



Survey of Aeromycoflora Present in APMC Fruit Market Vashi Navi Mumbai

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ABSTRACT

The present study was aimed to investigate aeromycoflora of APMC fruit market of Vashi, Navi Mumbai was conducted during two consecutive seasons from August to October, 2019 and August to October, 2020. During this period Pear (*Pyrus communis* L.) are abundant in the fruit 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 pear fruits in the market. Twenty five aeromycoflora were trapped from the air over the fruit market and the *Penicillium expansum*, *Botrytis cinerea*, and *Mucor piriformis* are the three most common causative factors of pear rot and loss.

Keywords: Pear, APMC fruit market, aeromycoflor.

INTRODUCTION

The growth of filamentous fungi in highly perishable fruits including pears is an important quality problem that may lead to significant economic losses. 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 pear in Vashi fruit market and observed twenty five fungi viz. *Sphaeropsis pyriputrescens*, *Venturia inaequalis*, *Botrytis cinerea*, *Alternaria alternata*, *Mucor piriformis*, *Aspergillus fumigatus*, *A. flavus*, *A. tenuis*, *A. niger*, *Phytophthora cactorum*, *Phytophthora parasitica*, *Sclerotinia 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 *Curvularia lunata*. Above twenty five fungi were pathogenic as well as non-pathogenic. The pathogenic fungi viz. *Penicillium expansum*, *Botrytis cinerea* and *Mucor piriformis* were dominant and serious on pear fruits. It is much severed and causing blue mold, gray mold and *Mucor* rot respectively. 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. Pears 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 *Penicillium expansum*, *Botrytis cinerea* and *Mucor piriformis* is an important post harvest disease of pear 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 pear.

MATERIAL AND METHODS

The consecutive survey was carried out from August to October, 2019 and August to October, 2020. In the APMC fruit Market of Vashi. Air samplings in the fruit market of pears at two weeks intervals using Gravity slide and Petriplate exposure methods using Czapek's Dox 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 ± 2) °C for 7 days. After seven days colony character, culture pattern was 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

Total twenty five mycoflora were trapped and observed from the air of APMC fruit market Vashi viz. *Sphaeropsis pyriputrescens*, *Venturia inaequalis*, *Botrytis cinerea*, *Alternaria alternata*, *Mucor piriformis*, *Aspergillus fumigatus*, *A. flavus*, *A. tenuis*, *A. niger*, *Phytophthora cactorum*, *Phytophthora parasitica*, *Sclerotinia 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 *Curvularia lunata* using gravity slide and agar plate exposing method. Agar plates were exposed at 0, 5, 10 and 15 minutes at different levels and accordingly the mycoflora were trapped. 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*, *Rhizopus nigricans*, *Rhizopus stolonifer*, *Rhizopus arrhizus* were not found at the height of 2000cm. The most dominant aeromycoflora on agar plate were observed in Vashi fruit market. *Alternaria alternata*, *Aspergillus fumigatus*, *Aspergillus flavus*, *Aspergillus niger*, *Botrytis cinerea* *Penicillium funiculosum*, *Penicillium digitatum*, *Rhizopus stolonifer*, *Mucor piriformis* and *Penicillium expansum*. *Penicillium expansum*, *Botrytis cinerea* and *Mucor piriformis* were found serious on pear and were recorded at different height. Most of aeromycoflora *Sphaeropsis pyriputrescens*, *Venturia inaequalis*, *Botrytis cinerea*, *Alternaria alternate*, *Mucor piriformis*, *Aspergillus fumigatus*, *A. flavus*, *A. tenuis*, *A. niger*, *Phytophthora cactorum*, *Phytophthora parasitica*, *Sclerotinia fructigena*, *Rhizopus nigricans*, *Rhizopus stolonifer*, *Rhizopus arrhizus*, *Penicillium chrysogenum*, *Penicillium citrinum*, *Penicillium digitatum*, *Penicillium funiculosum*, *Penicillium italicum*, *Penicillium solitum*,

