RESEARCH ARTICLE

AEROMYCOLOGICAL STUDY OF APMC FRUIT MARKET OF VASHI

Baviskar RN[1] and Suryawanshi NS [2]

[1]Department of Botany, ICLES' M. J. College, Vashi, Navi Mumbai.

[2]Research Laboratory, Department of Botany, K. V. Pendharkar College, Dombivli (E)-421203 (MS) India.

ABSTRACT

A present survey of aeromycoflora of APMC fruit market of Vashi, Navi Mumbai was conducted during two successive seasons from August to October, 2011 and August to October, 2012. During this period Apple (*Pyrusmalus* L.) are abundant in the market of Vashi. The aeromycological study was carried out by using gravity slide as well as petriplate exposure method with a view to correlating the decay of Apples in the market. Twenty five microfungi were trapped from the air over the fruit market and the *Penicillium expansum* and *Aspergillus sp.* were found to be dominant.

Keywords : Apple, APMC fruit market, aeromycoflora.

INTRODUCTION

Present investigation deals with the study of aeromycoflora of APMC fruit Market, Vashi. Keeping in this view attempt was made to investigate the aeromycoflora on apple in Vashi fruit market and observed twenty five fungi viz. *Sphaeropsis pyriputrescens, Venturiainaequalis, Botrytis cinerea, Alternaria alternata, Mucor piriformis, Aspergillus fumigatus, A. flavus, A. tenuis, A. niger, Phytophthora cactorum, Phytophthora parasitica, Sclerotina fructigena, Rhizopus nigricans, Rhizopus stolonifer, Rhizopu sarrhizus, Penicillium chrysogenum, Penicillium citrinum, Penicillium digitatum, Penicillium funiculosum, Penicillium italicum, Penicillium solitum, Penicillium commune, Penicillium regulosum*, *Penicillium expansum* and *Curvularia lunata*. Above twenty five fungi were pathogenic as well as non-pathogenic. The pathogenic fungi viz. *Penicillium expansum* and *Aspergillus niger* were dominant and serious on apple fruits. It is very severed and causing blue mold and *Aspergillus* rot respectively.

***Corresponding Author**

Email: baviskar_ramesh@yahoo.co.in

The wide variety of biological particles present in the atmosphere, there is a very significant number of fungal spores. The biopollutants of the atmosphere are causing serious diseases of crops in the vegetable and fruit markets. These agricultural commodities are being attacked in their post harvest conditions viz. in packaging, transit, trans-shipment and storage. Many workers investigated the occurrence of aeromycoflora in the different crop field and their correlation with the different diseases of fruits viz (Papaya, banana, citrus and pineapple), cereals (rice, jawar, wheat and bajara), sugarcane etc. (Tilak and Kulkarni, 1980; Sharma and Bhattacharjee, 2001; Medhi and Sharma, 2010) studied the aeromycoflora in the fruit markets. Apples in the markets of Vashi were reported to be decayed due to the invasion of certain microbes. In view of the above reports major vegetable and fruit markets of Vashi, Navi Mumbai was surveyed from aeromycological point of view. Chenulu and Thakur (1968) reported that *Aspergillus niger* and *Rhizopus oryzae* were considered to be responsible to cause major diseases in various fruits in Delhi market. Aeromycoflora were largely determined by topography, meteorological parameters, vegetation and biotic factors including human activities. The study of fungal aerospora of market may have some implications on the health of people working in the

market, customers, sellers, etc. Keeping in view of the above, an attempt was made to investigate the occurrence of aeromycoflora and the incidence of diseases of these useful fruit. Among the various pathogens *Aspergillus niger* and *Penicillium expansum* is an important post harvest disease of apple and it's responsible for most losses that occur in most commercial store rooms (Spotts*et al.* 1999) found to be dominant in the store houses of local and central fruit markets of various places of Maharashtra, particularly in Mumbai and Navi Mumbai (APMC Market, Vashi) in packing boxes noted different damages of apple.

