

RESEARCH ARTICLE

Post-harvest fungal diseases of fruits and vegetables in Nagpur

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Manuscript details:	ABSTRACT
<p>Date of publication 18.10.2014</p> <p>Available online on http://www.ijlsci.in</p> <p>ISSN: 2320-964X (Online) ISSN: 2320-7817 (Print)</p> <p>Editor: Dr. Arvind Chavhan</p>	<p>The survey of postharvest fungal diseases of some fruits and vegetables in the market of Nagpur was undertaken. Fruits and vegetables suffer every year due to number of pathogenic diseases. Postharvest diseases are caused by bacteria, yeast and fungi develops on fruits and vegetables between harvesting and consumption. Fungal diseases of 17 selectable fruits and vegetables were studied and their fungal pathogen were observed. Amongst these are <i>Aspergillus</i>, <i>Alternaria</i> sp., <i>Fusarium</i> sp., <i>Mucor</i> sp., <i>Penicillium</i> sp. and <i>Rhizopus</i> sp found to be major disease causing organism. The present investigation revealed that fungal infection is mainly due to injury during storage and handling.</p> <p>Key words: Postharvest diseases, fungus, injury</p>
<p>Cite this article as: Rinkey Pallavi, Thakur Uma, Dongarwar Nitin (2014) Post-harvest fungal diseases of fruits and vegetables in Nagpur, <i>Int. J. of Life Sciences</i>, Special Issue A2: 56-58.</p> <p>Acknowledgements: Authors are thankful to the Head, Department of Botany, RTM Nagpur University for providing necessary facility.</p> <p>Copyright: © Author(s), This is an open access article under the terms of the Creative Commons Attribution-Non-Commercial - No Derives License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.</p>	<p>INTRODUCTION</p> <p>Food scarcity is one of the important major problems faced by several countries. It is reported that nearly 1 billion people are challenged by severe hunger in these nations of which 10% actually die from hunger-related complications. A substantial part of this hunger problem stems from inadequate agricultural storage and produce preservation from microbes-induced spoilages (Salami and Popoola, 2007; Kana <i>et al.</i>, 2012). The most important losses in agricultural productions which involve the greatest costs on the farm economy occur by post harvest diseases. It is estimated that 10 to 40% losses nation of agricultural produce occur due to post harvest diseases worldwide. Losses are more severe in developing than developed nations of the world (Enyiukwu1, 2014).</p> <p>Post harvest activities include harvesting, handling, storage, processing, packaging, transportation and marketing (Mrema and Rolle ,2002). These post harvest losses are caused by the disease which occurs on fruits and vegetables. Post-harvest diseases destroy 10-30 % of the total yield of crops and in some perishable crops especially in developing countries; they destroy more than 30% of the crop yield (Kader, 2002; Agrios, 2005).</p> <p>MATERIALS AND METHODS</p> <p>Samples were collected in the months of January –March from different vegetable and fruit markets of Nagpur City. The temperature during these</p>

months ranges from 22-24 \pm 2°C. The sampling was done during morning (07 a.m. to 10 a.m.). Samples of fresh as well as previously infected or rotten fruits and vegetables were collected in pre-sterilized polythene bags from the market to examine post harvest fungi. They were kept in isolated conditions for the proper growth of the fungal hyphae. Conditions were maintained in moist chamber at room temperature for 7-10 days. Vegetable and fruit samples were taken to the laboratory and the causal organisms infecting the samples were identified from standard literature. Fungi from these samples were observed directly by preparing lacto-phenol cotton blue mounts. Fungal identification is based largely on the morphological characters of spores and spores bearing structure by

using direct microscopy. Identification of fungi was also based on the color of mycelia and microscopic examinations of vegetative and reproductive structures. Different types of fungal pathogens were isolated from the collected vegetables and fruits.

RESULTS AND DISCUSSION

Fungal diseases of fruits and vegetables were studied and in all 19 fungal pathogens were observed. Among these *Alternaria solani*, *Aspergillus niger*, *Aspergillus fumigatus*, *Fusarium* sp., *Mucor* sp., *Penicillium* sp. and *Rhizopus* sp., were found to be major disease causing organisms.

