



---

## Assessment of post harvest mycoflora from stored mango fruits

Sumia Fatima and Mumtaz Baig

Dr. Rafiq Zakaria College for Women, Aurangabad-431002 (M.S.) India.

---

### Abstract

It is one of the national fruit of India. Mangoes are extensively produced in India. It is cultivated in India since 6000 years back. In India it is called by various names in various languages. India is the world's largest producer of mango. Mango is grown in almost all states of India. The maturity of fruit has been considered on the basis of physical characteristic such as colour, size, and shape. At present mango trees are cultivated in about 87 countries of the world reported by Prakash and Srivastava, (1987). There are many plant pathogenic organisms such as bacteria, fungi which causes different types of diseases of fruits during storage periods and symptoms caused due to fungal diseases vary greatly that depend on type of pathogen, host (fruit) and environmental factors. The symptomatology of post – harvest rots diseases mango discussed here.

Heavy loss of harvested fruits of mango caused due to fungal, bacterial and physiological aspects. There is much fungal form responsible for storage rot of mangoes which directly affect the economy of the country.

The loss of fruits after harvest is a major problem of fruit growing countries of the world. There are reports of losses of millions of rupees annually due to post-harvest diseases caused by different types of mycoflora during storage periods. it is very essential to have knowledge of pathogenic organism associated with fruits during storage periods. The aim of study of fruit diseases of market is to develop perfect disease management strategies that are economically significant. The diseases cause different types of symptoms and biochemical change due to which fruit becomes unfit for consumption.

Fruits selected for study is Mango. The mycoflora from stored fruits was isolated from stored fruits by food poisoning technique on P.D.A. (Potato Dextrose Agar) medium. The pathogenicity was tested according to Koch's postulates. There was variation in the mycoflora according to the type of fruit. The common fungi were *Colletotrichum capsici*, *Fusarium semitectum*, *Alternaria alternata*, *Aspergillus flavus*, *Aspergillus niger*, *Cladosporium oxysporium* and *Curvularia lunata*

**Key words:** Stored mango, isolation of mycoflora.

---

### Introduction:

It is the fruit which is called as king of fruit. it is originated from India. It occurs throughout the India in wild and cultivated form. It is mentioned in oldest literature of India like Vedas. Mango cultivars are

grown in India about more than 6000 years back. It has been established in since a very early stage. The armies of Great Alexander found it established in the Indus valley in 327 BC. At present mango trees are cultivated in about 87 countries of the



world reported by Prakash and Srivastava, (1987). In India it occupies 70 percent of the area of the total areas of fruits. India ranks first in production of mango. Total annual production estimated about 8.21 million tones. All the states of India grow mango trees for its delicious fruits. The area's growing mango as a major fruit crop are Uttar Pradesh, Bihar, Andhra Pradesh, Maharashtra, Gujrat, Orissa, West Bengal, Tamil Nadu, Kerala. The post-harvest losses of fresh mango fruits are reported to be 25 - 40% in India and 69% in Pakistan; and microbial decay accounts for 17.0 - 26.9% of the total post-harvest losses in Asian countries (Prabakar et al., 2005). All the parts of mango fruit are edible. Besides pulp, the kernel which occurs inside the stone is boiled and eaten roasted. Mango contains 20% protein, it-C and fibres. It is considered to have medicinal properties (Samb,2007).

Different types of fungi are found to be associated with mango during storage which are responsible for post-harvest diseases of fungi. A citrus fruit and sweet orange infected by *Penicillium italicum* (Narayanasamy, 2005). The lesions formed by *Penicillium*-induced moulds (Sommer and Ewards, 1992). The fungus *Aspergillus niger* was found to be associated with rot of mango. Sumia, et. al, (2006) reported *Colletotrichum* rot of mango by caused by *Colletotrichum capsici*. 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 fruits in market. Post – harvest loss of fruits may be due to susceptibility of fruits to the fungal growth.

**Material and Method:** The mango (*Mangifera indica* Linn.), fruits were collected from different fruit markets of Aurangabad. A separate polyethylene bag was used for each type of infected fruit in all cases. The post harvest fungi causing post harvest diseases of fruit was isolated on PDA (Potato Dextrose Agar) medium by inoculating small piece of infected region of fruit on PDA (Potato Dextrose Agar) medium amended petriplates in sterile condition. The inoculated petriplates were incubated at room temperature  $24 \pm 1$  °C. The fungus was purified by repeated re-inoculation on PDA medium for several times to get complete contamination free pure culture. The pathogenicity of the each isolate was studied according to Koch's postulates. A 4mm disc of pure culture of fungal colony was inoculated on healthy fruit at the region of superficial puncture made artificially with sterile needle in sterile condition. A set of five fruits were used to confirm pathogenicity of each type of fungal isolate. The same procedure was repeated for each type of fungal isolate. Different types of fungi isolated from stored mango fruits were listed in table.