MATERIAL AND METHODS

The consecutive survey was carried out from August to October, 2011 and August to October, 2012. In the APMC fruit Market of Vashi. Air samplings in the fruit market of apple at two weeks intervals using Gravity slide and Petriplate exposure methods using Czapek'sDox Agar Medium. Petriplate were exposed to the air in fruit market at different time intervals such as 0, 5, 10 and 15 minutes and at different heights i.e. 0 levels (ground level), 500cm, 1000cm and 2000cm above ground level for trapping aeromycoflora. These agar plates were incubated at (28 ±1) ºC for 7 days.After seven days colony character, culture pattern were studied and identified different aeromycoflora using literatures. Total twenty five fungi were found in APMC fruit market Vashi at different height and time interval were considering the study of aeromycoflora. (Sreeramulu, 1959; Asan*et al*., 2002; Uddin, 2004).

RESULTS & DISCUSSION:

A total of twenty five mycoflora were trapped and observed from the air of APMC fruit market Vashi. There are twenty five fungi were noted viz. *Sphaeropsispyriputrescens, Venturiainaequalis, Botrytis cinerea, Alternaria alternata, Mucor piriformis, Aspergillus fumigatus, A. flavus, A. tenuis, A. niger, Phytophthora cactorum, Phytophthora parasitica, Sclerotina fructigena, Rhizopus nigricans, Rhizopus stolonifer, Rhizopus arrhizus, Penicillium chrysogenum, Penicillium citrinum, Penicillium digitatum, Penicillium funiculosum, Penicillium italicum, Penicillium solitum, Penicillium commune, Penicillium regulosum*, *Penicillium expansum* and *Curvulari alunata* using gravity slide and agar plate exposing method. Agar plates were exposed at 0, 5, 10, 15 minutes at different levels and accordingly the mycoflora were trapped.

Table 1: Frequency of occurrence of mycoflora at different height (cm) in the market of apple.

Fungi	Height (cm)			
	Ground level(0)	500	1000	2000
Sphaeropsispyriputrescens	+++	++	+	-
Venturiainaequalis	+++	++	+	+
Botrytis cinerea	+++	++	+	-
Alternaria alternate	**++++**	**+++**	**++**	**+**
Mucorpiriformis	+++	++	+	-
Aspergillusfumigates	**++++**	**+++**	**++**	**+**
Aspergillus flavus	**++++**	**+++**	**++**	**+**
Aspergillustenuis	++++	++	++	+
Aspergillus niger	**++++**	**+++**	**++**	**+**
Phytophthoracactorum	+++	++	++	+
Phytophthoraparasitica	+++	++	++	+
Sclerotinafructigena	+++	++	++	+
Rhizopusnigricans	+++	++	+	-
Rhizopus. Stolonifer	**++++**	**+++**	**++**	**-**
Rhizopusarrhizus	+++	++	+	-
Penicilliumchrysogenum	+++	++	++	+
Penicilliumcitrinum	+++	++	++	+
Penicillium digitatum	**++++**	**+++**	**++**	**+**
Penicilliumfuniculosum	**++++**	**+++**	**++**	**+**
Penicillium italicum	+++	++	++	+
Penicilliumexpansum	**++++**	**+++**	**++**	**+**
Penicilliumsolitum	+++	+++	++	+
Penicillium commune	+++	++	++	+
Penicilliumregulosum	+++	++	+	+
Curvularia lunata	++++	+++	+	+

N.B. = +: 25 per cent frequency of occurrence of fungal species; ++ : 50 per cent frequency of occurrence of fungal species; +++ : 75 per cent frequency of occurrence of fungal species; ++++ : 100 per cent frequency of occurrence of fungal species.

The fungal spores settled down on agar plate at different level and at different time intervals shown in Table 1 and Table 2. *Sphaeropsis pyriputrescens, Botrytis cinerea, Rhizopus nigricans, R. stolonifer, Rhizopus arrhizus, Mucor piriformis,* were not found at the height of 2000cm.

Table 2: Frequency of occurrence of mycoflora at different periods of exposure in the fruit marketof apple