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

Fungi	Height (cm)			
	Ground level (0)	500	1000	2000
<i>Sphaeropsis pyriputrescens</i>	+++	++	+	-
<i>Venturia inaequalis</i>	+++	++	+	+
<i>Botrytis cinerea</i>	++++	+++	++	++
<i>Alternaria alternate</i>	+++	++	++	+
<i>Mucor piriformis</i>	++++	+++	++	++
<i>Aspergillus fumigatus</i>	++++	+++	++	+
<i>Aspergillus flavus</i>	++++	+++	++	+
<i>Aspergillus tenuis</i>	++++	++	++	+
<i>Aspergillus niger</i>	++++	+++	++	+
<i>Phytophthora cactorum</i>	+++	++	++	+
<i>Phytophthora parasitica</i>	+++	++	++	+
<i>Sclerotinia fructigena</i>	+++	++	++	+
<i>Rhizopus nigricans</i>	+++	++	+	-
<i>Rhizopus. Stolonifer</i>	++++	+++	++	-
<i>Rhizopus arrhizus</i>	+++	++	+	-
<i>Penicillium chrysogenum</i>	+++	++	++	+
<i>Penicillium citrinum</i>	+++	++	++	+
<i>Penicillium digitatum</i>	++++	+++	++	+
<i>Penicillium funiculosum</i>	++++	+++	++	+
<i>Penicillium italicum</i>	+++	++	++	+
<i>Penicillium expansum</i>	++++	+++	++	++
<i>Penicillium solitum</i>	+++	+++	++	+
<i>Penicillium commune</i>	+++	++	++	+
<i>Penicillium regulosum</i>	+++	++	+	+
<i>Curvularia lunata</i>	++++	+++	+	+

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.

Table 2: Frequency of occurrence of mycoflora at different periods of exposure in the fruit market of pear.

Fungi	Different Period of exposure			
	0 minutes	5 minutes	10 minutes	15 minutes
<i>Sphaeropsis pyriputrescens</i>	-	+	++	+++
<i>Venturia inaequalis</i>	-	+	++	++
<i>Botrytis cinerea</i>	-	++	+++	++++
<i>Alternaria alternata</i>	-	++	++	+++
<i>Mucor piriformis</i>	-	++	+++	++++
<i>Aspergillus fumigatus</i>	-	++	++	++++
<i>Aspergillus flavus</i>	-	+	+++	+++
<i>Aspergillus tenuis</i>	-	+	+++	+++
<i>Aspergillus niger</i>	-	++	+++	+++
<i>Phytophthora cactorum</i>	-	+	++	+++
<i>Phytophthora parasitica</i>	-	+	++	+++
<i>Sclerotinia fructigena</i>	-	+	++	+++
<i>Rhizopus nigricans</i>	-	+	++	+++
<i>Rhizopus. Stolonifer</i>	-	+	++	+++
<i>Rhizopus arrhizus</i>	-	+	++	+++
<i>Penicillium chrysogenum</i>	-	+	++	+++
<i>Penicillium citrinum</i>	-	+	++	+++
<i>Penicillium digitatum</i>	-	+	+++	++++
<i>Penicillium funiculosum</i>	-	+	+++	++++
<i>Penicillium italicum</i>	-	+	++	+++
<i>Penicillium expansum</i>	-	++	+++	++++
<i>Penicillium solitum</i>	-	+	++	+++
<i>Penicillium commune</i>	-	+	++	+++
<i>Penicillium regulosum</i>	-	+	++	+++
<i>Curvularia lunata</i>	-	+	++	+++

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.

Penicillium commune, *Penicillium regulosum*, *Penicillium expansum* and *Curvularia lunata* 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 and Rohrback, 1980 and Padmanabhan *et al.*, 1953).

Conflicts of Interest: The authors declare no conflict of interest.

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