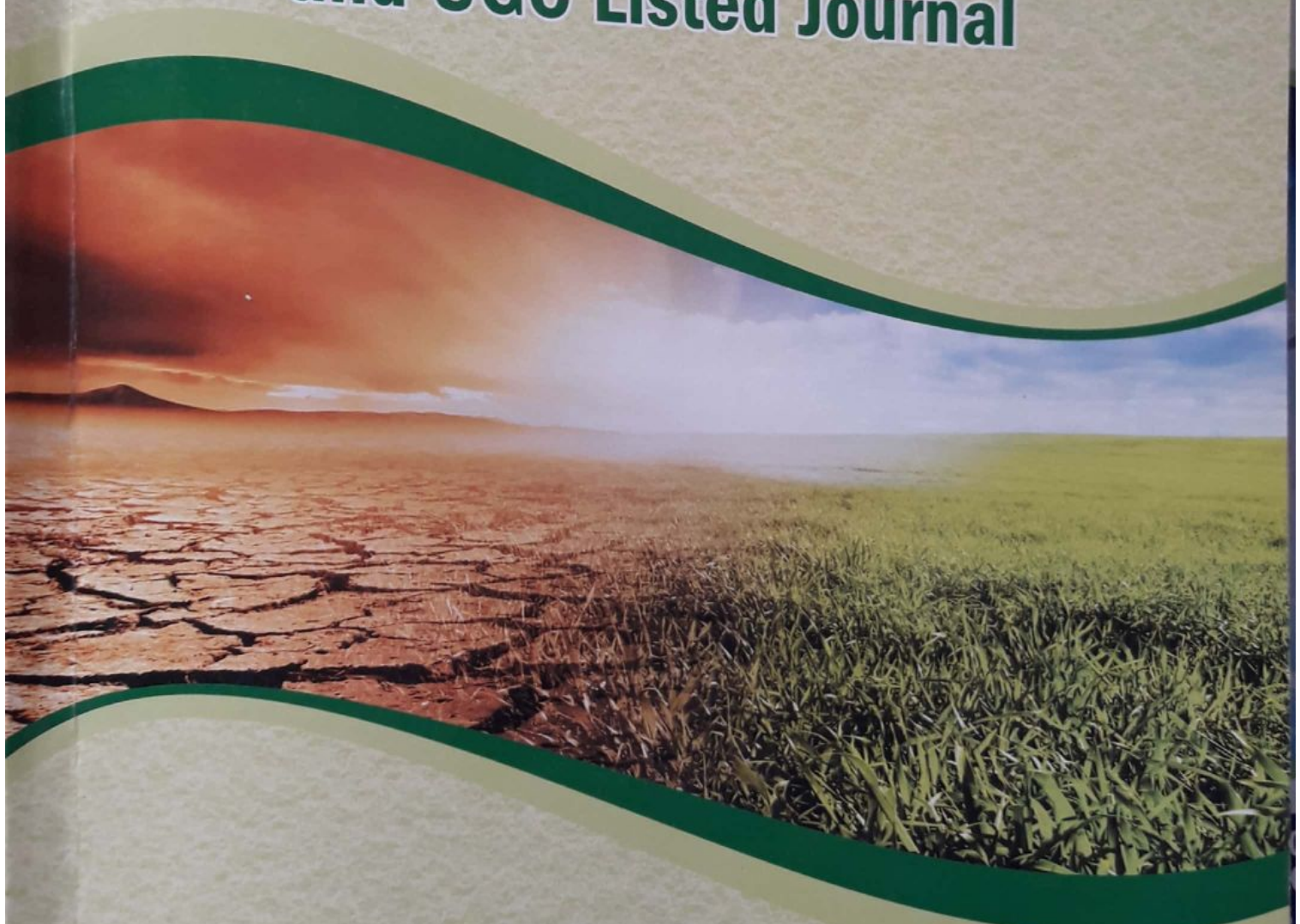


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CONTENTS OF PART - I

Sr. No.	Name & Author Name	Page No.
1	Impact of Climate Change on Agriculture Prin. Dr. Nitin Ghorpade Prof. (Dr.) Aftab Anwar Shaikh Mr. Mandar Umakant Brahme	1-7
2	Impact of Climate Change on Sports Dr. Basavaraj M. Wali	8-15
3	Technology with Overview of Advanced Payment System Sanjay Prabhakar Deshpande	16-28
4	Mangroves Plantation for Conservation and Sustainance of Environment Dr. Khan Zeenat Muzaffar	29-33
5	Indian Economy in Climate Change Dr. Mohit B. Kamble	34-36
6	Regulating Pollution - A Political Economy Model Dr. Akbar H. Saoudager	37-40
7	Influence of Environmental Factors on population Builds up of Polyphagotarsonemus Latus (Banks) Infesting Chilli Monika Jangra Rachna Gulati Sonika V. K. Batra	41-47
8	Investigation of Aeromycoflora of Vegetable and Fruit Market by Petri Plate Expose Method Shafa Khan Sumia Fatema	48-52
9	A Study on the Effect of Temperature and Relative Humidity on the Population and Breeding Biology of Raoultella Indica Hirst (Acari: Tenuipalpidae) Prabheena P. Ramanin	53-67
10	Avifauna at Loutulim Wetland in Zuari Estuary of Goa, India Carmina Priscilla Alves Minal Desai	68-73

8

Investigation of Aeromycoflora of Vegetable and Fruit Market by Petri Plate Expose Method

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Abstract

Aerobiology is an interdisciplinary science of applied significance. The fungal spores in the atmosphere are considered to be most important biopollutant which incite the disease to crops, humans health fruits and vegetable deterioration and air pollution. Aerobiological investigation of **vegetable and fruit market** was conducted during July 2012 to June 2014 to identify fungal spores which are allergenic nature in air causing allergic diseases in human beings, vegetable and fruit deterioration and air pollution. The atmospheric Air of vegetable and fruit market environment contains variety of fungal spores transported through air current are the main source of human allergic, vegetable and fruit deterioration and air pollution. The fungal spores are toxic and responsible for causing serious health hazard diseases in human beings and create lot of environmental pollution in the entire surrounding of vegetable and fruit market. Total 20 fungal spores were recorded. *Aspergillus*, *Curvularia*, *Cladosporium*, *Fusarium*, *Mucor*, *penicillium*, *Candida* and *Alternaria* were found present in almost all seasons throughout the entire study periods which are known to be the major Allergic and causes Sinusitis, Rhinitis's, Asthma, Eczema, Dermatitis, Mycoses, Urticaria. The Present investigation proved that Shopkeepers, Visitor, and children's are exposed to fungal spores in market environment which are Allergic and pathogenic in nature and may causes serious health hazards problems in them, vegetable and fruit deterioration and air pollution therefore cleanness should be maintained.