Table 1 : Infected Vegetables and Fruits with Their Collection Sites

Sr. No.	Name of Vegetables and Fruits	Common Name	Pathogen	Sample Collection Site
1.	<i>Alium cepa</i>	Onion	<i>Aspergillus niger</i>	Cotton Market, Kalamana, Sakkardara, Itwari, Gokulpeth
2.	<i>Brassica oleracea var botrytis</i>	Cauliflower	<i>Fusarium</i> , <i>Alternaria brassicola</i> , <i>Botrytis cinerea</i>	Gokulpeth, Cotton Market, Sakkardara
3.	<i>Capsicum frutescens</i>	Chilli	<i>Alternaria solani</i>	Sakkardara, Gokulpeth, Cotton Market
4.	<i>Dacus carota</i>	Carrot	<i>Mucor</i> , <i>Alternaria dauci</i> , <i>Rhizopus</i> , <i>Aspergillus</i> ,	Cotton market, Kalmana, Sakkardara, Gokulpeth
5.	<i>Dolichos lablab var lignosus</i>	Field bean	<i>Aspergillus</i> sp., <i>Phythem</i> sp.	Sakkardara, Kalamana, Cotton market
6.	<i>Dolichos lablab var typicus</i>	Indian butter bean	<i>Phythem</i> sp. <i>Fusarium</i> , <i>Alternaria</i> , <i>Aspergillus</i>	Cotton market, Kalamana, Gokulpeth
7.	<i>Lycopersicum esculantum</i>	Tomato	<i>Alternaria solani</i>	Sakkardara, Gokulpeth, Cotton market
8.	<i>Pisum sativum</i>	Pea	<i>Fusarium</i> , <i>Alternaria</i> , <i>Pernospora viciae</i> , <i>Ascochyta pinoides</i> , <i>Erysiphe</i> sp.	Gokulpeth, Cotton market, Sakkardara, Itwari
9.	<i>Solanum melongena</i>	Brinjal	<i>Alternaria</i> , <i>Botrytis cinerea</i> , <i>Phoma lycopersici</i>	Sakkardara, Cotton market, Kalamana
10.	<i>Solanum tuberosum</i>	Potato	<i>Fusarium</i>	Itwari, Sakkardara, Kalamana, Gokulpeth
11.	<i>Achras sapota L</i>	Sapota	<i>Rhizopus</i>	Fruit market, Sakkardara, Itwari
12.	<i>Citrus aurantifolia</i>	Lemon	<i>Penicillium digitatum</i>	Sakkardara, Cotton market, Gokulpeth
13.	<i>Citrus sinensis</i>	Sweet orange	<i>Penicillium digitatum</i>	Fruit market, Sakkardara
14.	<i>Citrus reticulata</i>	Orange	<i>Penicillium digitatum</i>	Cotton market, Fruit market
15.	<i>Zizipus mauritiana</i>	Indian jujube	<i>Aspergillus</i>	Sakkardara, Cotton market
16.	<i>Vitis vinifera</i>	Grapes	<i>Aspergillus niger</i> , <i>Penicillium</i> sp. <i>Rhizopus stolonifer</i> , <i>Botrytis cinerea</i>	Sakkardara, Fruit market, Itwari
17.	<i>Musa paradisiaca</i>	Banana	<i>Colletotrichum musae</i> , <i>Verticillium theobromae</i> , <i>Rhizopus stolonifer</i>	Cotton market, fruit market,

The present investigation revealed that fungal infection is mainly due to injury during storage and handling. Species of *Fusarium*, *Alternaria* and *Aspergillus* were found to be the disease causing organisms responsible for extensive damage to fruits and vegetables in the markets of Nagpur region. The fungi like *Aspergillus*, *Fusarium*, *Rhizopus*, *Mucor* and *Penicillium* species were found on edible fruits which may causes allergenic effects on human health. *Aspergillus*, *Penicillium*, *Rhizopus* and *Mucor* are found very dominant pathogens on fruits and vegetables. The optimum temperature and humidity are the main factor for the infection of fungus.

CONCLUSION

These fungi were most prevalent in the air of market environment and also found to be responsible for most of the decay of the vegetables and fruits during storage. Hence, there is probably a cyclic relationship existing between the prevalence of fungal bioaerosols and spoilage of diseases in environments.

The earlier results have emphasized that efforts should be made to adopt improved packaging techniques, cushioning material and cold storage facilities at the retail level. A number of physical and chemical treatments have been evaluated for controlling post-harvest diseases. The physical treatment includes heat therapy, low temperature storage and radiation, while chemical treatment includes the use of chemical agents like antibiotics, growth regulators, fungicides, oils, chemicals and vapors emitting compounds.

Maintaining hygienic condition in the market can help to minimize the post-harvest diseases. Burning of trash; proper disposal of fruits and vegetables would not only help to maintain hygienic conditions, but also will help to minimize bio-aerosol inoculums.

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