ISSN: 0975-833X

Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 9, Issue, 07, pp.53465-53466, July, 2017

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

RESEARCH ARTICLE

ISOLATION AND CHARACTERIZATION OF *PENICILLIUM* SPS. FROM CITRUS

***Nishat U. Shaikh and Ashok M. Chavan**

Seed Health and Fungal Biotechnology Laboratory, Department of Botany, Dr. Babasaheb Ambedkar Marathwada University, Aurangabad (MS)

ARTICLE INFO

Article History:
Received 17th April, 2017
Received in revised form
25th May, 2017
Accepted 05th June, 2017
Published online 22nd July, 2017

Key words:

Penicillium sps,
Mycotoxins,
Potato Dextrose Agar (PDA).

ABSTRACT

Fruits make important diet for human beings. The high concentration of various sugars, minerals, vitamins and amino acids also provide a good platform for the successful growth and survival of various parasitic and saprophytic forms of fungi. Fruits are highly perishable and maintain an active metabolism during the storage phase. During post harvest period diseases can affect the quality of fruits. Post harvest deterioration of fruits may take place in any stages. *Penicillium* is a diverse genus occurring worldwide and its species play important roles as decomposers of organic materials and cause destructive rolls in the food industry where they produce a wide range of mycotoxins. Other species are considered enzyme factories or are common indoor air allergens. In the present study, an investigation was carried out to study the *Penicillium* sps. from Citrus fruits. Samples were plated on potato dextrose agar (PDA) medium and incubated at 26± 2^0C. Resulting growth screened microscopically for *Penicillium* sps. Twenty eight different isolates belonging to 6 species was isolated and identified from lemon, orange and citrus fruits. *Penicillium camemberti, P. italicum, P. expansum, P. digitatum, P. glaucum* and *P. citrinum* were isolated from all the citrus fruits.

Citation: Nishat U. Shaikh and Ashok M. Chavan, 2017. "Isolation and characterization of *Penicillium* sps. from citrus", *International Journal of Current Research*, 9, (07), 53465-53466.

INTRODUCTION

Microorganisms are associated, in a variety of ways with all the food we eat. They may influence the quality availability, and quantity of our food. Naturally occurring foods such as fruits and vegetables normally contain some microorganisms and may be contaminated with additional organisms during handling. The ripened fruits are infected easily while the green ones show instance to infection due to the following reasons: green fruits don't meet the nutritional requirements of the fungus; the enzyme potential necessary for invading green fruits is greater than for ripe ones and is temporarily beyond the capability of the fungus; and some toxins present in the green fruits disappear or become inactive in the ripe ones. Citrus is one of the most important winter fruit crops of the world and has grown commercially in more than 100 countries across six continents (Terol *et al.,* 2007). It contains so many biochemical constituents which is beneficial for human health, wealth and for growth. Huge economic losses occur throughout the world due to post harvest diseases and are frequently reduced by fungal pathogens attack (Liu *et al.,* 2007) which reduces the shelf life of fruits. Mold growth in citrus fruit leads to the production of the hazardous mycotoxins, such infected fruits are not good for human consumption (Moss, 2008). By considering the importance of these problems present study aimed to isolate and identify the *Penicillium* sps associated with citrus fruits.

***Corresponding author:* Nishat U. Shaikh,**
Seed Health and Fungal Biotechnology Laboratory, Department of Botany, Dr. Babasaheb Ambedkar Marathwada University, Aurangabad (MS)

MATERIALS AND METHODS

Collection of samples

Samples of lemon, orange and sweet lime were collected from different market places, store houses and from different fields of Aurangabad region and bring into the laboratory for further process.

Isolation of pathogens

The infected parts of all the citrus fruits was inoculated on PDA (Potato dextrose agar) medium in aseptic condition and allowed for incubation at 26±2^{0}C for six days. Individual colonies were further subcultured on separate plates and maintain the pure culture on PDA slants.

Identification of pathogens

Identification of pathogens was done by microscopic observations, on the basis of growth pattern, colony color,

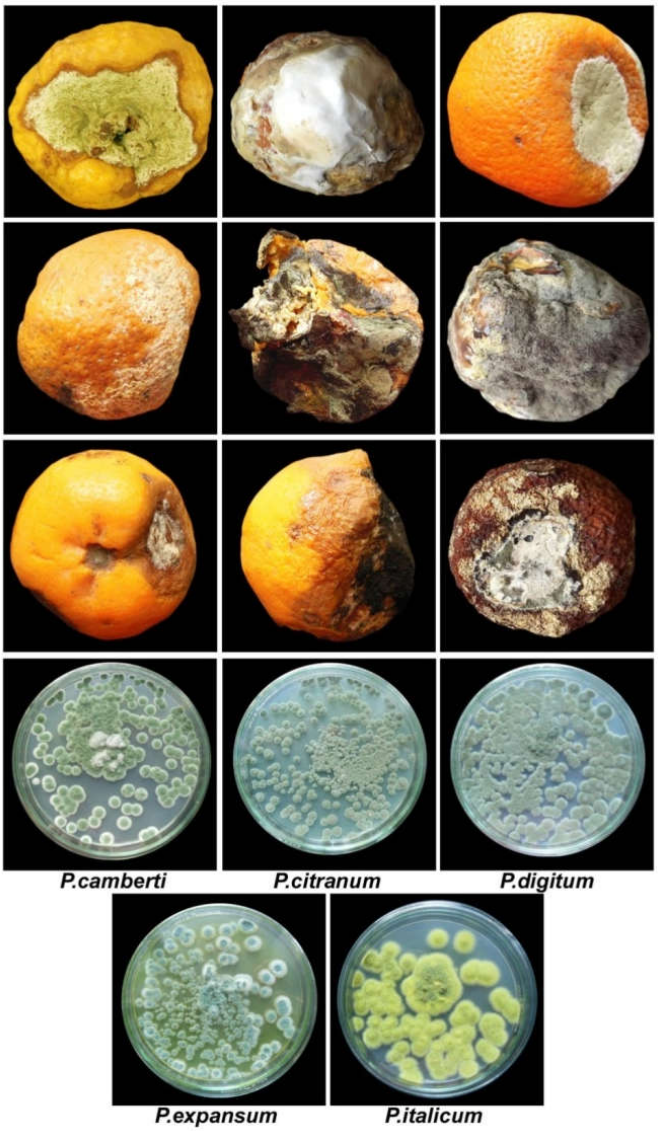
sporulation and pigmentation by using standard journals and fungal taxonomic keys.

