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Research Article

MARKET STORAGE DISEASES OF SOME IMPORTANT FRUITS OF LATUR DISTRICT (M.S.) INDIA

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ABSTRACT

The present investigation with deals survey of market storage and post harvest fungal diseases of some important fruit in the market of Latur district was undertaken during June 2019. Recurrent sampling from the available market fruits depicted variable intensity of fungal flora. Fungal diseases of 6 selected fruit were studied and in all 6 fungal pathogens were observed. Among these *Verticillium theobromae, Colletotrichum gloeosporioides, Anthracnose Pomegranate, Botrytis cinerea* and *Aspergillus niger, Colletotrichum gloeosporioides* spp., were found to be major disease causing organisms. Several fungal floras were observed in fruit *Musa paradisiaca, Mangifera indica, Punica granatum, Malus domestica, Cocos nucifera* and *Carica papaya.* The present investigation revealed that fungal infection is mainly due to injury during storage and handling. Heavy loss of harvested fruits caused due to fungal, bacterial and physiological aspects.

INTRODUCTION

Fruits are important part of human diet. They are commercially important and nutritionally indispensable food commodity (Prasanna *et al.,* 2007). Man has kept these commodities in his diet to provide variety, taste, interest, aesthetic appeal and to meet certain nutritional requirements (Wills *et al.,* 1996). Fruits are edible products of the perennial higher plants with high water content, soft texture, sweet, sour and semi astringent flavors. They are rich sources of vitamins (A, B complex and C) and minerals (calcium, iron and phosphorus) in diets to keep human health in goodsted (Tucker, 1993). Fruits are easily digestible and contain ample amounts of different organic acids and digestive enzymes. They are rich sources of roughage value in food, help in bowel movement, prevents constipation, natural fiber and an energy giving materials having high calorific value. Almost all fruits have some medicinal value in one way or the other. Physicians recommend fruits for the treatment of many ailments like scurvy, night blindness, asthma, fever, anemia, ulcers etc. (Peter, 2007). 'An apple a day, keeps the doctor away' is a well known phrase indicating significance of fruits in human diet.

Fungal fruits infection may occur during the growing season, harvesting, handling, transport and post-harvest storage and marketing conditions, or after purchasing by the consumer. One of the limiting factors that influence the fruits economic value is the relatively short shelf-life period caused by pathogens attacked. It is estimated that about 20-25% of the harvested fruits are decayed by pathogens during post-harvest handling (Bhale 2011). Fruits contain high levels of sugars and nutrients element and their low pH values make them particularly desirable to fungal decayed (Singh and Sharma 2007). Present investigation envisages the study of various fungal pathogens responsible for the post harvest, decay & deterioration of economically important fruits from Latur district of Marathwada region of Maharashtra.

MATERIALS AND METHODS

The fruits *Musa paradisiaca, Mangifera indica, Punica granatum, Malus domestica, Cocos nucifera* and *Carica papaya* fruits were collected from different fruits markets of Latur District. A separate polyethylene bag was used for each type of infected fruits in all cases. Nichrome inoculating needles duly sterilized were used to isolate & the pathogens was transferred directly to PDA aseptically. The infected tissue was cut after surface application of alcohol & sterilization with 0.1% $Hgcl_2$ in sterilized distilled water.

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The materials were examined critically with respect to symptomatology and etiology. In some cases the infected tissues were stained by cotton blue and Lactophenol (Mc Lean and Ivimey 1965) and observed under compound microscope. Identification of the pathogens was made with the help of available literature (Biligrami *et al.*1991, Subramanian 1971 and Barnett 1960). Pure cultures of the pathogens were maintained in the laboratory on PDA slants for further study.

The pathogens were isolated, identified and cultures were used to confirm their pathogenicity test in their respective hosts. Fresh disease free samples were brought in to the laboratory and surface sterilized with 0.1% $Hgcl_2$. For inoculations, cork borers of (2mm) diameter were used. They were sterilized by placing in spirit lamp flame, dipping in alcohol & shaking off the excess alcohol by flaming (Granger and Horne 1924). The inoculated samples and their respective controls were kept under sterile humid conditions at room temperature under bell jars. The artificially inoculated samples were examined daily & the extent of damage was recorded.

RESULTS AND DISCUSSION

Market surveys fruits were found to be affected by various fungal infections.