Keywords: Aeromycoflora, Fungal spores, Allergic diseases.

Introduction

Atmospheric pollution is one of the most serious problems and in recent times it has reached its climax which poses a great threat to human health that deteriorates well being of the population. Air pollution is the introduction of particulate matter, chemicals and biological materials into the atmosphere that causes discomfort, diseases or even death to humans, damage to other living organisms including food crops. Exposure to bio-aerosols, containing airborne microorganisms and their by-products, can result in respiratory disorders and other adverse health effects such as infections, hypersensitivity and toxic reactions. Microbes are the basic sources

of air contamination. Microbial damage in indoor or outdoor areas is caused most frequently by molds and bacteria. Human beings, market commodities are exposed to greater risk air environment because confined areas contained aerosols and allow them to develop an infectious level. Air of market contains a variety of microbial population. Nosocomial infection also known as market acquired infection is infection acquired in a market environment, which was not present in the visitor at the time of admission. Nosocomial infections can cause urinary tract infections, severe pneumonia and infections of other parts of the body. The microorganisms implicated can enter the body through wounds, catheters as well as by inhalation. In the tropics, researchers have identified microorganisms such as *Penicillium* sp, *Aspergillus* sp and *Cladosporium* sp are some of the most commonly isolated microorganisms from market environments. The measurement of the quantity and aeromicroflora types serves as an index for cleanliness of the environment as well as profile revealing human health and nosocomial infections. The source and spread of microorganisms inside the market are of important concern. This present study was aimed at investigating the types of airborne micro-flora of a market in Beed District Maharashtra, India.

Materials and Methods

This work was carried out at vegetable and fruit market of Beed District Maharashtra, India. Different sites of the market were selected for sample collection. These sites were the vegetable shops, fruit shops and open place.

