

Studies on Airborne Mycoflora of Groundnut Field in Renapurtehsil of Latur District

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Abstract: The study of airborne fungus spores, pollen, and other aerobic microorganisms, as well as their dispersal, accumulation, and impacts on creatures like plants, animals, and people, is known as aerobiology. To prevent crop diseases, it is also helpful to build a component of air spores in the area and a disease prognosis model. The current aerobiological experiment was conducted in the Latur district's Renapurtehsil. Utilizing a tilak volumetric air sampler to capture aerospores in the study area, an aerobiological experiment was conducted. The current study aims to investigate the population of microorganisms found in the surrounding air in a groundnut field during the monsoon season.

Keywords: Airborne Mycoflora, Groundnut, Renapur

I. INTRODUCTION

Peanut (*Arachis hypogaea* Linn.) is a Fabaceae family annual plant. It is a major oilseed crop in many tropical and subtropical areas across the world. In terms of area and production, India leads the world. Depending on the species and agricultural conditions, seed oil content ranges from 44% to 55%. Its oil is commonly used to make vegetable ghee. It is also used in the production of soaps, cosmetics, and lubricants. Proteins and vitamins A and B are abundant in oils. Because it is a legume with root nodules, it can stabilize nitrogen in the atmosphere, boosting soil fertility. The atmosphere is made up of a variety of gases, vapours, dust, and occasionally pollen grains and other temporary microbes, including bacteria, viruses, and fungal spores. All of them end up being important elements of our environment, and when these aerobic biological particles are present in the air, they create bioerosols. The main source of harmful illnesses in crop plants is fungus spores. Aerobiology is a multidisciplinary scientific approach that focuses on the delivery of biologically relevant materials. The peanut crop is vulnerable to aerial illnesses brought on by many types of soil, seeds, fungi, viruses, bacteria, and nematodes. As a result, there is a reduction in kernel production and a reduction in the quality of the fruits.

II. MATERIALS AND METHODS

The Tilak volumetric air sampler, a specially designed tool, is used to carry out the current experiment. It continuously collects qualitative and quantitative aerospore data for research. This electrically powered apparatus has an inner revolving drum. Cellophane tape with a petroleum jelly coating for aerospore sticking was wrapped around a revolving drum. One full spin of the drum takes seven whole days. One complete rotation of cellophane tape, divided into 14 equal sections, shows 12 hours of day or night on a single piece of the tape. For future spore scanning and identification, a permanent slide was created.

The present investigation of groundnut (*Arachis hypogaea* L.) was grown on JL24's 1.62 hectare for the purpose of this study. Air samples were taken seven days prior to sowing groundnut seeds in the experimental field, and they continued for seven days. The land area was dedicated for one consecutive monsoon season of groundnut cultivation from 17th June 2017 to 5th October 2017, even after the same was harvested. The Meteorological Department in Latur provided daily meteorological data on temperature, relative humidity, and rainfall.

Table 1.1: Total aerospore concentration and their percentage during 17th June 2017 to 5th October 2017

Sr. No.	Type of Spore	Spore concentration during monsoon session (17 th June 2017 to 5 th October 2017)	
		Spores Concentration /m ³ of Air	Percentage Contribution Air Spora
Phycomycetes			
1	Albugo	269	0.013
Ascomycetes			
1	Bitrimonospora	584	0.029
2	Chaetomium	7784	0.387
3	Didymosphaeria	39581	1.967
4	Erysiphae	914	0.045
5	Hypoxyton	321	0.016
6	Leptosphaeria	34852	1.732
7	Lophiostoma	102	0.005
8	Pleospora	3984	0.198
9	Pringsheimia	327	0.016
10	Sporomia	15923	0.791
11	Sordaria	39815	1.979
12	Xyeria	201	0.010
Basidiomycetes			
1	Ganoderma	7924	0.394
2	Rust Spore	12185	0.606
3	Smut Spore	18364	0.913
4	Teliospore	184	0.009
Deuteromycetes			
1	Alternaria	112580	5.595
2	Annelophora	169	0.008
3	Aspergilli	11834	0.588
4	Beltrania	509	0.025
5	Bispora	657	0.033
6	Botryodiplodia	23	0.001
7	Brachisporium	0	0.000
8	Ceratophorum	0	0.000
9	Cercospora	231850	11.523
10	Cladosporium	945984	47.015
11	Cordona	1354	0.067
12	Curvularia	142958	7.105
13	Deighthoniella	56	0.003
14	Diplodia	4451	0.221
15	Epicoccum	13847	0.688
16	Fusariella	694	0.034
17	Fusoma	1187	0.059
18	Haplosporella	6024	0.299
19	Harknessia	465	0.023
20	Heminthosporium	35471	1.763
21	Heterosporium	202	0.010
22	Memmoniella	6809	0.338

23	Nigrospora	25136	1.249
24	Periconia	18471	0.918
25	Pestalotia	65	0.003
26	Pithomyces	17253	0.857
27	Psedotorula	503	0.025
28	Pyricularia	841	0.042
29	Ramularia	20135	1.001
30	Spegzzinia	4954	0.246
31	Stemphyllium	61	0.003
32	Tetrapola	304	0.015
33	Torula	76526	3.803
34	Trichothecium	4282	0.213
Other Types			
1	Fungal Hypha	90106	4.478
2	Insect Part	3718	0.185
3	Pollen Grain	40684	2.022
4	Protozoan Cyst	2041	0.101
5	Trichome	561	0.028
6	Unclassified Group	6028	0.300
	Total	2012107	100

III. RESULT AND DISCUSSION

An aerobiological survey of a groundnut field was conducted in Renapur Taluka, District Latur, Maharashtra, primarily to evaluate the general component of airspace. The crop seedling growth phases and groundnut disease epidemiology have been studied during this investigation, as have meteorological data such as temperature, rainfall, and relative humidity of the aeromicrobiota on the groundnut field. 57 spore types were found during the aerospora investigation, including 12 Ascomycetes, 34 Deuteromycetes, 01 Phycomycetes, 04 Basidiomycetes, and 6 miscellaneous species. Deuteromycetes outperformed all other groupings, contributing an average of 83.773% to the total airspace. Other types (7.114%), Ascomycetes (7.175%), Basidiomycetes (1.922%), and Phycomycetes (0.013%) followed. The Chaetomium member of Ascomycotina contributed 3.387% conc. / m³. To the total airspora in the crop area and Smut spores are related to Basidiomycotina of contributed 0.913% conc./m³. It shows a rise in the number of diseases that have been reported. For producers, this is a worrying situation. Alternaria, Cercospora, Carvularia, and Helminthosporium are some of the pathogenic spore types. Rust spores appeared in high focus and underwent careful examination.

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