**Table: The fungi associated with stored Mango (*Mangifera indica* Linn.)**

Sr.no.	Fruit	Fungi associated with stored Mango
1.	Mango ( <i>Mangifera indica</i> )	<i>Alternaria tenuissima</i> ; <i>Pestalotia mangiferae</i> ; <i>Actinodocium jenkinsii</i> , <i>Colletotrichum gloriosporiodes</i> ; <i>C. capsici</i> , <i>Boothiella tetraspora</i> ;



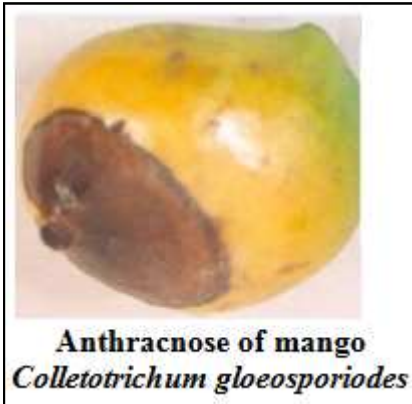
	<i>Linn.</i> )	<i>Rhizopus arrhizus; Pstaliopsis glandicola;; Phoma multirostrata ; Botryodiplodia theobromae; Colletotrichum mangiferae; Sclerotium rolfsii; Aspergillus niger; Cladosporium herbarum, Pennicilium sp. Sclerotium rolfsii; Phytophthora arecae, Sphaceloma mangiferae.</i>
--	----------------	--

### Results And Discussion:

There were about 38 fungal isolates were isolated from mango fruits .The post harvest fungi associated with mature mango fruits during storage period. *Alternaria tenuissima ; Pestalotia mangiferae; Actinodocium jenkinsii, Colletotrichum gloriosporiodes; C. capsici, Boothiella tetraspora; Rhizopus arrhizus; Pstaliopsis glandicola;; Phoma multirostrata ; Botryodiplodia theobromae; Colletotrichum mangiferae; Sclerotium rolfsii; Aspergillus niger; Cladosporium herbarum, Pennicilium sp. Sclerotium rolfsii; Phytophthora arecae, Sphaceloma and mangiferae.* After harvest, mangoes are susceptible to infection by several fungi such as *A. flavus*, *A. niger*, and *Penicillium spp.* Artificial infection studies have shown that fruits are susceptible to infection at all stages of ripeness (Palejwala et al., 1987). Transportation of unpacked fruits causes about 60% loss of fruits due to skin injuries observed in mango fruits. (Bhale, 2011). The development of alternative postharvest disease control options using either microbial agents (Conway et al., 1999; El-Ghaouth et al., 2000; Korsten et al., 2000; Janisiewicz and Korsten, 2002; Pang et al., 2002; Ismail and Zhang, 2004) or natural plant products (Kubo and Nakanishi, 1979; Dixit et al., 1995; Wilson et al., 1997; Obagwu and Korsten, 2003) have become more important as successful

commercial applications have gained ground. Biopesticides (microbial agents and natural plant materials) have the potential to be more environmentally safe and more acceptable by the general public for human use. To find out correct control measure strategies it very essential to know the type of post-harvest fungi associated with fruits. Careful handling of fruits can avoid post-harvest losses at maximum extent.

**Conclusion:** In conclusion, it is important to point out that mango fruits are sensitive to physical damage. Efforts should be made, therefore, during harvesting and handling to minimize wounding and mechanical injuries. Int his way, the shelf life of mango fruits can be prolonged a little more and so, make them more available at least during the season. Further, In addition, field sanitation should be maintained to minimize the load of inoculum that may be carried from the field into storage. This will reduce the incidence of postharvest spoilage of the fruit.



**Reference:**

1. Bagwan, N.B., (2010) .Post-harvest pathogens of mango (*Mangifera indica*) and their effect on fruits quality, *J. Mycol. Pl. Pathol.*40:352-355.
2. Bhale, U. N., (2011). Survey of market storage diseases of some important fruits of Osmannabad District (M. S.) India, *Science Research Reporter* 1(2):88 -91, Sept. 2011 ISSN: 2249 – 2321.
3. Castoria R, de Curtis F, Lima G, Caputo L, Pacifico S & de Cicco V (2001) *Aureobasidium pullulans* (LS-30), an antagonist of postharvest pathogens of fruits: study on its mode of action. *Postharvest Biology and Technology* **32**, 717–724.
4. Chadha, KL (2000) Pre- and Post- harvest technology of fruit and vegetables. *In: National workshop on opportunities and challenges in fruit and vegetable processing industry.* Oct. 13-14, 2000, CFTRI, Mysore, India.
5. Chalutz, E. & Wilson, C.L., (1990) Postharvest biocontrol of green and blue mold and sour rot of citrus fruit by *Debaryomyces hansenii*. *Plant Disease* **74**, 134–137.
6. Chalutz, E., Ben-Arie, R., Droby, S., Cohen, L., Weiss, B. & Wilson, C.L. (1988) Yeasts as biocontrol agents of postharvest diseases of fruit. *Phytoparasitica* **16**, 69–75.
7. Janisiewicz, W.J., 1985. Biological control of postharvest disease of pome fruits. *Phytopathology* 77, 481-485.
8. Palejwala VA, Patki CK, Bhatt, SV, Modi VV (1987). Post-harvest spoilage of mangoes by *Aspergillus niger*. *Int. J. Food Microbiol.* 5:111-116.
9. Prabakar K, Raguchander T, Parthiban VK, Muthulakshmi P, Prakasam V (2005). Post harvest fungal spoilage in mango at different levels marketing. *Madras Agric. J.* 92(1-3):42-48.
10. Reddy, T. N., Chaturvedi, A and Babu, J. D. 2005. Screening of mango cultivars against important post-harvest diseases in Andhra Pradesh. *Journal of Research ANGRAU.* 33(3): 71-73.
11. Sommer, N.F., Ewards, D., 1992. Postharvest disease of selected commodities 15, 117-166.