RESULTS AND DISCUSSION

All the Citrus fruits were highly affected by deteriorative fungal genera *Penicillium*. In the present study ripened fruits of lemon, orange and sweet lime were observed to be an affected with different *penicillium* sps. Twenty eight isolates of different *Penicillium* sps belonging to six different species were isolated from infected samples of lemon, orange and sweet lime fruits.

Table:- Occurrence of Different *Penicilium* sps on citrus fruits

S.No.	Name of Fungi	Name of citrus fruits		
		Lemon	Orange	Sweet lime
1	*Penicilliumcamemberti*	++	+++	+
2	*P. italicum*	++	+++	+++
3	*P. expansum*	+++	+	+++
4	*P. digitatum*	+	+++	+
5	*P. glaucum*	--	++	+++
6	*P. citrinum*	+	++	+++



Fruits of orange and sweet limes were more affected than lemon. Eight isolates of *Penicillium italicum* were isolated from these fruits whereas *Penicillium expansum* have six, *Penicilliu mcitrinum* had seven, *Penicillium camemberty* had three, *Penicillium digitatum* and *Penicilium glaucum* had two isolates each. *Penicillium italicum* shows highest percentage of occurrence on all the fruits followed by *Penicillium expansum* and *Penicillium citrinum;* similar type of results was recorded by (Akhtar *et al*., 2013), they isolated and identified *Penicillium italicum* and *Penicillium citrinum* from citrus fruits. *Penicillium expansum* was isolated and characterized from apple fruits also (Vico *et al*., 2014). Sweet lime fruits shows highest incidence of all the *Penicillium* species as compare to orange and lemon fruits followed by orange fruits. All these *Penicillium* species were capable to produce variety of secondary metabolites to breakdown the inorganic forms of nutrient into organic form; which leads to reduce the quality of fruits. *Penicillium* sps were also very well known for the secretion of certain toxins into the substrates.

After the infection to fruits many species of *Penicillium* produces different enzymes, secondary metabolites and certain toxic substances to breakdown the food to get nourishment for their growth and development. Toxic substances produced during this process remains as it is and spoil the fruit, which in not safe for human consumption.

Conclusions

A citrus fruit like lemon, orange and sweet lime was highly infected by different *Penicillium* sps during improper storage conditions; those infected fruits were not good for human consumption as concern about their health. Proper storage and handling conditions were required for the ripened citrus fruits.

Acknowledgement

We are very much thankful to department of Botany for providing all the facilities to completion of present work. We also thankful to university grand commission for providing economical support in the form of junior research fellowship (Maulanaazad minority fellowship).

REFERENCES

AkhtarNosheen, TehminaAnjum and RashedaJabeen 2013. Isolation and Identification of Storage Fungi from Citrus Sampled from Major Growing areas of Punjab, Pakistan. *International Journal of Agriculture & Biology*, 15–6–1283–1288.

Liu, Q., J. Xu, Y.Z. Liu, X.L. Zhao, X.X. Deng, L.L. Guo and J.Q. Gu, 2007. A novel bud mutation that confers abnormal patterns of lycopene accumulation in sweet orange fruit (*Citrus sinensis*L. Osbeck). *J. Exp. Bot.,* 58: 4161–4171.

Moss, M.O. 2008. Fungi, quality and safety issues in fresh fruits and vegetables. *J. Appl. Microbiol.,* 104: 1239–1243

Terol, J., A. Conesa, J.M. Colmenero, M. Cercos, F. Tadeo, J. Agusti, E. Alos, F. Andres, G. Soler, J. Brumos, D.J. Iglesias, S. Gotz, F. Leqaz, X. Argout, B. Courtois, P. Ollitrault, C. Dossat, P.Wincker, R. Morillon and M. Talon 2007. Analysis of 13000 unique *Citrus* clusters associated with fruit quality, production and salinity tolerance. *BMC Genomics,* 8: 31.

VicoIvana, NatasaDuduk, MiljanVasic and MilicaNikolic 2014. Identification of *Penicilliumexpansum*causing postharvest blue mold decay of apple fruit. Pestic. Phytomed. (Belgrade), 29(4), 257–266.

****