1. ***Musa paradisiaca* L.(*Banana*).** Symptoms of the diseases are clear and spread to blackening irregular and whitish creamy of the fruit skin, shrinkage and folding of the tissues and spot were observed on the fruit and they were very dominant. Pathogens were isolated and identified as a *Verticillium theobromae* causing the pathogen affects even the fruits of Banana.
2. ***Mangifera indica* L. (mango).**Symptoms Produces blight fruit rot. Black prominent spots appear on fruits, the pulp of which become hard, crack and start to decay at ripening. Infected fruits drop. Fungi were isolated *Anthracnose Colletotrichum gloeosporioides.*
3. ***Punica granatum* L. (Pomegranate).** Symptoms of the pericarp and seeds of fruits were infected. Small irregular black spot on fruit which turn later on as dark brown depressed spots infection begins from dorsal surface and spreads towards the seed occupying the rottening of complete fruit. At severity sticky watery fluid developed inside the fruit. Fungi were isolated form *Anthracnose pomegranate.*
4. ***Malus domestica* L. (Apple).** Symptoms of the Infection brings from small lesions on dorsal side and spread fairly towards the centre occupying the complete fruit surface showing is blackish whitish mycelium with blackish patches on the pulp of fruit. It causes "grey mold rots" of fruits Rottening of fruit take place at severity. Fungus was isolated *Botrytis cinerea.*
5. ***Cocos nucifera* (Coconut).** Smooth walled stipes and black or near black coloured conidia formed and white to yellow mycelia surface later bearing black conidia covered. Fungi isolated are *Aspergillus niger.*
6. ***Carica papaya* (Papaya).** The disease is initiated with the development of small light yellowish brown lesions on the skin of the fruit which enlarge and become dark brown in colour. With the development of the disease the spots become well differentiated from the healthy portions of the fruits. The lesions are usually regularly round or elliptical but later on become irregular due to coalescence of two or more spots. In severe cases the disease may cover one-quarter to one-half or even more of the fruit surface. The lesions remain covered with abundant black dots indicating the acervuli of the fungus. The conidia of the fungus are produced in abundance. Fungi isolated are *Anthracnose Colletotrichum gloeosporioides*

The album of post harvest diseases of fruits created to cheat awareness among the researchers regarding morphological features of infected fruits by pathogenic fungi and to promote research regarding management of post harvest diseases of fruits which is responsible for losses of millions of rupees every year. Second purpose of creating album of fruit diseases is that the preserved museum specimen of infected fruits does not show the natural symptoms of the disease. The post harvest diseases of most of the fruits available in market were collected isolated the respective pathogen and confirmed by using key proposed by Kochs postulates. Similar results on post harvest fungi on storage fruits were reported by earlier workers Good handling will ensure that the final consumers are satisfied and so will return again to buy that product (Vander Steen, *et al.* 2001).Survey of market storage diseases of some important fruits of Osmannabad District (M. S.) Bhale (2011) India Post harvest pathogens on some fruits were reported by Basha *et al.* 2009, Rao 1963, Srivastava *et al.* 1964 and Mandal and Dasgupta 1983.Similar finding has been reported by Dange (1998) and Cherian (2005). Ghurde and Pachkhede (2010) was reported the market and storage diseases of fruits from Amravati. Recently, Gadgile *et al.* (2011) was reported post harvest fungi associated with mango fruits.

CONCLUSION

Fruits are the essential requirement of human diet. Among these fruits producing the chief source of vitamin C, minerals and salts. A wide variety of fungal and bacterial pathogens cause postharvest disease in fruits. Some of these infect produce before harvest and then remain quiescent until conditions are more favourable for disease development after harvest. Other pathogens infect produce during and after harvest through surface injuries. In the development of strategies for postharvest disease control, it is imperative to take a step back and consider the production and postharvest handling systems in their entirety. Many preharvest factors directly and indirectly influence the development of postharvest disease, even in the case of infections initiated after harvest. Traditionally fungicides have played a central role in postharvest disease control. However, trends towards reduced chemical usage in horticulture are forcing the development of new strategies. All fruits are storage as the average temperature for the good marketing whereas fruit crops are affected by the many pathogens on postharvest. Thus, proper growth of postharvest technology of fruits is vital for development of India"s economy.

In present investigation, the fungi like *Verticillium theobromae, Anthracnose Colletotrichum gloeosporioides, Anthracnose Pomegranate, Botrytis cinerea Aspergillus niger* spp., and *Anthracnose Colletotrichum gloeosporioides* species were found on edible fruits which may causes allergenic effects on human health. Therefore it needs to undertake the management practices by using botanicals.