

Intensity And Screening of Fungi Causing Market Diseases of Banana (*Musa paradiscica*)

Baig Mumtaz

Dr. Rafiq Zakaria College for Women,
Aurangabad- 431001, (M.S.)

Abstract: Post-harvest diseases caused by fungi develops on fruits and other plant products between harvesting and consumption. The threat of post-harvest disease influences the way most horticultural crops are handled. Therefore the accurate identification of the causal pathogen is essential before appropriate treatment can be made to control the pathogens. In the present study a number of fungi viz., *Alternaria alternata*, *A. citri*, *Aspergillus niger*, *A. flavus*, sp., *Cladosporium cladosporioides*, *Gleosporium musarum Drechslera australeinsis*, *Fusarium solani*, *Fusarium* sp., *Penicillium* spp., *Phytophthora capsici* and *Rhizopus stolonifer* responsible for post-harvest deterioration of fresh fruits and vegetables were isolated and identified.

Keywords: Post-harvest, pathogen, *Alternaria alternata*, *Phytophthora capsici*, Deterioration.

Introduction:

The banana (*Musa paradiscica*) fruits are the best sources of many vitamins, minerals, carbohydrates, antioxidants like vit-C, vit-E, vit-A & zinc, selenium, lycopene etc. and dietary fibers. Fruits improve overall health of human beings. Strong immune system increases resistance power towards different types of diseases. Fruits provide all types of minerals that are required to our body. The nutritionists placed fruits and green vegetables on the top because; fruits contain all types of essential ingredients which are required for healthy living being. Fruits contain 50-90% moisture. There are reports from different parts of world that antioxidants play important role in anti-ageing process. Human body requires different types of essential amino acids all such amino acid are present in fruits.

The loss of fruits after harvest is a major problem of fruit growing countries of the world. In order to make plan for the disease control, it is very essential to have knowledge of pathogenic organism associated with fruits during storage periods. The associated mycoflora responsible for fruit losses. The aim of study of fruit diseases of market is to develop perfect disease management strategies that are economically significant. The diseases causes change in color, shape and biochemical alteration of the fruit due to interaction of the pathogen and the fruit becomes unfit for consumption. The Amino acids prevent infections of pathogens. The fruits are highly sensitive to the exogenous agencies such as fungi, bacteria etc. that affects the quality of fruit and causes loss of fruit. The diseases of fruits which occur after harvest during packing, transportation and storage periods due to fungal or bacterial pathogen are called as post-harvest diseases, Gupta, (1989).

There are different types of fungi associated with market diseases of banana. for Pankaj Sharma and Verma, (2013) studied *Rhizopus* sp. from post-harvest rot of guava caused due to *Rhizopus* sp. from Sumia, et. al, (2006) reported white rot of papaya by caused by *Sclerotium rolfsii*. Pankaj Sharma and Verma, (2013.) studied post harvest rot of apple disease during storage which was due to infection of *Phytophthora colocaceae*. Fusarium rot of Peach (Choudhury, (1950).); *Alternaria* and *Cladosporium* rot of grapes fruits (Ali, 2010). *Rhizopus* on grapes (Oyeleke and Manga, 2008).

In Marathwada region fruit storage system is not well developed. There are no any facility for storage of fruits after harvest from government. The roads are not well. Hence during transportation many of the fruits get injured. The injured fruits immediately get attacked by saprophytic fungi which causes rot diseases during transportation or storage period. Because of such problems about 20-55 percent fruits get deteriorated due to mycoflora. Some of the pathogenic fungi attack fruits at immature stage and some others infect to overripe fruits. Major loss of harvested fruits is caused due to fungi. The diseases caused before harvest of fruits also responsible for degradation of quality and cost of banana in market.

Material and Method: For the study the banana fruits were collected from godowns different fruit store houses of Aurangabad. From the same lot 10 immature healthy fruits were collected in a sterile polyethylene bag A separate polyethylene bag was used for each fruit. One infected fruit in one bag (Linskens and Jackson, 1995). A separate bag was used even for healthy immature fruits (Bagwan, 2010). The mycoflora responsible for storage rot disease of banana fruit was isolated on PDA (Potato Dextrose Agar) medium by food poisoning technique method. Before inoculation the infected fruit was surface sterilized with the help of 0.1% HgCl₂ solution and then rinsed with the solution of sterile distilled water for 3-5 times to remove traces of HgCl₂ solution. Then a small piece of infected region of fruit was removed with the help of sterile r needle and the infected portion was inoculated on PDA (Potato Dextrose Agar) medium amended petriplate in sterile condition. The inoculated petriplate were incubated at room temperature 24±0°C. The fungus growing from the inoculated infected piece was inoculated on PDA medium. The pathogenicity was confirmed by following Koch's postulates. The fungi were identified on the basis of morphological features, type of colony growth, colour of colony, size and shape of spores and pigmentation.

Table : Isolation of fungus and their Intensity

Sr. no.	Type of fungus	Intensity
1.	<i>Rhizopus oryzae</i>	++++++
2.	<i>Macrophomina phaseolina</i>	++++++
3.	<i>Colletotrichum musae</i>	++++++
4.	<i>Chetothyria musarum</i>	++++
5.	<i>Phoma jolyana;</i>	++++
6.	<i>Fusarium roseum;</i>	++++++
7.	<i>Alternaria alternata;</i>	++++
8.	<i>Verticillium albo- atrum;</i>	++++
9.	<i>Ceratocystis paradoxa;</i>	+++
10.	<i>Colletotrichum musae;</i>	++++
11.	<i>Botryodiploidia theobromae;</i>	+++
12.	<i>Trichothecium roseum</i>	+++
13.	<i>Macrophoma musae</i>	++++
14.	<i>Phytophthora nicotianae</i>	+++
15.	<i>Verticillium theobromae</i>	+++
16.	<i>Helminthosporium torulosum</i>	++++
17.	<i>Nigrospora oryzae</i>	++++
18.	<i>Pestalotia leprilegna</i>	++++
19.	<i>Cladosporium</i>	++++
20.	<i>Rhizopus stolonifer;</i>	++++
21.	<i>Gleosporium musarum</i>	+++
22.	<i>Phoma herbarum;</i>	++
23.	<i>Fusarium oxysporum.</i>	++++
24.	<i>Curvularia lunata;</i>	+++++
25.	<i>Phytophthora palmivora</i>	++++

Result: The table shows the list of 25 fungi responsible for market diseases of banana (*Musa paradisiaca* L.). There were about 26 types of fungi isolated from infected fruits of banana. During collection of fruit samples from various parts godowns of Aurangabad. It was observed that there was numerous types of symptoms were observed due to infection and growth of post-harvest fungi. It is noted that some of the fungal genera showing a broad spectrum of host range. The forms of mycoflora like *Aspergillus*, *Alternaria*, *Curvularia*, *Fusarium*, *Mucor*, *Rhizopus*, *Colletotrichum*, *Penicillium*, *Phytophthora* and *Pestalotia* were found on 20 samples of fruits collected from different godowns. Among the fungal isolates the genus *Aspergillus*, *Rhizopus* and *Fusarium* was found more destructive and was associated with all rotted fruits collected from various godowns.

Conclusion:

The post-harvest diseases of fruits were studied by Kader, A. (1982). Isolated six types of fungi from infected banana fruits. By avoiding contact of fruits with field soil during harvest can reduce infection of most of the fungi causing post-harvest diseases of fruits to avoid economic losses. This practice can reduce disease intensity during storage periods. Proper handling of fruits during harvest, careful grading, proper selection of packing material, are very important factors to avoid infection of post-harvest fungi.

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