POST HARVEST DECAY OF AVERRHOA CARAMBOLA L. AND PHYLLANTHUS EMBLICA L. DUE TO SOME MICROFUNGI

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KEYWORDS
Decay
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Averrhoa carambola L. and Phyllanthus emblica L. (Syn. Emblica officinalis Gaertn.) are two important fruits having medicinal and nutritive value cultivated in Assam. A total of 24 fruit samples of Averrhoa carambola L. and 40 fruit samples of Phyllanthus emblica L. were randomly collected from the different markets of Guwahati city (Assam) from July, 2011 to September, 2012. A total of 16 different micro fungi belonging to 7 different genera were isolated and identified which were responsible for the post harvest decay of two fruits. Aspergillus flavus and A. niger were predominant pathogens in Averrhoa carambola L. and A. niger and Penicillium citrinum were predominant in case of Phyllanthus emblica L. respectively.

ABSTRACT

Fruits are the rich sources of vitamins and minerals which are urgent need for the good health of human. Post harvest diseases destroy 10-30% of the total yield of crops and in some perishable; especially in developing countries, they destroy more than 30% of the crop yield (Kader, 2002). Fruits contain high levels of sugars and nutrient elements and their low pH value make them susceptible for fungal attack and are being rotted (Singh and Sharma, 2007). Fungi not only blemish or cause rot to a number of fruits but also reduce their market value (Arya, 2004). Post harvest fungal diseases of some fruits were reported by Rathod (2010). The post harvest fruits are mainly contaminated with fungi during the transportation and storage. Fatima et al. (2009) reported post harvest deterioration of fresh fruits and vegetables. The injured fruits are more prone to fungal infection. The fruit of Averrhoa carambola L. and Phyllanthus emblica L. are two important nutritive fruits. Averrhoa carambola L. is commonly known as “kordoitenga” in Assam and also as “star fruit”. The fruit is eaten raw or cooked with sugar. Chutney, jellies, jam, pickles etc. are prepared from the fruit. Fruit juice is prescribed in jaundice, for curing urinary trouble, high blood pressure, hypertension etc. Phyllanthus emblica L. commonly known as “amlokhi” and also as Indian gooseberry is a rich source of Vit-c. It is cooling, refrigerant, diuretic and laxative. Dried fruits are known for its use in haemorrhages, diarrhoea, dysentery, anaemia, jaundice and cough. The fruits are used to prepare hair wash and hair oil for good appearance and growth of hair. It is also an ingredient of Trifola and Chyavanprash. Fungi not only decay, deteriorate and reduce the commercial value of fruit but there are also reports of mycotoxin production by fungi which has been serious concern for human health (Philips, 1984; Moss, 2002). The present investigation deals with the isolation and identification of the fungi associated with the two fruits available in the markets of Guwahati city of Assam.

INTRODUCTION

In the year 2011, July- September 2012, Averrhoa carambola L. and Phyllanthus emblica L. fruits were collected from the different markets of Guwahati City. A total of 24 fruit samples of Averrhoa carambola L. and 40 fruit samples of Phyllanthus emblica L. were collected, stored in polythene bags, labelled and brought to the laboratory. In case of heavily infected fruits, the infected portion were separately cut with sterile knife and brought to the laboratory in sterile bottles. The symptoms of infected fruits were studied and the specimens were kept in moist chamber using bell jar. Rotten specimens were kept under refrigeration at (10±1)°C to prevent further deterioration. In certain case nichrome wire/ needle duly sterilized were used and the pathogen was transferred directly to Potato dextrose agar (PDA) media and Czepack dox agar media. In some cases the infected tissue was cut and after surface sterilization with 0.1% HgCl₂ in sterile distilled water followed by change in sterile distilled water and then transferred directly to the media. The petridishes were incubated for 5-7 days at (28±1)°C. Fungal isolates were identified
RESULTS AND DISCUSSION

Microfungi isolated from fruit of Averrhoa carambola L. were identified as Alternaria alternata, A. tenuissima, Aspergillus flavus, A. niger, A. terreus, Colletotrichum gloeosporioides, Fusarium oxysporum, Leptothorium sp, Penicillium citrinum and Rhizopus stolonifer and the microfungi isolated from the fruit of Phyllanthus emblica L. were identified as Aspergillus flavus, A. fumigatus, A. niger, A. parasiticus, Fusarium moniliforme, F. oxysporum, Penicillium citrinum, P. islandicum, P. italicum, Rhizopus nigricans and R. stolonifer. The fungal species common to both the fruits were Aspergillus flavus, A. niger, Fusarium oxysporum, Penicillium citrinum and Rhizopus stolonifer. On Averrhoa carambola L. discolouration of fruit with black lesions on the surface, dark brown spots turning to soft watery black rot were observed. In case of Phyllanthus emblica L. small black circular spots, brown necrotic lesions on fruit and rotted fruit were prominent. The percentage of frequency of individual fungus was calculated by the following formula (Giridher and Ready, 1997).

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\text{No. of observations in which a Sp appeared} \times 100 \\
\text{Total no. of observations}
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The frequency (%) of the fungal species on Averrhoa carambola L. fruit and Phyllanthus emblica L. fruit are shown in Fig.1 and Fig. 2.

Pathogenecity tests revealed that all the microfungi isolated were not equally efficient in causing rot of the fruit of Averrhoa carambola L. and Phyllanthus emblica L. (Table 1 and 2). Aspergillus flavus and A. niger were found dominant in Averrhoa carambola L. fruit. Aspergillus niger and Penicillium citrinum were found dominant in Phyllanthus emblica L. fruit. The present investigation revealed the presence of Aspergillus niger responsible for Aspergillus rot of Phyllanthus emblica L. (Fatima et al., 2009). Fungal contamination of stored herbil fruit samples were reported by Gautam et al. (2009). The presence of Colletotrichum gloeosporioides and Leptothorium sp can be co-related with the findings of Cherian (2002). Pathogenic fungi can even cause infections or allergies which were reported by Monso (2004). In this context, the present investigation deals with the microfungi associated with Averrhoa carambola L. and Phyllanthus emblica L. fruits, so that proper management steps can be taken to pave the way for minimizing the rate of incidence of decay of both these important fruits.

REFERENCES


