromycetes 58.36% Ascomycetes 22.13%, Basidiomycetes 4.86% and Phycomycetes 4.83%.*

**Keywords:** Aeromycology, Air sampler, Glycerine jelly, Tomato field etc.

### Introduction

**A**ir is the mixture of different gases; it consists of number of different particles suspended in it. fungal spore, pollen grain, insect part, bacteria, viruses, dust particles etc.

Diversity of them depend on environmental condition, environment is dynamic which changes time to time and place to place.

According to their impact also changes resulting development of disease in surrounding crop fields.

Fungal spores are dominant in the environment which result in development of different diseases, severe plant diseases of the crop plants are due to pathogenic fungal bioaerosols, ultimately which causes the reduce crop yield.

Aerobiology is scientific approach which deals the study of transport of micro-organisms and biologically significant materials. It is study of sources of organisms or materials, their release in atmosphere, dispersion, deposition and impact on plant, animal and human.

Tomato is very important crop in India. Which is cultivated throughout the year. Tomato introduced in India from the west. Its cultivation and production is in very large scale.

Tomato also very use full as commercial purpose it is source of mineral and vitamin. It also consist lycopene. Useful in the gastric disorders. Ingredient of tomato used in cosmatic products.

Tomatoes are rich in antioxidant lycopene helpful for reduce risk of heart disease and Cancer, it is also source of vit. C Potassium and vit. K.

Tomato crop get infected by various diseases out of which fungal diseases are dominant.The

diseases due to air borne pathogens are stood a challenge for agriculture practices.

The study of Air borne pathogens, aeroallergens over tomato crop fields ultimately helpful to develop a better and efficient forecasting system. In india aerobiological investigation was carried out by number of workers at different research center. Cunningham (1863)[1], Padmanabhan (1953)[2], Ramlingam (1966)[3], Sreeramalu (1970)[4].

Some researchers completed their work on aerospora over tomato fields are Singh N. I. and Devi S.P. (1989)[5], Mesharam B.M (1990)[6], Muley J. R. (2002)[7], Patel S.I. (2008)[8], A.H. Wani (2011)[9].

**Material and Methods**

The present Aeromycological survey were completed with the help of continuous volumetric Tilak air sampler (Tilak and Kulkarni 1970). Install in the tomato crop field in kharif season (June 2016 to Oct. 2016)

The Tilak air sampler is electronic device runs on 230 volt. It consist a rotating drum which complete one rotation in 8 days. Consist cellotape coated with petroleum jelly, cellotape cut into sixteen equal pieces, each onemounted on slide in glycerin jelly. Identification of fungal bioaerosols done on the basis of spore morphology, spore character, permanent slide, available literature.

During the period aeromycological survey the metrological conditions i.e. temperature, rainfall, relative humidity were noted.

**Result and Discussion**

In the present study total 56 type of air borne particles were trapped and remaining four types belongs to other group i.e. hyphal fragment, algal filament, Insect part, poll garn and unidentified group.

Dominant were Deuteromycetes (32); 58-36 %, (16) Ascomycetes 22.13%, Basidiomycetes (3), 4.86% and (5) phycomycetes 4.83% .

The spore belongs from phycomycetes. Contributed few types recorded during rainy season, when the humidity was high and temperature was low.

*Albugo*, *Cunninghamella*, *Rizopus*, *Mucor*, *Phytophthora* were the main components of phycomycetes.

The spores belonging to the group phycomycetes knows as “Wet Spora”. The spore concentration were maximum when humidity 90-95% and temperature 25 - 27°C. The spore *Cunninghamella* exhibit “Nocturnal” pattern.

The spore type belongs to Ascomycetes commonly known as sac fungi spore released when moisture is available corresponds whity rainy season. When ascocarp is wetted by rain or dew. The spore of Basidiomycetes which commonly know as club fungi found in large scale when moisture is available.

The cool, windy and dry periods are responsible for heavy spore load in the air.

The spores of Deuteromycetes, were the abundant in the environment and contributed dominant in the air-spore countered more or less throughout the study period known as day spora.

**Result given in the table I**

Table: Showing spore concentration / m<sup>3</sup> of air and % contribution over tomato field.

Sr. No.	Spore Type	Spore Con./m <sup>3</sup>	%	Concentration
<b>Phycomycetes</b>				
1	<i>Albugo</i>	728		0.65
2	<i>Cunninghamella</i>	1022		0.92
3	<i>Rhizopus</i>	1610		1.44
4	<i>Mucor</i>	1288		1.15
5	<i>Phytophthora</i>	742		0.67
	Total	5390		4.83
<b>Ascomycetes</b>				
1	<i>Ascospore</i>	714		.64
2	<i>Cheatomium</i>	1512		1.36
3	<i>Claviceps</i>	952		0.85
4	<i>Didymosphaeria</i>	2940		2.64
5	<i>Erysiphae</i>	1652		1.48
6	<i>Hypoxyton</i>	1988		1.78
7	<i>Hysterium</i>	2086		1.87
8	<i>Lacaniidion</i>	546		0.49
9	<i>Lophiostoma</i>	2030		1.82
10	<i>Melanospora</i>	2058		1.84
11	<i>Pleospora</i>	1442		1.29
12	<i>Rosellinia</i>	1568		1.41
13	<i>Sordaria</i>	1540		1.38
14	<i>Sporomia</i>	1694		1.52
15	<i>Teichospora</i>	658		0.59