Isolation of Aeromycoflora

For isolation of aeromycoflora, PDA media (Potato Dextrose Agar) was used. Aeromycoflora of the given area was observed by gravity settle plate method containing PDA medium. Ten sterilized Petri plates containing PDA media were exposed 5 to 10 min. in the study area after the interval of fifteen days throughout the study period. These exposed Petri plates were brought in to the laboratory and incubated at 28 ± 1 °C for 3-7 days. After three days of incubation, the fungal colonies were counted for individual species and the total number CFUs were calculated. Microscopic slides stained with cotton blue were prepared from each CFUs and observed microscopically under the light microscope to identify directly them up to species level. The colony forming units (CFUs) that could not be identified directly from plates were sub cultured in PDA media again and identified later on. Standard staining procedures were used to identify the culture. Cultured fungi on agar plates of different market sites and the identified fungal taxa up to their generic level are given in tables. Percentage occurrence of individual fungus was determined and plotted in the form of tables and graphs.

Calculation of Percentage contribution of an individual fungus:

$$\text{Percentage occurrence of the fungus} = \frac{\text{Total CFUs recorded by the individual fungus}}{\text{Total CFUs recorded by total number of fungi}} \times 100$$

Percentage representation of Fungal spore colonies recorded on Petri plates over vegetable fruit market at Beed during study period.

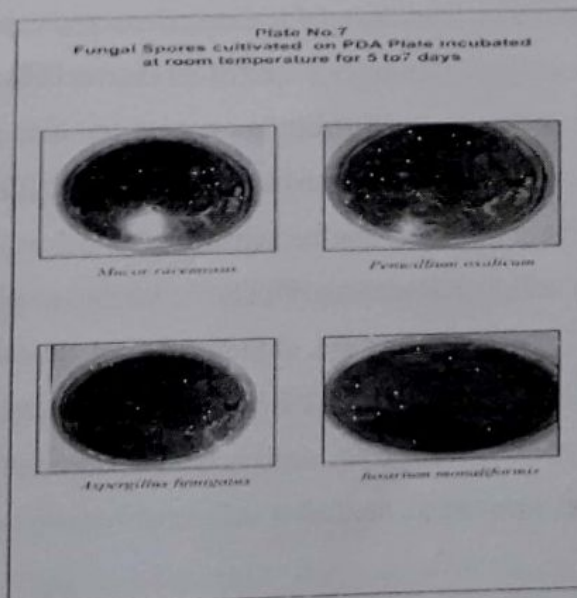
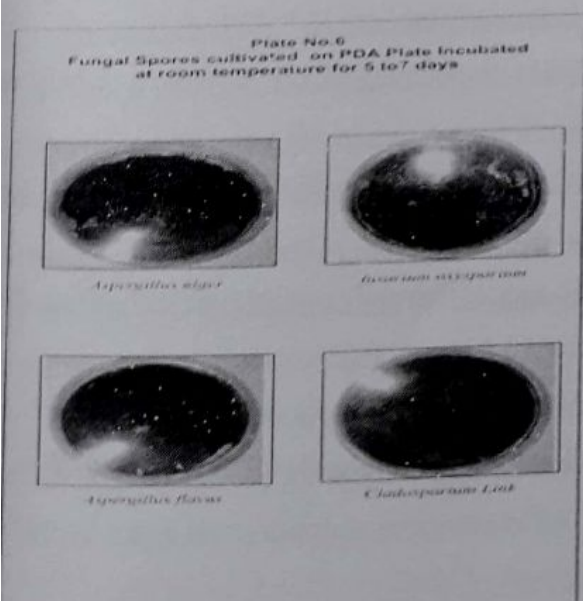
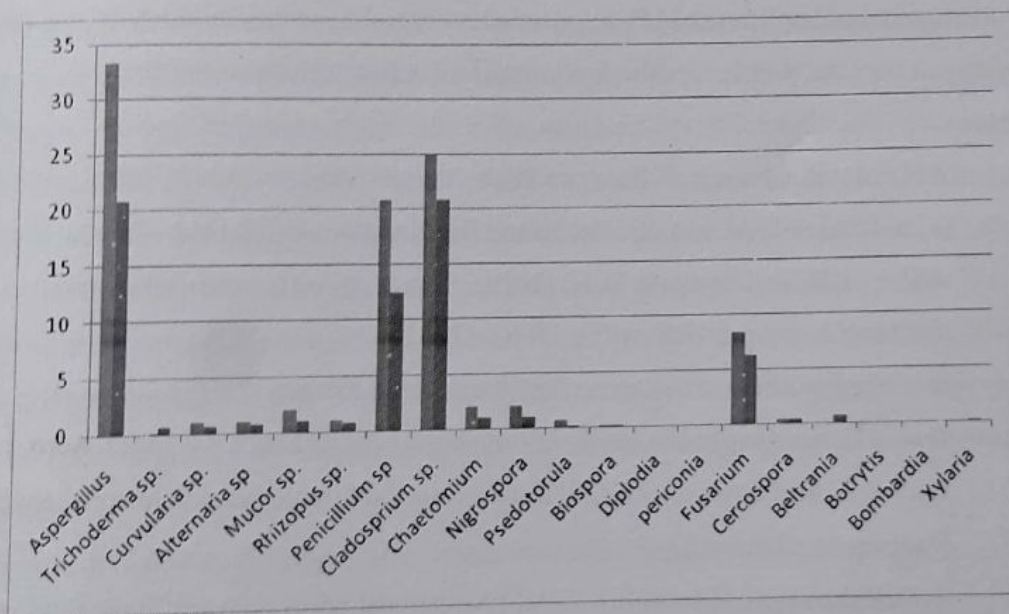
Sr.No.	Name of the fungal spores	In first year	In second year
1	Aspergillus	33.33	20.83
2	Trichoderma sp.	0.20	0.62
3	Curvularia sp.	1.04	0.62
4	Altemariasp	1.04	0.83
5	Mucor sp.	2.08	1.04
6	Rhizopus sp.	1.04	0.83
7	Penicilliumsp	20.83	12.50
8	Cladosprium sp.	25.00	20.83
9	Chaetomium	2.08	1.04
10	Nigrospora	2.085	1.04
11	Pseudotorula	0.62	0.20
12	Biospora	0.20	0.20
13	Diplodia	0.04	0.04
14	periconia	0.04	0.08
15	Fusarium	8.33	6.25
16	Cercospora	0.41	0.41
17	Beltrania	0.08	0.62
18	Botrytis	0.08	0.04
19	Bombardia	0.08	0.04
20	Xylaria	0.08	0.16