Fungi	Different Period of exposure (in minutes)			
	0	5	10	15
Sphaeropsispyriputrescens	-	+	++	+++
Venturiainaequalis	-	+	++	++
Botrytis cinerea	-	+	+++	+++
Alternaria alternate	**-**	**++**	**+++**	**++++**
Mucorpiriformis	-	+	++	++
Aspergillus fumigates	**-**	**++**	**++**	**++++**
Aspergillus flavus	**-**	**++**	**+++**	**++++**
Aspergillustenuis	-	+	+++	+++
Aspergillus niger	**-**	**++**	**+++**	**++++**
Phytophthoracactorum	-	+	++	+++
Phytophthoraparasitica	-	+	++	+++
Sclerotinafructigena	-	+	++	+++
Rhizopusnigricans	-	+	++	+++
Rhizopus. Stolonifer	**-**	**+**	**++**	**++++**
Rhizopusarrhizus	-	+	++	+++
Penicilliumchrysogenum	-	+	++	+++
Penicilliumcitrinum	-	+	++	+++
Penicillium digitatum	**-**	**+**	**+++**	**++++**
Penicilliumfuniculosum	**-**	**+**	**+++**	**++++**
Penicillium italicum	-	+	++	+++
Penicilliumexpansum	**-**	**++**	**+++**	**++++**
Penicilliumsolitum	-	+	++	+++
Penicillium commune	-	+	++	+++
Penicilliumregulosum	-	+	++	+++
Curvularia lunata	-	+	++	+++

N.B. = +: 25 per cent frequency of occurrence of fungal species; ++ : 50 per cent frequency of occurrence of fungal species; +++ : 75 per cent frequency of occurrence of fungal species; ++++ : 100 per cent frequency of occurrence of fungal species.

The most dominant aeromycoflora on agar plate were observed in Vashi fruit market. *Alternaria alternata, Aspergillus fumigatus, Aspergillus flavus, A. niger, P. funiculosum, P. digitatum, Rhizopusstolonifer* and *Penicillium expansum*. *Aspergillusniger* and *Penicillium expansum* were found serious on apple and were recorded at different height. Most of aeromycoflora *Sphaeropsis pyriputrescens, Venturia inaequalis, Botrytis cinerea, Alternaria alternate, Muco rpiriformis, Aspergillus fumigatus, A. flavus, A. tenuis, A. niger, Phytophthora cactorum, Phytophthora parasitica, Sclerotina fructigena, Rhizopus nigricans, Rhizopus stolonifer, Rhizopusarrhizus, Penicillium chrysogenum, Penicillium citrinum, Penicillium digitatum, Penicillium funiculosum, Penicillium italicum, Penicillium solitum, Penicillium commune, Penicillium regulosum*, *Penicillium expansum* and *Curvulari alunata* were observed at ground level and followed by 500, 1000 and 2000cm. similarly aeromycoflora occurrence at different time period. The maximum number of fungi were noted at 15 minutes time intervals and followed by 10, 5 and 0. Mycoflora were not settled on agar plate as compared to 15 minutes. Similar reports were illustrated by Lim *et al*. (1980) and Padmanavan*et al*. (1953).

REFERENCES:

Asan A, Sav B and Sarica S (2002) Airborne fungi in urban air of Edime city (Turkey). *Biologia*. 57: 59-68.

Chenulu VV and Thakur DP (1968) *Aspergillus niger* and *Rhizopus oryzae* were considered to be responsible to cause major diseases in various fruits. *Indian Phytopath*. 4: 65-70.

Lim Tong-Kwee and Rohrback KG (1980) Role of *Penicilliumfuniculosum*srains in development of pineapple fruit diseases. (Ecology and Epidemology). *Phytopathol.*, 70(7): 663-665.

Medhi S and Sharma TC (2010) Study of onion and Ginger Store houses of Guwahati, Assam. *J. Life Sci.,* 28:548-552.

Padmanabhan SY, Ganguli D and Balkrishnan MS (1953) Helminthosporium disease of Rice II. Source and development of seedling infection. *Indian Phytopathology*, 5: 96-105.

Sharma TC and Bhattacharjee RN (2001) Occurrence of Aeromycoflora of Banana fruit market. *J. Adv. Pl. Sci.,* 42:177-184.

Spotts RA, Cervantes LA and Mielke EA (1999) Variability in post harvest decay among apple cultivars. *Plant Dis.* 83: 1051-1054.

Sreeramulu T (1959) The diurnal and seasonal periodicity of certain plant pathogen in the air. *Trans. Br. Mycol. Soc.*, 42: 172-184.

Tilak ST and Kulkarni RL (1980) Some additions to the fungal flora of the air. Ind. *Phytopath*.34: 69-71.

Uddin N (2004) Air spore studies over a rice (high yielding variety) field in rabi season in the state of West Bengal, India. *Aerobiologia*. 20: 127-134.

Cite this article as: Baviskar RN and Suryawanshi NS (2013) Aeromycological study of APMC fruit market of Vashi, *Int. J. of Life Sciences,* Special Issue A (1):52- 54.