<b>16</b>	<i>Xyluria</i>	1302	1.17
	Total	24682	22.13
<b>Basidiomycetes</b>			
<b>1</b>	<i>Basidiospore</i>	1792	1.61
<b>2</b>	<i>Rust spore</i>	2114	1.90
<b>3</b>	<i>Smut spore</i>	1512	1.36
	Total	5418	4.86
<b>Detueromycetes</b>			
<b>1</b>	<i>Alternaria</i>	4620	4.14
<b>2</b>	<i>Aspergillus</i>	2744	2.46
<b>3</b>	<i>Bispora</i>	1918	1.72
<b>4</b>	<i>Cercospora</i>	2688	2.41
<b>5</b>	<i>Cladosporium</i>	3696	3.31
<b>6</b>	<i>Collectotrichum</i>	2842	2.55
<b>7</b>	<i>Coryneospora</i>	2548	2.28
<b>8</b>	<i>Curvularia</i>	3220	2.89
<b>9</b>	<i>Drechslera</i>	2156	1.93
<b>10</b>	<i>Diplodia</i>	1736	1.56
<b>11</b>	<i>Dicoccum</i>	1148	1.03
<b>12</b>	<i>Exosporium</i>	1568	1.41
<b>13</b>	<i>Excipularia</i>	826	0.74
<b>14</b>	<i>Fusariella</i>	658	0.59
<b>15</b>	<i>Fusarium</i>	1428	1.28
<b>16</b>	<i>Harknessia</i>	756	0.68
<b>17</b>	<i>Helminthosporium</i>	3584	3.21
<b>18</b>	<i>Heterosporium</i>	1260	1.13
<b>19</b>	<i>Hirudinaria</i>	2226	2.00
<b>20</b>	<i>Memoniella</i>	2142	1.92
<b>21</b>	<i>Nigrospora</i>	2534	2.27
<b>22</b>	<i>Periconia</i>	2576	2.31
<b>23</b>	<i>Pithomyces</i>	2170	1.95
<b>24</b>	<i>Pseudotorularia</i>	2114	1.90
<b>25</b>	<i>Pestalotia</i>	868	0.78
<b>26</b>	<i>Pyricularia</i>	1456	1.31
<b>27</b>	<i>Penicillium</i>	2198	1.97
<b>28</b>	<i>Spegazzinia</i>	560	0.50
<b>29</b>	<i>Sporidesmium</i>	2338	2.10
<b>30</b>	<i>Stemphylium</i>	1834	1.64
<b>31</b>	<i>Torula</i>	1666	1.49
<b>32</b>	<i>Tetrapola</i>	1022	0.92
	Total	65100	58.36
<b>Other Group</b>			
<b>1</b>	Algal Filament	2310	2.07
<b>2</b>	Hyphal Fragments	2996	2.69

<b>3</b>	Insect part	1246	1.12
<b>4</b>	Pollen grains	2212	1.98
<b>5</b>	Unclassified	2198	1.97
	Total	10962	9.83
	Grand Total	111552	100.00

**References**

1. Cunningham D.D: Microscopic examination of air Govt. presidency juils of Calcutta. 1873;58
2. Padmanabham S.Y: Specialization in pathogenicity of helminthosporiumoryzae proc. 40<sup>th</sup> Indian Sci. Congr. 1953;(1);18.
3. Ramalingam A: A volumetric survey of the atmospheric pollen over paddyfield at Visakhapatnam in 1960 and 1961. Palynol. Bull; 2 and 1966; 3:11-17.
4. Sreeramulu T.: Conidial dispersal in two species of cercosporycavising Tikka Leaf spots on groundnut. (Arachis hypogea). J. Agri. Sci. 1970; 173-178.
5. Singh N. I and Devi S.P. Aerobiology and crop disease in Manipur VI Fungal air spora over a tomato field in Imphal district. 6<sup>th</sup> Nut. Aerobiol. Conf. Abs. 1991: 14.9.
6. Meshram B.M: Studies in air spora at udgir. Ph.D Thesis Marathwada University Aurangabad 1990.
7. Muley, J. R. 2002. Fungal airspora of Tomato field and epidemiology of its foliardiases, Ph.D. Thesis, Swami Ramanand Teerth Marathwada University, Nanded.
8. Patel S.I. Effect of Rainfall on dissemination of airborne cladosporium link. Spores over Tomato fields at Nashik (M.S). India, Geobios 2008; 35: 233-236.
9. A.H. Wani. An overview of the fungal rot tomato. Mycopath 2011; 9(1) : 33-38.
10. Aher SK, Dhawale V.P, Baviskar PS. Qualitative assessment of air borndenterospores over pomegranate(punicagranatum L.) Field at parner, Ahemednagar district. Maharashtra. International Journal of life Sciences, special Issue 2015; A-3: 18-20.
11. Nagpurne S.P: Studies in airspora at kandhar. Ph.D Thesis, Mahathwada University Aurangabad. 1973.
12. Tilak S.T. Aerobiology and its practical applications proc. I. Nat. Conf. Envirn. Bio.1982; 33-38.