Results and Discussion

A total 20 genera of fungal colonies were recorded from different sites of market as shown in the table. Aspergillus, Cladosporium, Fusarium and Penicillium were more dominant in all the seasons. Majority of

fungi are of Deuteromycotina groups. The seasonal variations in the Aeromycoflora were observed. In the month of April and October the percentage of fungal spores was to much more while in the month of January and June the Percentage contribution of the fungi was low as compared to the other months .In the winter seasons all the spores type were recorded while in the summer seasons Aspergillus ,Cladosporium and Penicillium were maximum while in rainy season the maximum percentage was of Aspergillus,Rhizopus and Mucor. In the present study Aspergillus was observed as most dominant and frequent species similar result were found by earlier workers Sharma 2001 ,Verma 1992 , Aghashe 1997, Mahajan 2007 ,Pund 2007 Saroja 2007 and Giri 2010 , A Nanda; B K Nayak; N Behera 2014 .

Graphical representation of Percentage of Fungal spore colonies recorded during study period



Conclusion

From this study it was revealed that a large number of pathogenic microorganisms are always present in the market atmosphere that cause serious health hazards to humans, vegetable and fruit deterioration and air pollution so it is important that the market ambient air should be continuously monitored for air-borne pathogens. Periodic cleaning operations and maintenance activities of different market environment should be taken as a preventive measure, though isolated fungi are tentatively identified by morphological and physiological it needs further identification through 16S and 18S rRNA sequencing for bacteria and fungi respectively. Because it was observed that most of shopkeepers, visitors in the market are affected with toxic Aeromycoflora and showing the symptoms of some allergic diseases, vegetable and fruit deterioration and air pollution. So it is necessary to keep the market clean daily cleaning is necessary and periodically monitoring of Aeromycoflora is also necessary and control measures of the Aeromycoflora is also very much essential.

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