

Environmental Biopollutants inside Gunj Vegetable Market Nizamabad

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Abstract

Original Research Article

Air monitoring over the vegetable market was undertaken by using Burkard air sampler and petriplate exposure method. Preliminary investigation with the help of Burkard air sampler indicates very high concentration of *Aspergillus* (34.10%) in Sept. 2019 and (42.80%) in Oct. 2019. Petriplate exposure method also indicates similar type of observation in addition to *Aspergillus* type. Several other types were also encountered which have been identified. The relevance of the concentration of spore types and meteorological parameters has been brought out. The influence on the visitors due to the release of pathogenic forms of the vegetable market is also in consideration and detailed results will be presented in due course.

Keywords: Biopollutants Gunj Vegetable Market Air monitoring Petriplate *Aspergillus*.

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INTRODUCTION

Airborne models have been found to be responsible for biodegradation of vegetables and fruits in market area. Many of the microbial forms of the aeromicrobiota are hazardous to plants animals and human beings. The influence of meteorological parameters like temperature, humidity rainfall and wind velocity also play important role. The fungi growing on vegetables /fruits in the market form the sources of spores where they grow as saprophytes or parasites. There is a direct relationship between the occurrence of market diseases of vegetables and aeromicroflora of the particular market.

Sullia and Khan [1], and Singh and Misra [2] have studied aeromicroflora of the different vegetable market atmospheres and stated that a relationship exists between the occurrence of market diseases of vegetables/fruits and aeromicroflora of the particular market. There is also possibility of release of spores in the market environment during storage and transit. The aerospora of market may also have some implications on the health of the people working in the market and the visitors.

MATERIAL AND METHODS

Aerobiological survey was carried out inside Gunj Vegetable Market, Nizamabad, and Telangana from Sept 2019-Nov 2019. Fungal spores were sampled fortnightly by Andersen sampler i.e. exposure of

petridishes containing agar media in the open air for 5 and 10 minutes and by operating Burkard air sampler for ten minutes. Slides were prepared and scanned and number of spores/m³ of air was calculated. During the sampling, sampler was kept at a constant height to 3feet.

RESULTS AND DISCUSSION

Both Burkard air sampler and Andersen sampler were used simultaneously. The samplers provide both qualitative and quantitative data of aeromicrobiota, large numbers of spore counts were recorded during the study period. The results of scanning shows a total 40 identified fungal spore types. The relative contribution of the fungal group of the total airspora shows 2 Phycmycotina, 7 type of Ascomycotina, 3 types of Basidiomycotina and the remaining of Deuteromycotina. The other type includes unidentified spores, insect scales, protozoan cysts, algal filaments, etc. The class Deuteromycotina contributes 86.6% to the total airspora, *Aspergillus* was the dominant spora type throughout the period of investigation. The *Aspergilli* contributed (36.2%) to the total airspora.

The second dominant type was *Cladosporium* (23.19%) followed by *Alternaria curvularia* (*.61%). *Helminthosporium* (5.09%). *Nigrospora* (2.10%), *Smuts* (1.32%) and *Dreschhlara* (1.59%). The results of petriplate exposure shows the dominance of *Aspergillus niger* (10.02%) and *Aspergillus flavus* (8.10%) followed by *Aspergillus fumigates* (4.58%). *Aspergillus candidus*

(2.20%) *Aspergillus nidulans* (1.74%) and *Aspergillus sydowii* (1.22%)

The highest concentration of *Aspergillus* sps. was observed in the month of Oct. (42.8%). The favourable meteorological factors such as mean humidity, (80.3%) mean rainfall (4.19%) mean temperature (19.7%) plays an important role in the growth of fungal spores.

Conclusively, the working environment like market place with microbial contamination or

biopollutants may be a major health problem. Biodegradation of stored products and other organic materials have been subjected to large number of airborne spores when they are transported.

It has been known that inhalation of mild spores can produces allergic respiratory symptoms [3, 4]. It is believed that a relationship exists between the occurrence of market diseases and the airspora of particular market [1]. The adverse effects of inhaled fungal spores causes disorders like rhinitis, asthma and bronchial disorders.

Table-1: Monthly variation in percentage contribution of various groups in Gunj Vegetable Market Environment

Groups	September	October	November
Phycomycotina	13.47	7.78	5.19
Ascomycotina	1.6	1.51	1.48
Deuteromycotina	83.33	88.55	9.12
Other types	1.60	2.16	3.21

Table-2: Percentage contribution of major fungal types trapped by Burkard Sampler from the Air of Gunj vegetable Market

Spore type	September	October	November
Smuts	1.02	1.27	1.62
Alternaria	1.2	14.00	9.78
Aspergilli	34.80	42.80	31.02
Cercospora	0.82	1.20	0.38
Cladosporium	20.08	26.90	22.60
Curvularia	5.02	12.87	7.96
Drechslera	1.82	1.99	0.98
Fusarium	2.00	3.02	1.28
Helminthosporium	6.02	4.80	4.45
Nigrospora	2.10	1.78	2.43
Hyphal Fragm	2.21	1.82	0.98
Other types	6.81	6.30	4.92

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